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AIRCRAFT-BASED CREW SUPPORT SYSTEMS

Viewing the aircraft as a source of quality data for FRMS

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"My mind clicks on and off … I try letting one eyelid close at a time while I prop the other open with my will. My whole body argues dully that nothing, nothing life can attain, is quite so desirable as sleep. My mind is losing resolution and control." – Charles Lindbergh, 1953

A SYSTEM OF HIGHLY-INTERDEPENDENT PERFORMANCE TARGETS

- Individual Wellbeing and Quality of Life
- Pride in Professionalism
- Performance to Standards, SOP Compliance
- Fitness for Duty

- Employee Health and Wellbeing
- Operating Cost Structure
- Schedule Performance, Customer Experience
- Operational Safety

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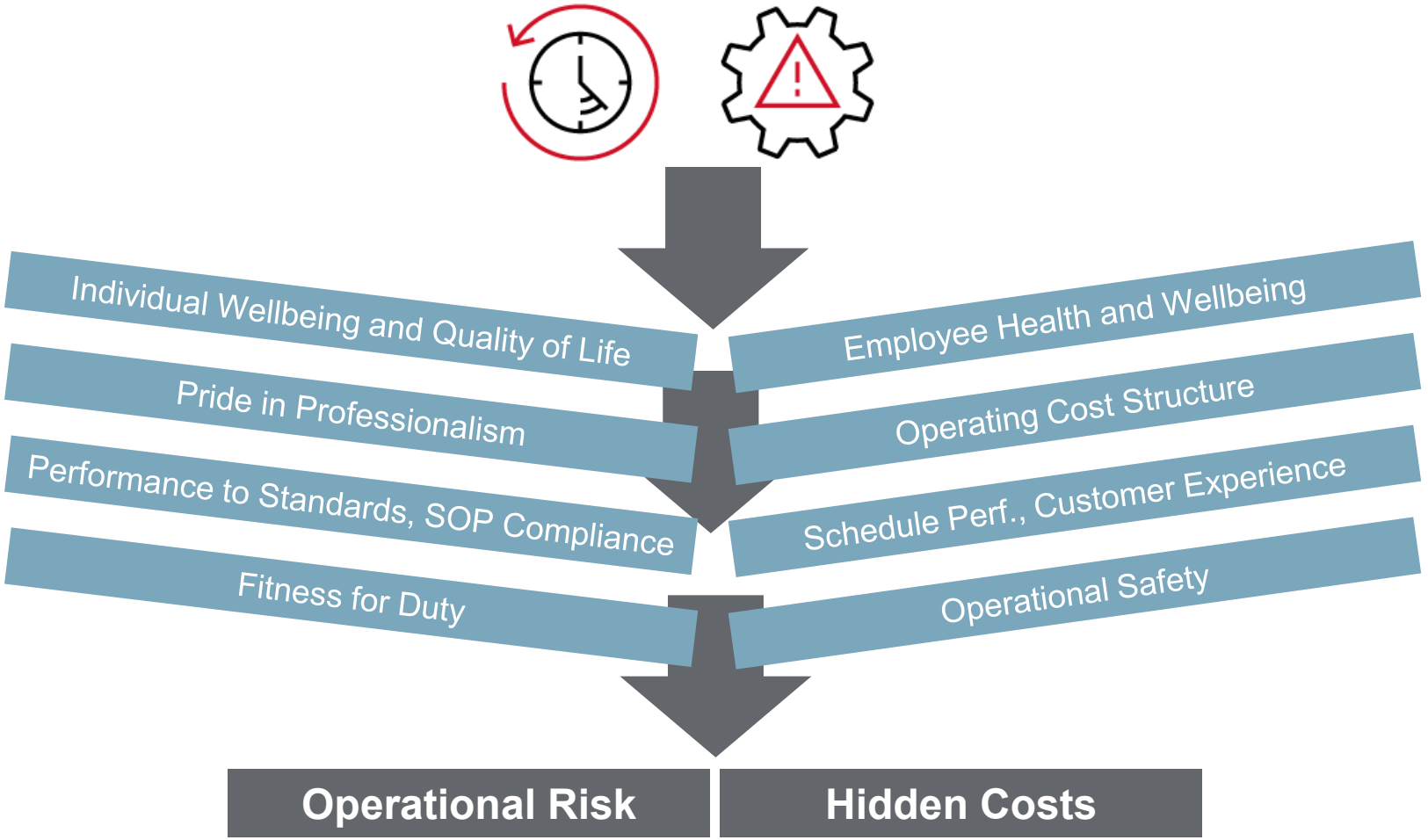
CREW FATIGUE PRESSURES ALL ASPECTS OF THE SYSTEM



How well are we measuring fatigue today?

