

FRMS - Experience within FTLs

Implementing and maintaining a performance driven FRMS



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FRMS – Experience within FTLs

0 Why implementing FRMS within Flight Time Limitation Regulations (FTLs)

1 Chronology

2 Fatigue Management Framework

3 Fatigue Safety Action Group FSAG

4 Multilayered Defenses

5 Fatigue Performance

6 Conclusions

Why introducing FRMS within existing FTLs?

- Operational experience indicated a fatigue issue
- Fatigue risk mitigation was inefficient, just through compliance to prescriptive FTLs and labor agreements
- Maximum crew productivity not fully achieved before
- EU-OPS 1.1090 transfers responsibility to manage fatigue to the operator and individual crew members
- SMS: *"It remains the operator's responsibility to manage fatigue-related risk through their existing safety management process"*
(Source: Doc 9966 1-2)
- No standard solution available to manage fatigue – but FRMS (Doc 9966 – 1-5: *"an FRMS approach, with its added requirements, can also be applied within prescriptive FTLs"*)
- Scientific literature and FRMS guidance material is available

Why introducing FRMS within existing FTLs?

- We have accepted that humans don't perform constantly well around the clock
- We have accepted that we are responsible to manage the risks of fatigue in our operation

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Chronology: From tired flight crews to a performance driven FRMS

- Oct 2002 Start of Flight Operations GWI
- Oct 2005 CRM recurrent training topic: „Fatigue & Vigilance“
- Aug 2006 First fatigue survey
- Dec 2006 Report databank fatigue-analysis
- Jan 2007 Proposal: „Alertness Management Program“
- Mar 2007 Decision by senior management to implement FRMS, Policy signed
- May 2007 Initial meeting FSAG
- Jan 2008 Official application of scientific (additional) roster rules
- Sep 2008 Scientific study of „Workload & Fatigue“ by DLR
- Dec 2008 Fatigue software introduced for performance monitoring
- Feb 2009 First „Fatigue Management Training“ for crew schedulers
- May 2010 New management, new FRMS policy signed
- Mar 2011 Fatigue model-based optimizing of rosters
- Aug 2011 First predictive performance indicators

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2 **Fatigue Management Framework**

