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Fatigue Risk Management & Challenges in Long Haul Cargo Operations

Cpt. Mattias Pak MSc. FRAeS
Vice President Aviation Safety

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Scope

Overview of Cargolux

Fatigue Reporting

Biomathematical Model

Data Analytics

Challenges

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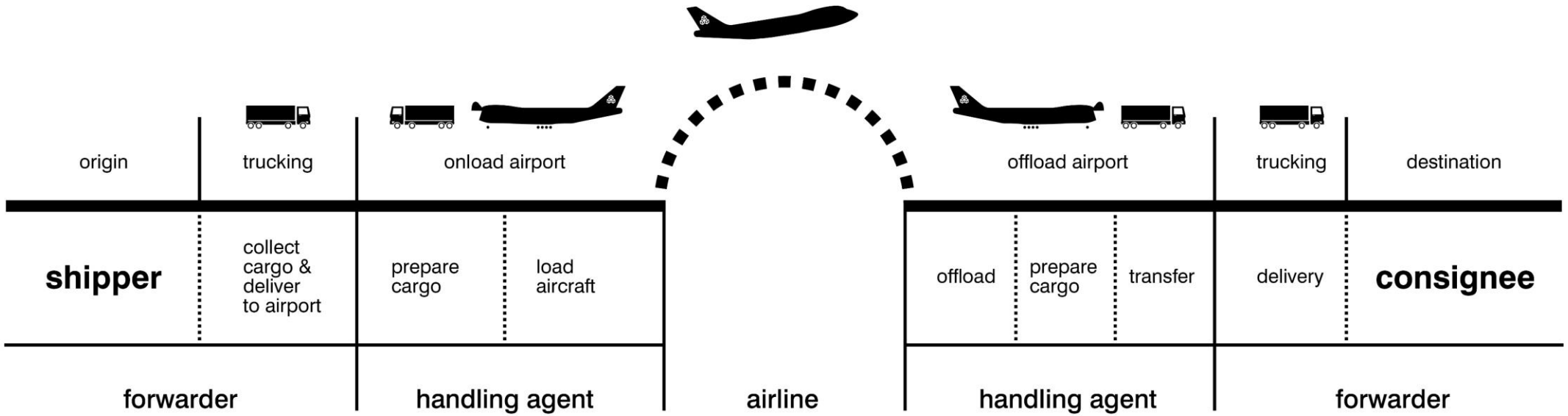
What is our role?



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Our Network

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FRM(S) Setup

Reporting

Biomathematical Model

Data Analytics

Challenges

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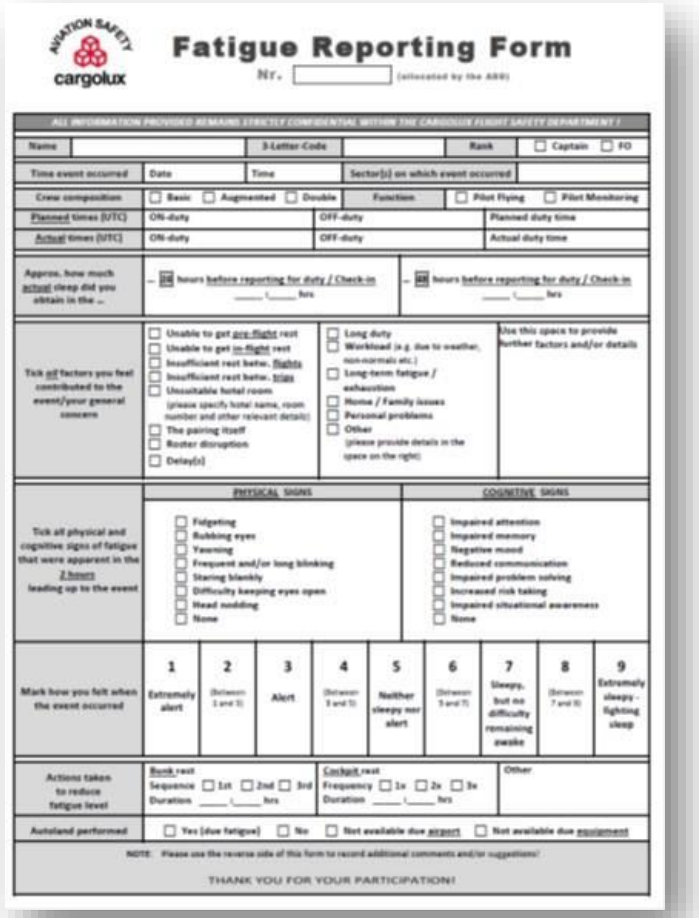
Reporting Summary



