# Fatigue for Cargo and On-Demand Ops
# Event Q&A

## Introducing these questions and answers.....

These Event Q&A are about the subject of "Fatigue for Cargo and On-Demand Operations" from the EASA Together4Safety Webinar that was held on 15 March 2021. Continue to follow the discussion on our Conversation Aviation LinkedIn Page or the EASA Air Ops Community


### How does the bio-mathematical model cope with long haul? My experience with different bio-mathematical models shows that these models struggle more with long haul, rather than short haul?

Experience shared for some years now among the industry on the use of bio-mathematical models shows that these tools need to be carefully implemented. Over-reliance on their results may give a false sense of control on the fatigue risks if these results are not validated by other sources of data. However, these bio-mathematical models can be very useful to assess and analyse the fatigue reports (post-analysis) or to compare duties between them (pre-analysis). Long haul seems not to be the problem. The problem seems to be more on operating as a non-spoke and hub operator but flying in circles and dateline crossings.

### How do you manage pilots' preferences day -to-day? Do you configure it in the system and your rostering/scheduling tool automatically creates the duty plan or is everything done manually?

At ASL Belgium Airlines, these preferences are still managed manually by the rostering/scheduling and crewing departments. Not all pilots have strict preferences on their duty patterns thanks to fatigue management. The system relies on a good comprehension of fatigue by these two departments mentioned above, and on a minimum flexibility of the crews.
The biomathematical model is part of the scheduling tool and will warn the scheduling staff if a warning level is exceeded.

### Any problem with commuting pilots? Should EASA regulate the commuting? For example, when no rest facilities are available before flight. How can this risk be mitigated from a regulation point of view?

The recommendation n°6 of the EASA study on "Effectiveness of Flight Time Limitation (FTL)" highlights the need for the operators to promote optimum use of sleep opportunities before reporting and during the night FDP. This is also a very effective mitigation measure for the pilots having a longer commuting time. There is currently no requirement in the regulation for such sleep facilities, but this may change in a future revision of the text taking into account the results of this study.

### Are there any already vaccinated crews? If yes, is there any consequences on rostering? Have you considered any rest prior to flight post any COVID vaccinations?

EASA has developed an SIB on Crew Vaccinations that provides operational guidance for operators on the subject of vaccinations and crew members.

### Is self-assessment used at flight operations level? Do you use KSS Karolinska Sleepiness Scale Matrix?

Self-assessment is part of the setup – crew members are allowed to overrule the biomathematical model – this happens especially as the biomathematical model might use a different sleeping pattern as the crew member.

### Did you succeed in managing individual duty pattern preferences? (multiple nights for younger pilots, on-off-on for older pilots)?

Yes, at ASL Airlines Belgium the system is managed manually by the rostering/scheduling and crewing departments. Pilots with sleep management issues can request to operate mainly on ON-OFF-ON or consecutive nights. This is probably the most effective mitigation measure set in place since the start of the implementation of our FRM.

### How do you think FRMS must be implemented in terms of limitations? Do you think companies without FRMS should be restricted in terms of maximum FTL and Duty times?

Within EASA rules, FRMS already now allows for certain extensions that non FRMS companies do not have.
In the current regulation, an approved FRM allows the operators to go beyond the basic limitations on the reduced rest and on flights in an unknown state of acclimatisation. The operators that have implemented the principles of FRM free themselves to use, all the time, the full flexibility of the regulation for managing fatigue and improving safety. For many years, ECA supports the idea that those operators who have genuinely implemented FRM should be rewarded by the regulation compared to the bad players. This would imply major changes in the regulation but could boost the implementation of FRM in the industry. Therefore, ECA would support additional restrictions of maximum FTL and Duty times for companies without FRM.

**What are the pre-requisites before implementing an FRM in an airline and how should these be assessed (internally and by the NCA)?**

Fatigue Management Guide for Airline Operations to be found on the internet.
To become truly effective an FRM requires a mature safety & reporting culture within the airline, the support from top management, and to be properly overseen by the national authorities. One critical way to ensure you have a safety and reporting culture is to conduct a survey by a third-party provider.