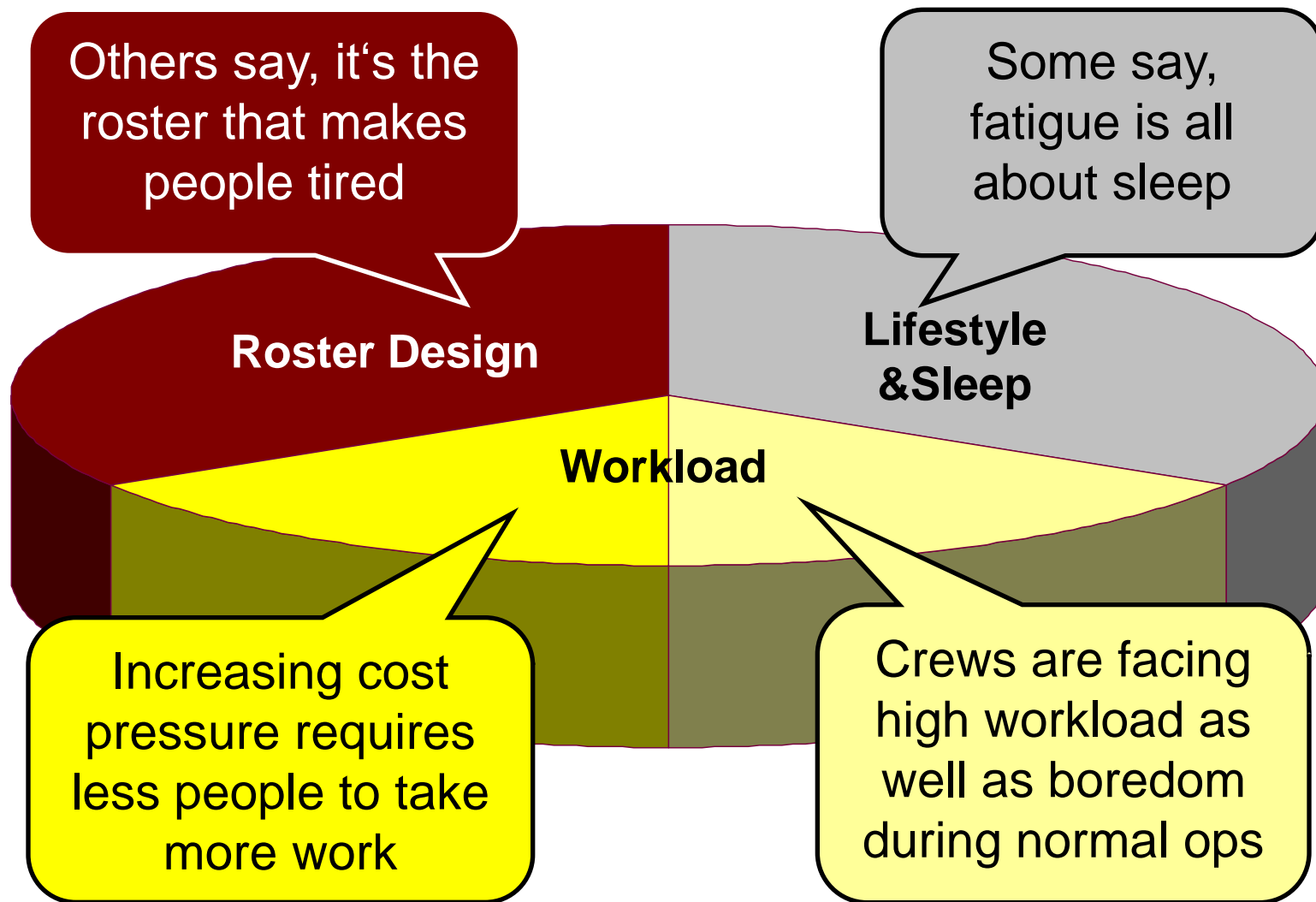
3 Fatigue Safety Action Group FSAG

4 Multilayered Defenses