AVIATION SAFETY
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Fatigue Reporting Form

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- ☐ Home / Family issues
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- ☐ Other (please provide details in the space on the right)

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- ☐ Staring blankly
- ☐ Difficulty keeping eyes open
- ☐ Head nodding
- ☐ None

COGNITIVE SIGNS
- ☐ Impaired attention
- ☐ Impaired memory
- ☐ Negative mood
- ☐ Reduced communication
- ☐ Impaired problem solving
- ☐ Increased risk taking
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- Classification and Risk Assessment
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- Data integration into Safety Analytics Platform
- Use of gained Safety Intelligence

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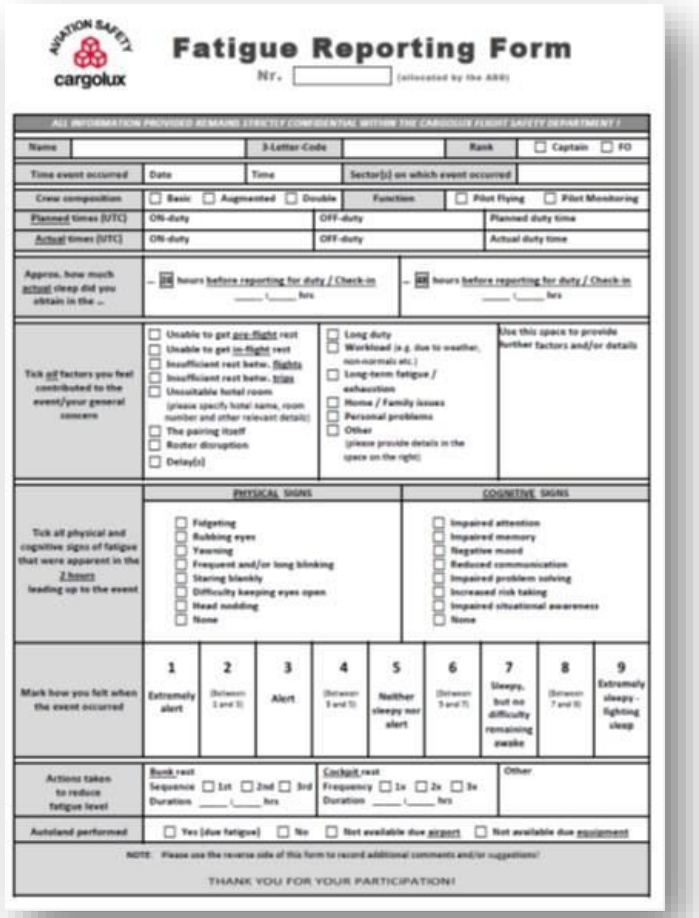

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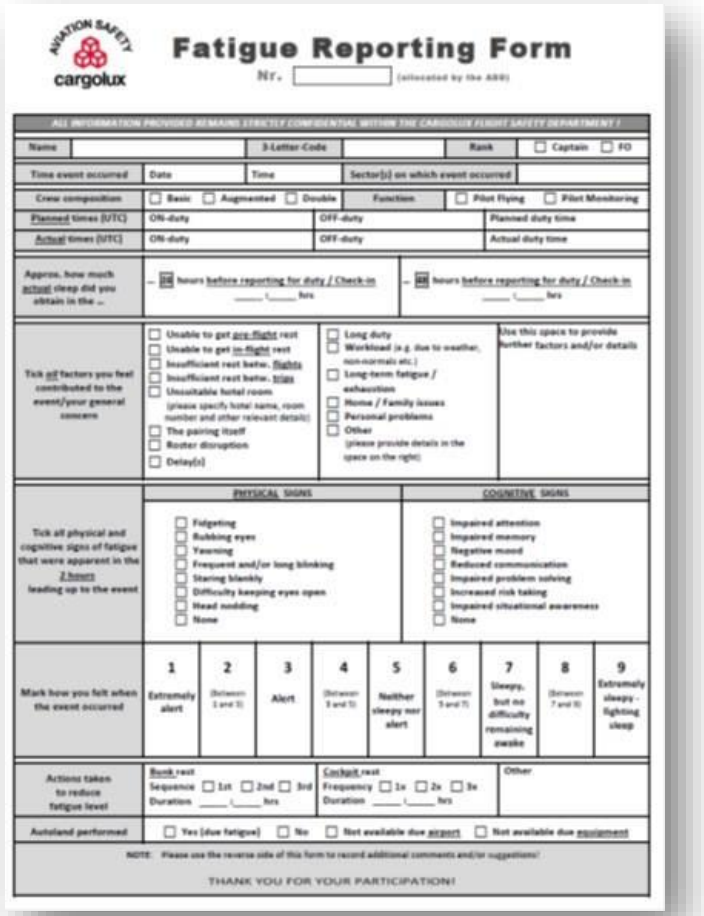