**Since CMS Data includes data pertaining to crew's psychological and physiological status, I believe it's worth noting how (1) crews would react to these data being collected, and (2) how this process is harmonized with the GDPR policies. The data collection as you foresee it (personal and "medical" data) would require a strong data protection commitment. What about the compliance with the current GDPR?**

Thales as a provider of CMS solution is adequately prepared through our corporate "Digital Identity and Security" Global Business Unit to secure our solution in compliance to GDPR.
Data that are acquired in experimental operations have been lead with scientific companies (CNRS laboratories), taking into account approved protocols from such personal protection committees.
Regarding the protection of individual data, individual agreement is managed and information on the proposed protocol is shared.
Non-Anonymous data are secured for a period-defined (3 to 5 years) and non-communicated. A secured management of the data with crypto techno of data is deployed. Data are not accessible outside of the stakeholders of the studies.

**How can you monitor the situational awareness and the stress? What is the methodology and or scale of the situational awareness?**

We are not working directly on the awareness situation but on the observation of behaviour adapted to the management of situational awareness through actions implemented and carried out by the crew during the flight. Regarding stress, Research activities are conducted on a dedicated model. We also work on mental workload and on perceptual motor models.

**How will you ensure that the devices that you are proposing to use for the crew monitoring are appropriately validated to ensure that the data collected is accurate and the device is sensitive enough to detect small changes?**

We develop our CMS hardware and software solutions through close reviews from specialized independent laboratories to validate our choices and the performance of our CMS.
Sensibility of our CMS technologies are tuneable to address the demand of the users (balance between false positive and false negative)

**While not challenging the benefit of CMS, it was surprising to hear that you consider "situation awareness" can be measured. What are the tangible elements you consider representative of "situation awareness"?**

SA is most complex, and no functional models are available today to use in our CMS
But, as exposed in previous answer, situational awareness can be managed by taking into account actions done by crew during a flight.

**How will the Thales system sensors be validated? Are there already any scientific papers available?**

All Sensors used by Thales on their CMS solutions are/will be validated through in-depth Scientific evaluations by independent specialized laboratories.

**When does the crew member put the sensor on? At home, on report for duty or when sitting in the aircraft?**

Our CMS solutions can cover all potential environments and settings, depending on the requirements of the user. Thales is aware of the potential benefit of prior night sleep monitoring for fatigue management (for instance) but also of the debatable acceptability of such monitoring.

**When using the fatigue model as part of an investigation into individual fatigue reports or other safety reports, how do you account for the individual factors that might make the results different from the 'average' fatigue predicted by the fatigue model?**

Thales is working on solutions that may be deployed from individual up to airlines levels. In that way, we will be able to separate individual usage from cockpit crew usage and address all levels of need. Furthermore Thales is also working on the robustness of our solutions to human inter variability to complement our efficiency on intravariability. Part of investigations should always include additional information requested to the crew members involved to validate models – this will allow to avoid generalizations.

**It is reassuring that the panelists strive for fatigue management in their operations and none mentions (primarily) compliance with existing FRM regulations. What does it mean to EASA?**

Cargolux is fully compliant with EASA FRM/FRMS rules. Compliance with Subpart-FTL is always the baseline.

**What was the main factor that inspired/motivated CARGOLUX to elevate their FRMS to such a major part of their SMS?**

FRM has a similar level within the SMS as most other issues. We saw the benefits to our operations, and it was a natural step to leverage the data and procedures available and not re-invent the wheel. -

**How did you assign the values to your level 1 and level 2 causes?**

The values assigned were defined based on the impact the different causes would have on risk. This will need to be done somehow qualitative and need input from different stake holders.

**Have you enabled the MoC and risk assessments prior those maximum FDP rotations and how long before the operation? Did you use the bio-mathematical model to assess "new" routes? Who has participated, flight ops & safety? Can you elaborate more on the FAT reports risk assessment, causes and correlation to the ERC matrix?**
**How do you relate the fatigue causes with the event escalation to the most credible accident scenario? This is, how does the crew member risk in experiencing an unacceptable fatigue risk with the aircraft accident risk?**

All new rotations are risk assessed by using different tools including the Biomathematical model. The responsibility for risk assessments is with the process owner, the safety department supports, advices and administers the process.
Different Causes are allocated a certain value / adding these values we come to a final score that we have matched to the ERC values / this allows to move from generic scores to ERC and integrate into ARMS.
(Last part of the question is not understandable)

**Do you take into consideration multicultural approaches in Human diversity FRM?**

No.

**Your fatigue report risk classification sounds very interesting. Have you been able to get granularity in your risk assessments? I.e. are you able to differentiate reports on risk severity?**

Yes – since Fatigue Reports get ERC values they can be integrated into ERC, hance they have a risk value.