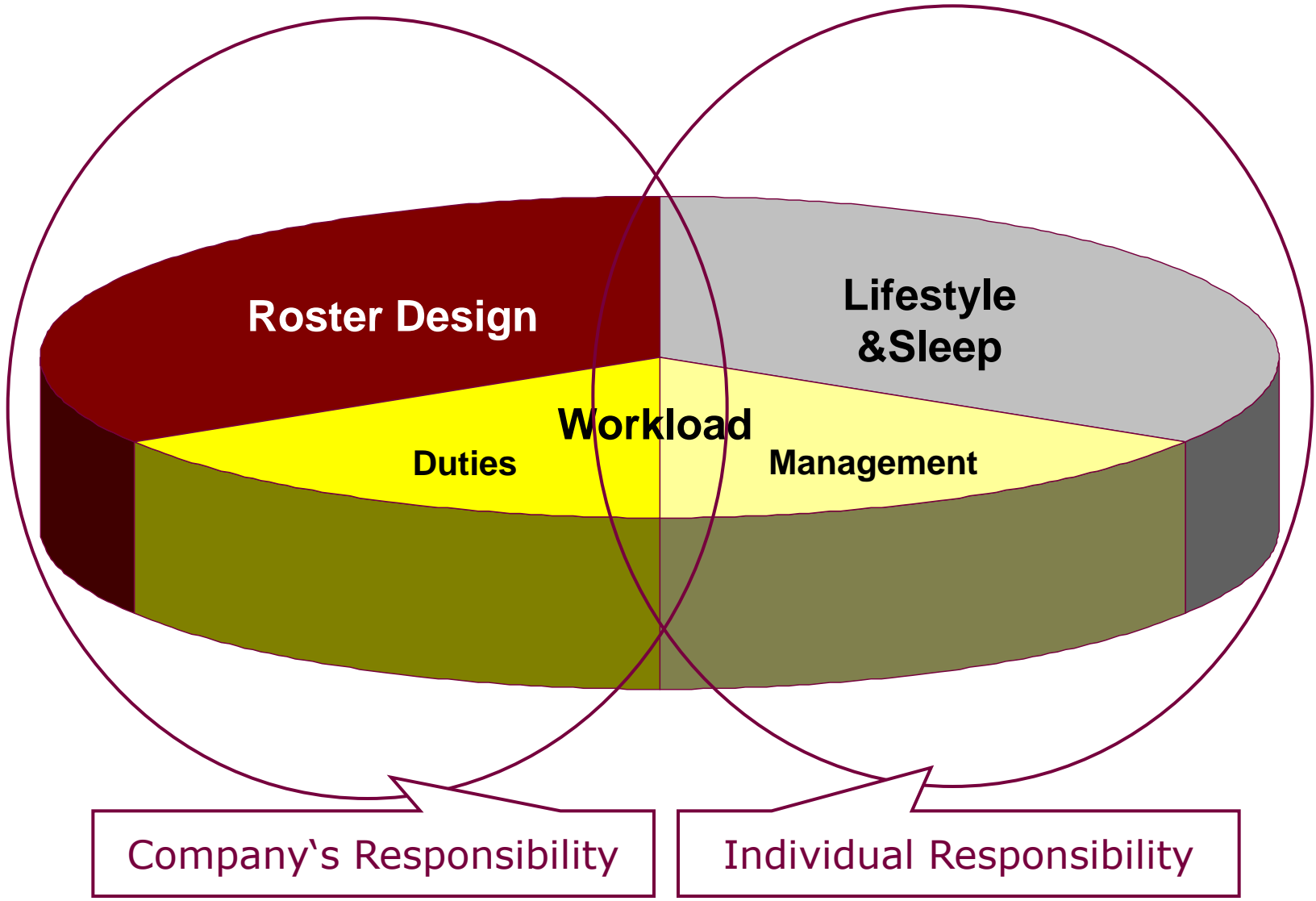
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Fatigue Management Framework