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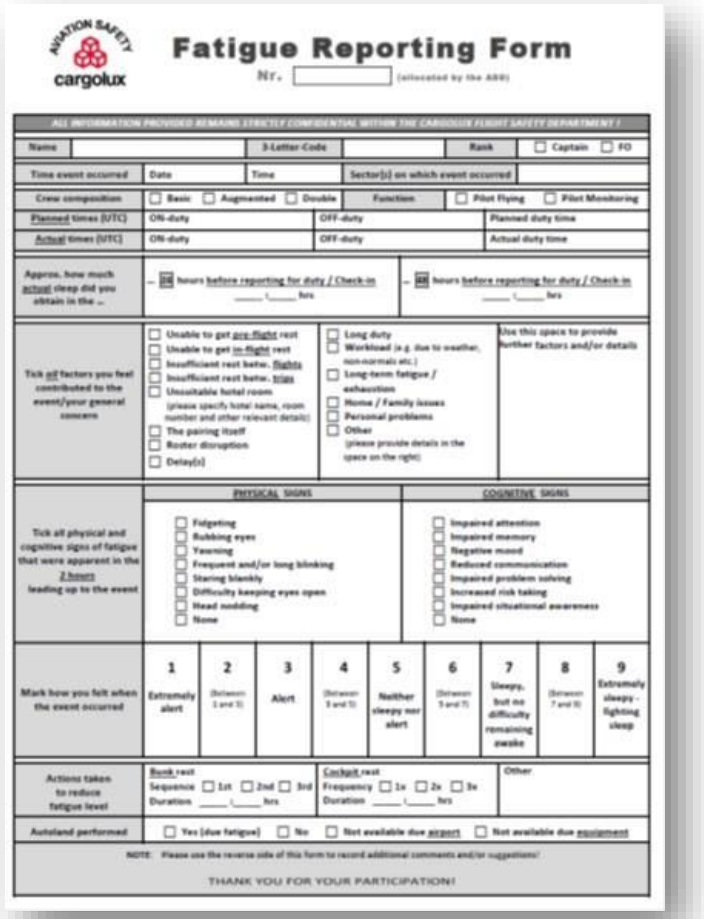

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Classification

Duty - Long Duty	Single Long Duty
	Consecutive Long Duties
Duty - Night Duty	Single Night Duty
	Consecutive Night Duties
Duty - All crew affected simultaneously	
Duty - Basic crew night duty >10h	Single Basic Crew Night Duty > 10h
	Consecutive Basic Crew Night duty > 10h
Rest - Insufficient Rest	Rest between Flights
	Rest between Trips
Rest - +/- 24h Rest	Single 24h Rest
	Consecutive 24h Rests
Rest - Minimum Rest	Single Minimum Rest
	Consecutive Minimum Rest

(Examples)