- Data completeness?
- Degree of objectivity?
- Accuracy?
- Confidence?

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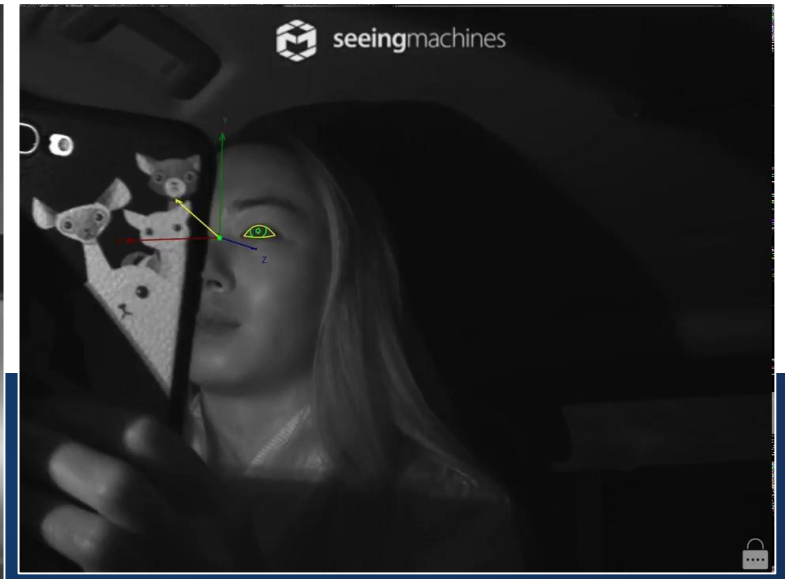
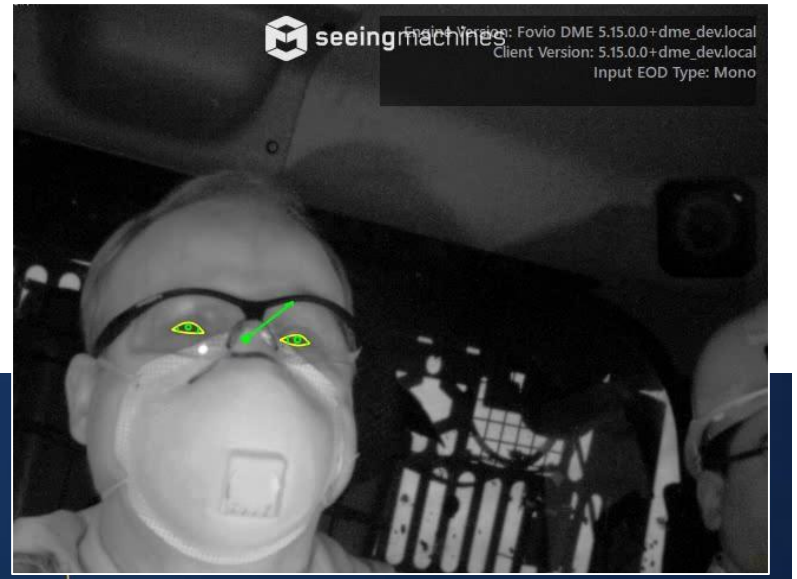
A REFERENCE - AUTOMOTIVE, TRUCKS, MINING





- Objective data w/reported confidence
- Head position, eye gaze, eye closure
- ML algorithms classify fatigue state
- Alerting and analysis
- Automotive grade tech with 1M+ installations globally
- Global exclusive collaboration with Caterpillar Inc., for mining safety
- >14 Bn kilometers (and growing) of data

Images & logo courtesy of Seeing Machines

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AIRCRAFT-BASED CREW SUPPORT GOALS