Fatigue Management Framework

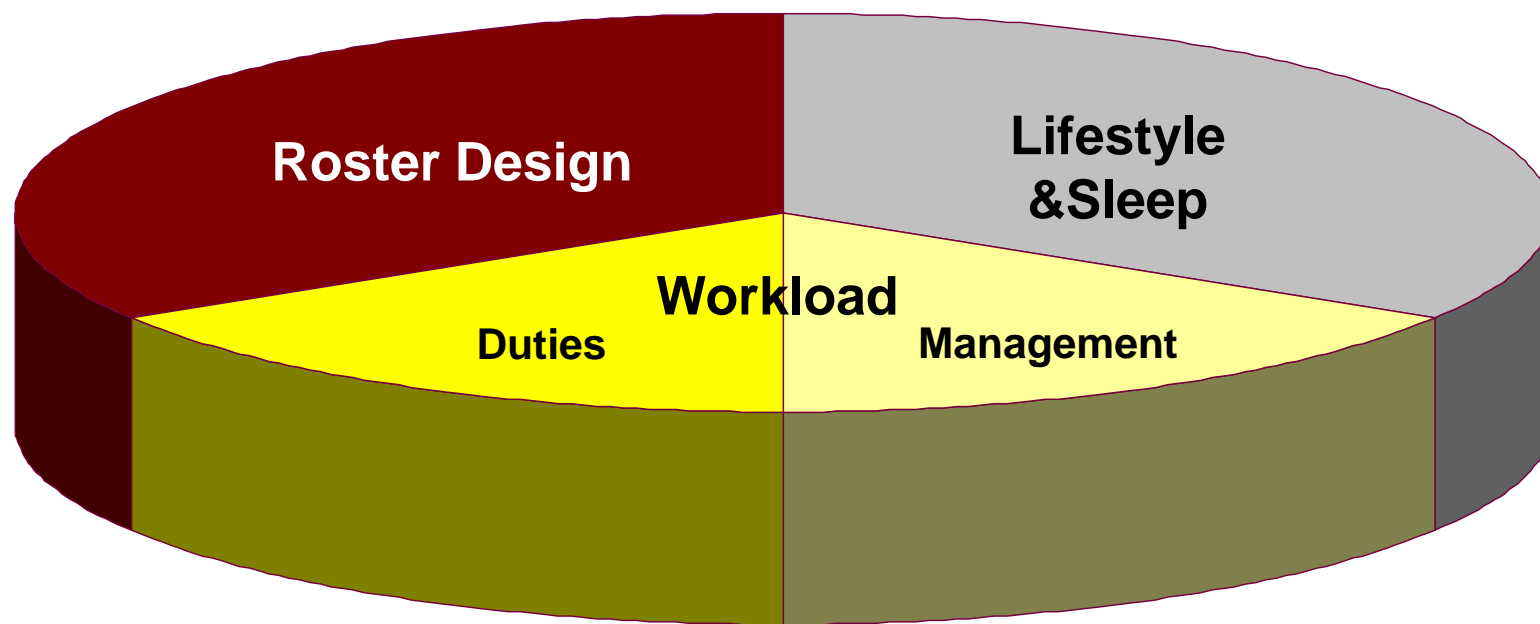


Company's Responsibility

Individual Responsibility

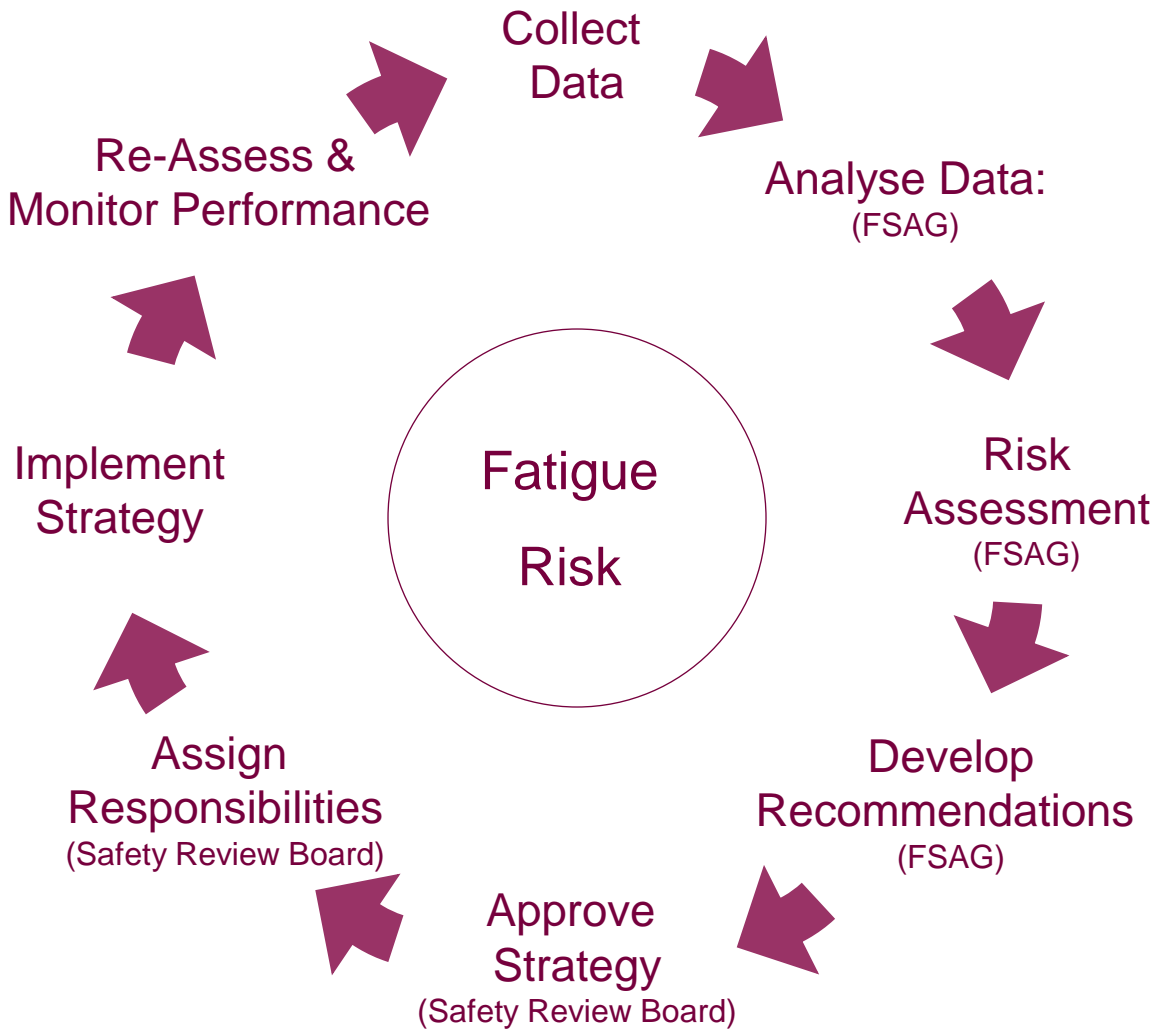
Fatigue Management Framework

We need both sides!