Total of 21 Level 1 Causes

Divided into +/-50 Level 2 Causes

Each Cause has a Value

Addition of Values result in a RISK Value

Value has an equivalent for Event Risk Classification in ARMS

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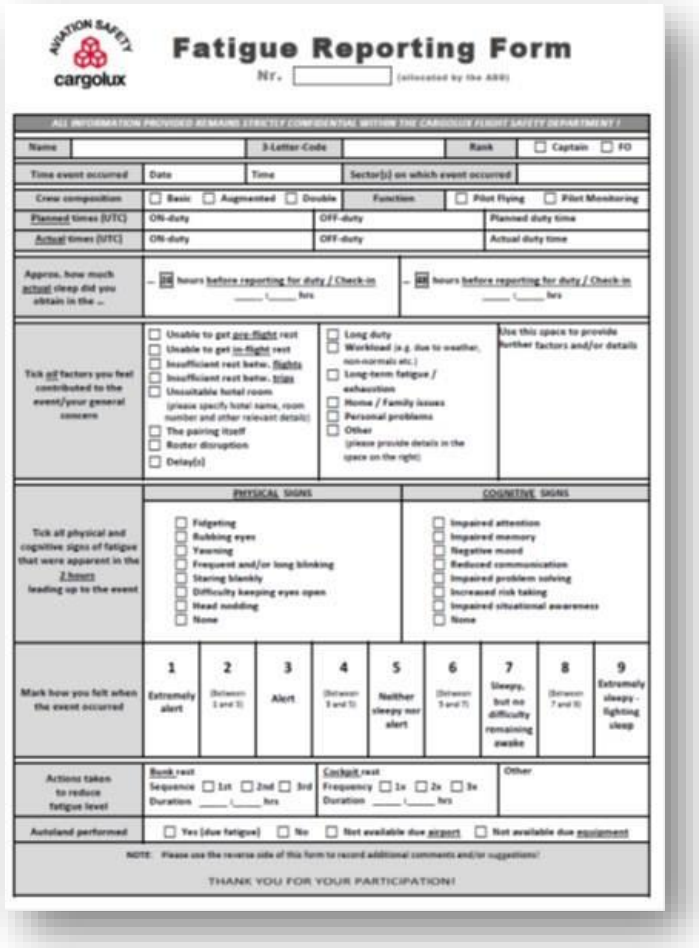
Reporting Summary



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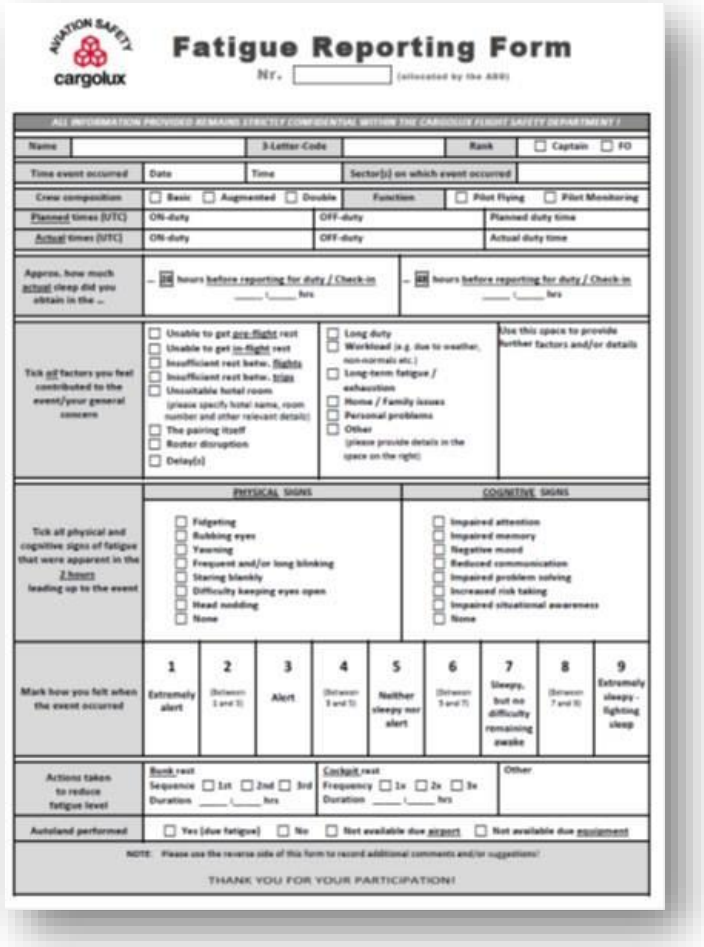