Empower flight crews

Real-time, quantitative feedback while in-flight

Help individuals better understand their own patterns of performance over time

Learn how to best manage rest and readiness

On an individual, confidential basis

and

Better optimize scheduling

High-fidelity FRMS data collection

Supporting higher quality crew scheduling optimization decisions

Improve safety risk management

Using aggregate, anonymous statistics

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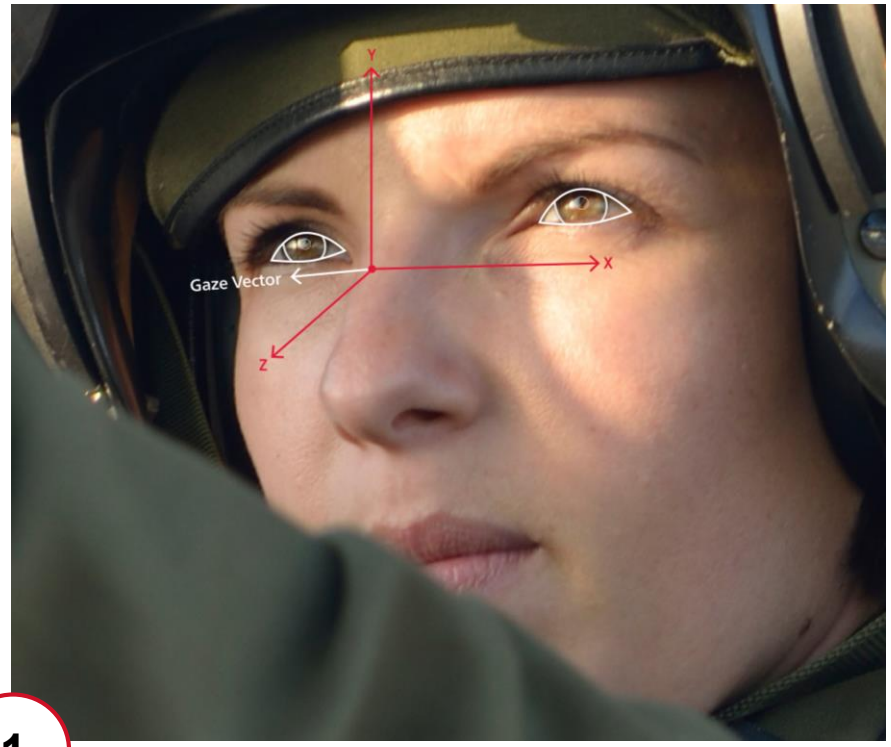
THE AIRCRAFT AS A SOURCE OF QUALITY DATA



1

Use pre-trained algorithms to assess

- Presence
- Head and eyelid positions
- Pupil diameter
- Gaze direction

As drowsiness levels exceed predefined thresholds, issue escalating advisory annunciations on the flight deck

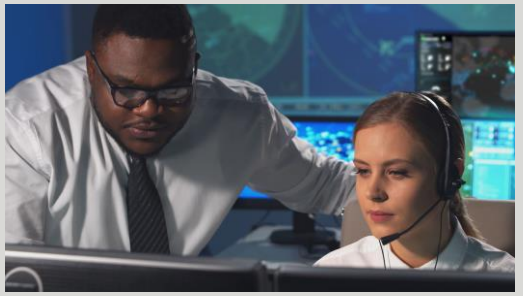
2

Correlate w/aircraft data

e.g. UTC date/time, airspeed, altitude …

3

Integrate data into FRMS for consideration in strategic planning decisions



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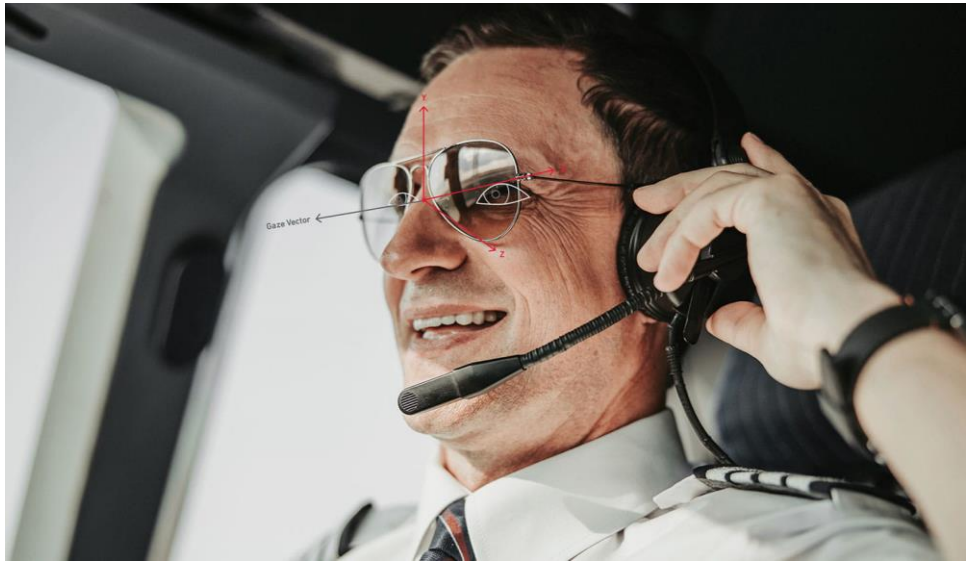
ON THE HORIZON



Complete system development and initial certifications

In parallel (operators) – incorporate into Standard Operating Procedures, data governance, etc.

Future – integrate additional biological signals, operating modes, and annunciation capabilities

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