

# Uses and Limitations of Biomathematical Fatigue Models

## - White Paper

This white paper has been provided by the IATA Fatigue Management Task Force (FMTF) as a guideline for the use and limitations of the biomathematical models.

### 1. The potential use of the models

Biomathematical models are an optional tool for fatigue hazard identification.

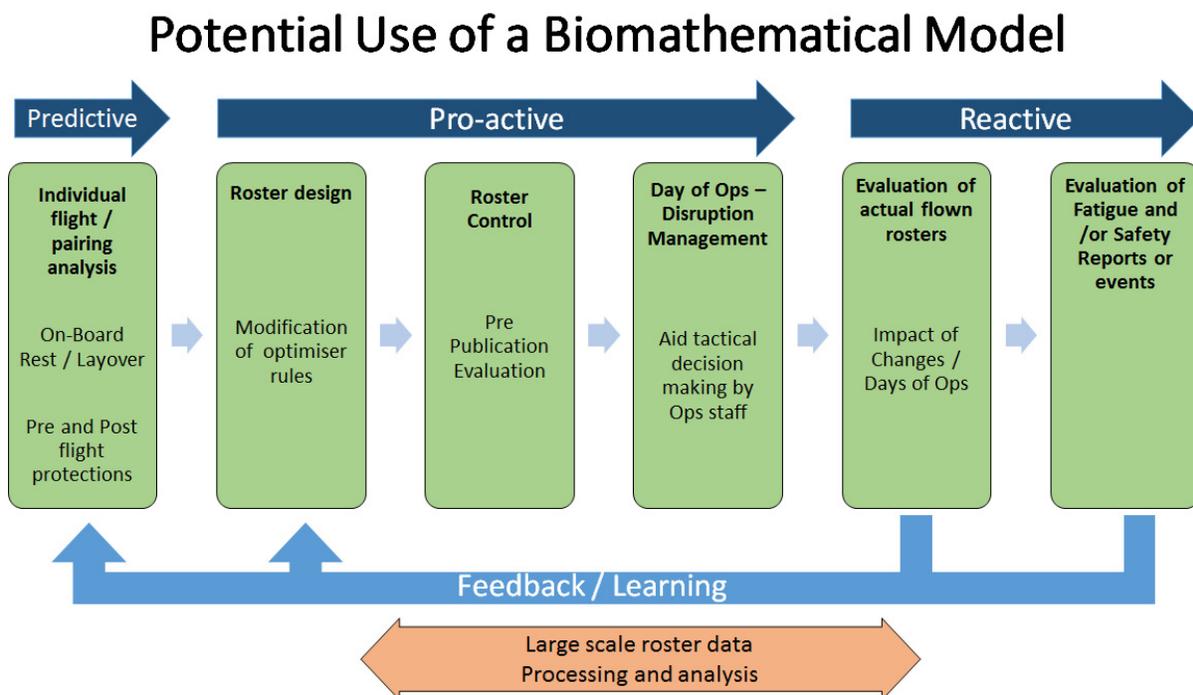


Figure 1: Potential usage of Biomathematical Model

- The output of the model provides metrics which can be used for relative comparisons of fatigue risks.
- This information can then be used to develop schedules and optimize pairings that promote alertness and mitigate fatigue-related risks.

## 2. Limitations of the models

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- A model is not an FRMS.
- An optimizer used in conjunction with a model does not constitute an FRMS.
- A model should not be used by individuals, operators or regulators as a go/no-go decision making tool.
- The output of a model does not necessarily correlate to a safety risk.
- Model outputs represent the population average and may not be accurate for specific individuals.
- Model sleep predictions may not reflect actual sleep which is fundamental to the validity of its output.
- Models may not take into account the operational context and mitigations.

## Conclusion

There are many factors that affect fatigue; modeling is only one part of the equation and should always be used in combination with other operational data and information that is available in order to assess fatigue risks.

Prior to selecting a model the FMTF recommends that an operator discuss fatigue risk management requirements with their Regulator and reads the additional reference documents listed below.

The FMTF is working towards improvement of model outputs through the creation of an international operational database to enhance sleep predictions, based on operator's data collection.

## References

IATA Summary of the CASA Biomathematical Fatigue Models Guidance Document, 2015

*IATA's Fatigue Safety Performance Indicators (SPIs): A Key Component of Proactive Fatigue Hazard Identification*

IATA/ICAO/IFALPA Fatigue Management Guide for Airline Operators, 2015