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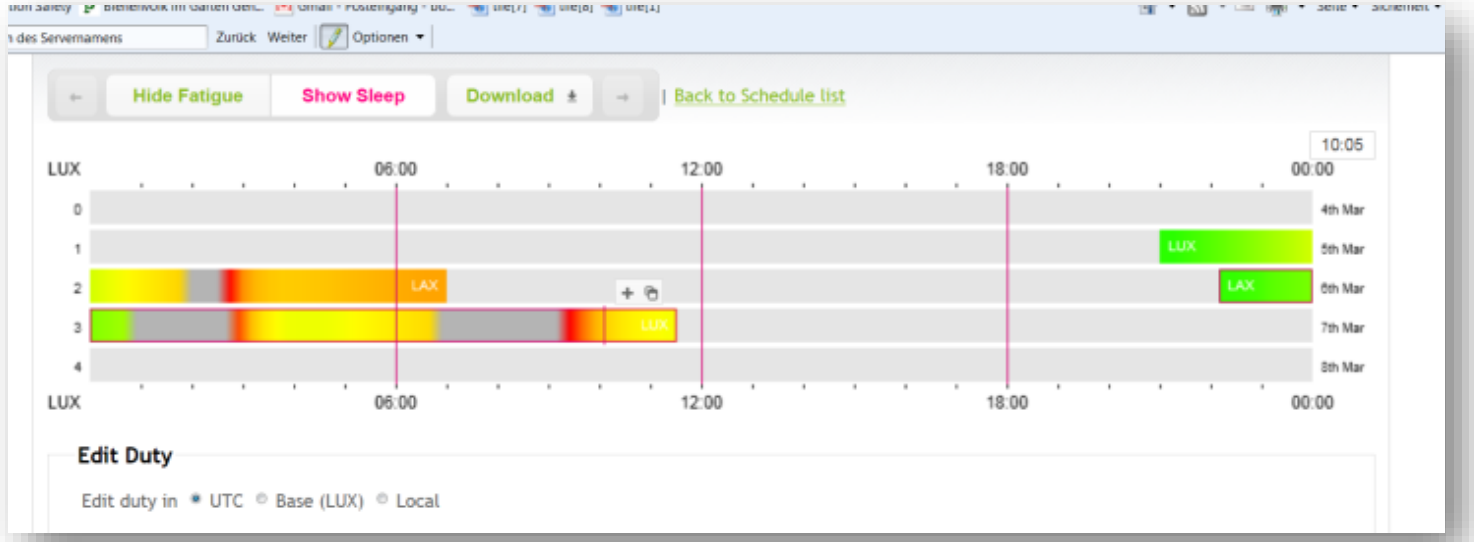

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Model integrated into Execution Phase

Use of the Model as part of Fatigue Report Investigations

Use of the Model as part of other Report Investigations

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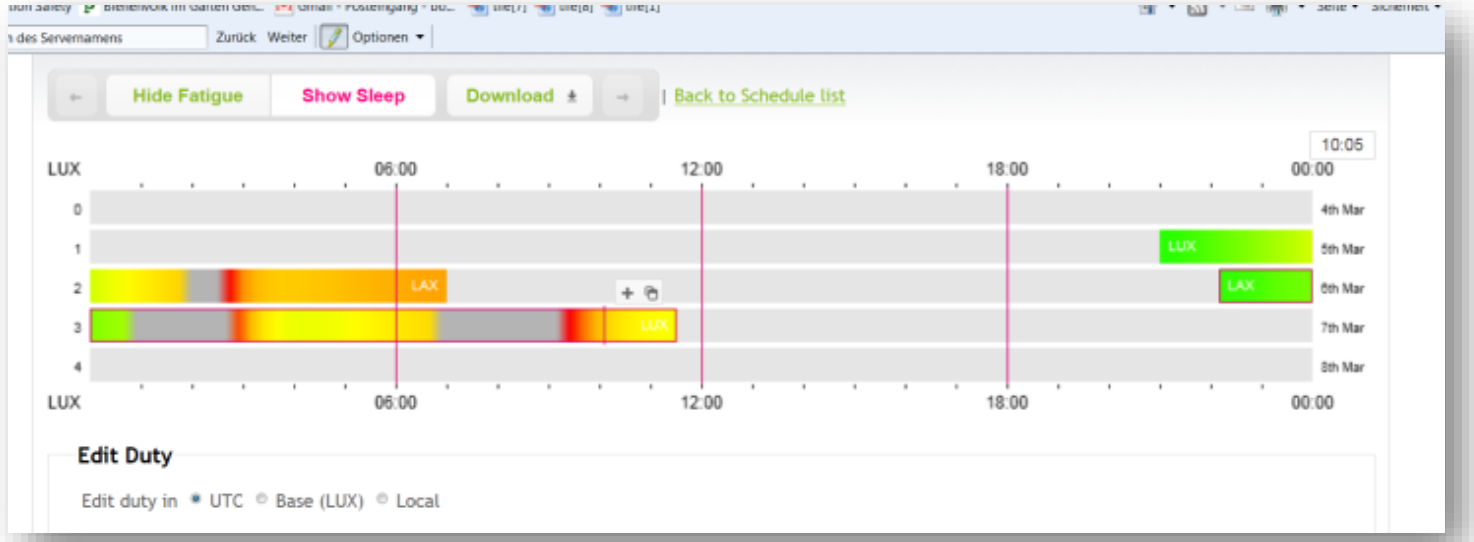

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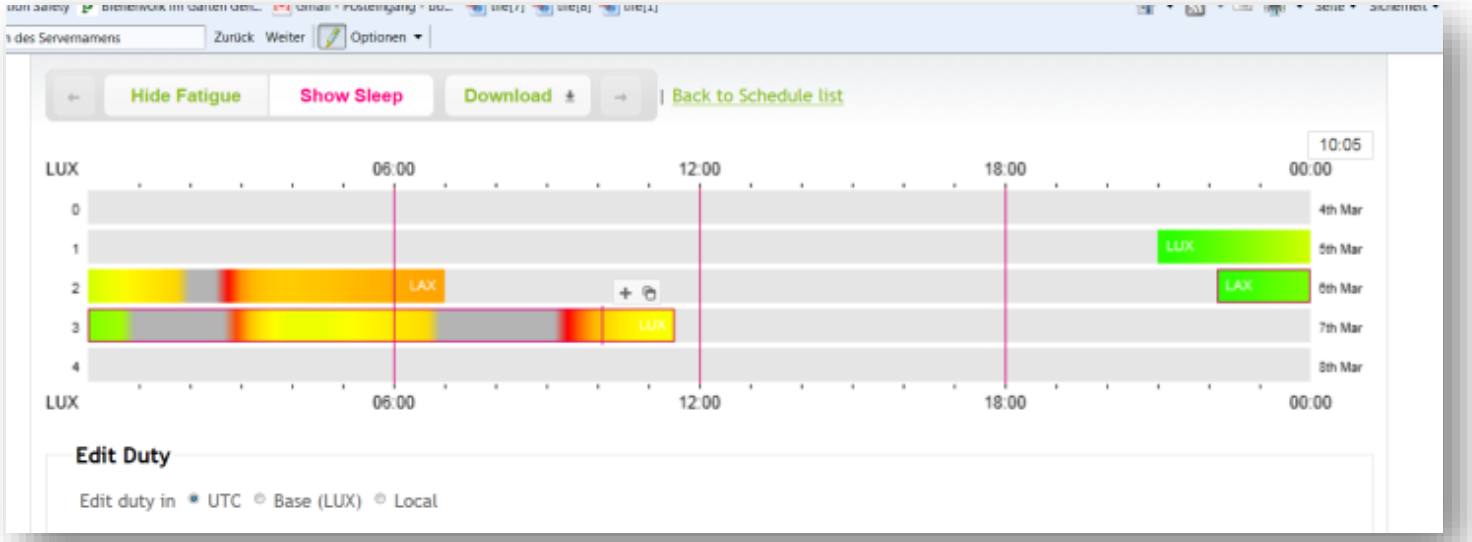

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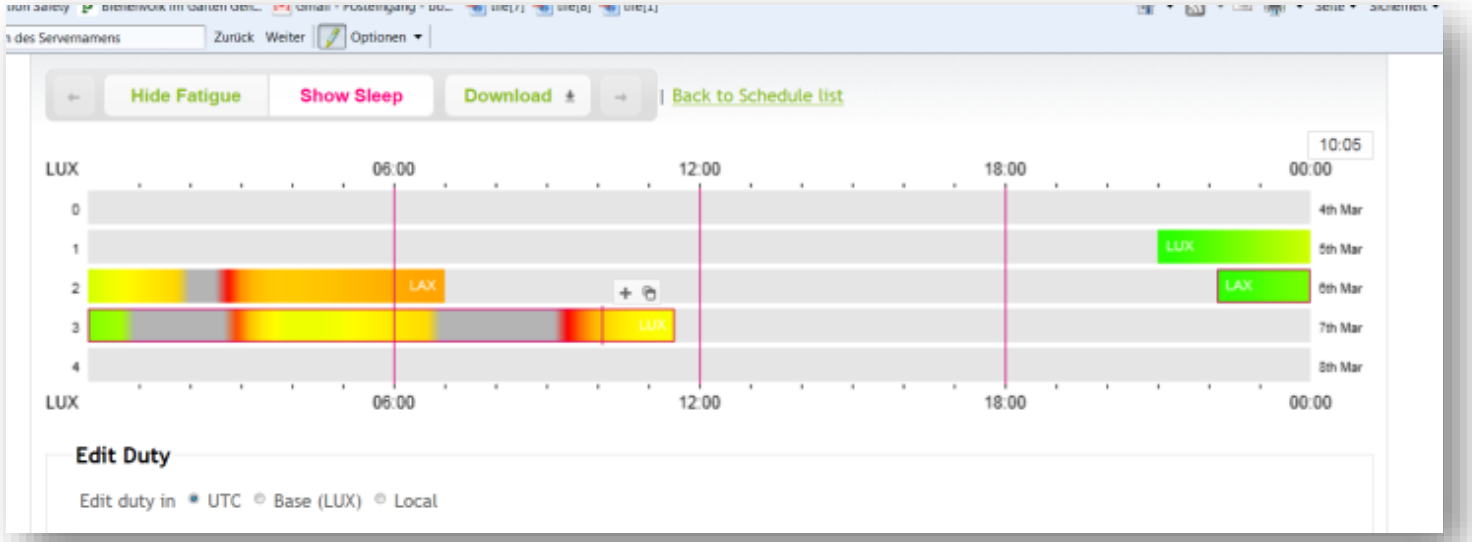

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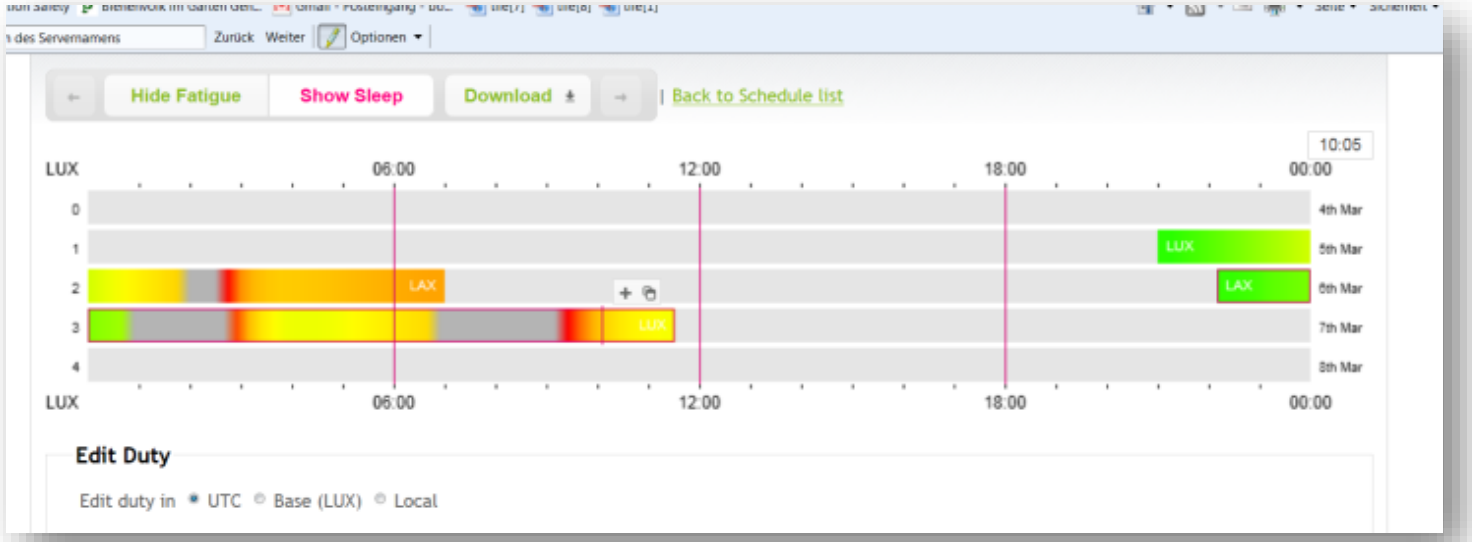

Model integrated into Planning Phase

Model integrated into Execution Phase

Use of the Model as part of Fatigue Report Investigations

Use of the Model as part of other Report Investigations

Data integration into Safety Analytics Platform

Use of gained Safety Intelligence

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Biomathematical Model

Model integrated into Planning Phase

Model integrated into Execution Phase

Use of the Model as part of Fatigue Report Investigations

Use of the Model as part of other Report Investigations

Feedback to reporter

Data integration into Safety Analytics Platform

Use of gained Safety Intelligence

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FRM(S) Setup

Reporting

Biomathematical Model

Data Analytics

Challenges

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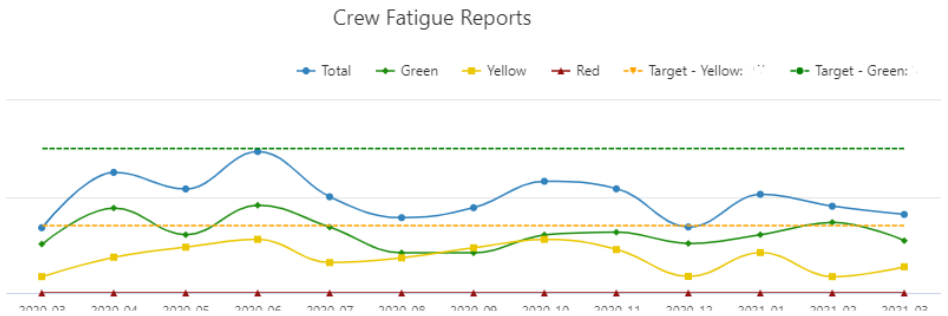
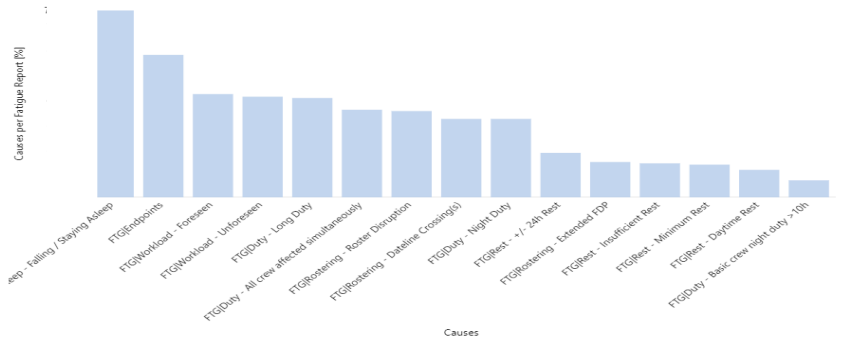
Data Analytics





Fatigue Reporting Data

Bio Mathematical Model

Other Data Integration (FDM/Survey)

Use of gained Safety Intelligence

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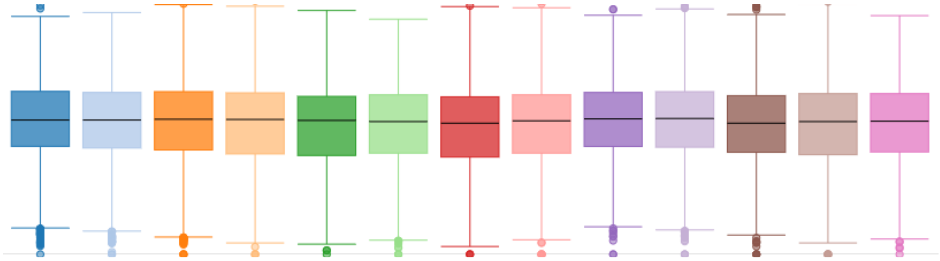
Data Analytics



Fatigue Reporting Data

Bio Mathematical Model

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Use of gained Safety Intelligence

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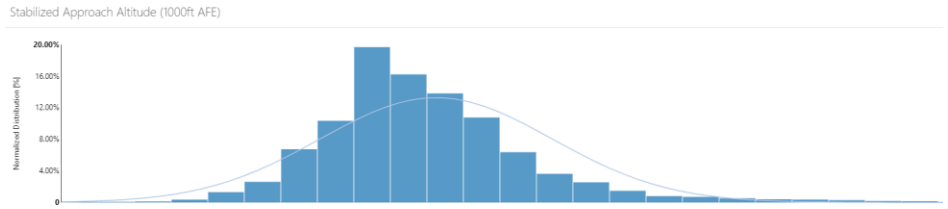
Data Analytics



Controlled Flight into Terrain Precursors

GPWS Activation by 100 Flights

Fatigue Reporting Data

Bio Mathematical Model

Other Data Integration (FDM/Survey)

Use of gained Safety Intelligence

(Examples)

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Data Analytics

Fatigue Reporting Data

Bio Mathematical Model

Other Data Integration (FDM/Survey)

Use of gained Safety Intelligence

(Examples)

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FRM(S) Setup

Reporting

Biomathematical Model

Data Analytics

Challenges

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General FRM(S) Challenges (especially during COVID19)

24/7	Multipoint rotations	Long and short-haul	Basic and augmented crewing
Complex time zone transitions	Multitude of post-flight rest variants	At times highly complex airports	Short term changes

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FRM(S) Challenges (especially during COVID19)

Under / Over Reporting	**Biomathematical Sleep patterns**	**Weakness of Biomathematical Model**	**Subjectivity**
Differences in Reporting vs. Biomathematical Model	**Human Diversity**	…..	

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Summary

Fatigue Reporting

Biomathematical Model

Data Analytics

THANK YOU FOR YOUR ATTENTION!

Cpt. Mattias Pak MSc. FRAeS
Vice President Aviation Safety
Cargolux Airlines International