Fatigue may be caused and managed in each part

FRMS Management Cycle (SMS)



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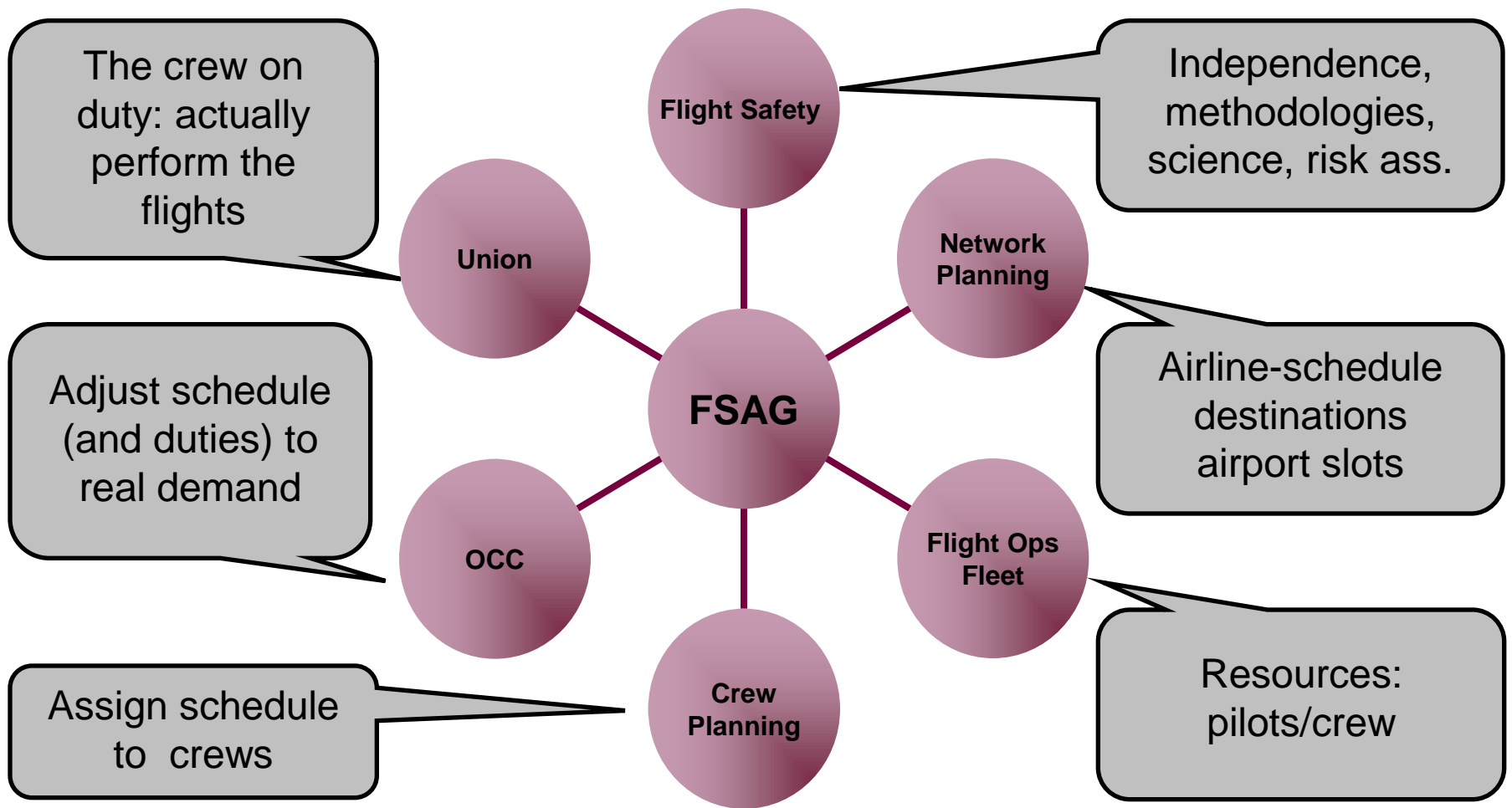
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The Fatigue Safety Action Group (FSAG)



Fatigue Safety Action Group (FSAG)

FSAG Principles:

All recommendations must be -

- **relevant for specific operations**
- **based on scientific data**
- **consistent with company's business objectives**

All participants of the FSAG are „non decision makers“ (!)

The FSAG provides recommendations only-
Decissions are up to the Safety Review Board, according risk
assessment and effectiveness of recommendations

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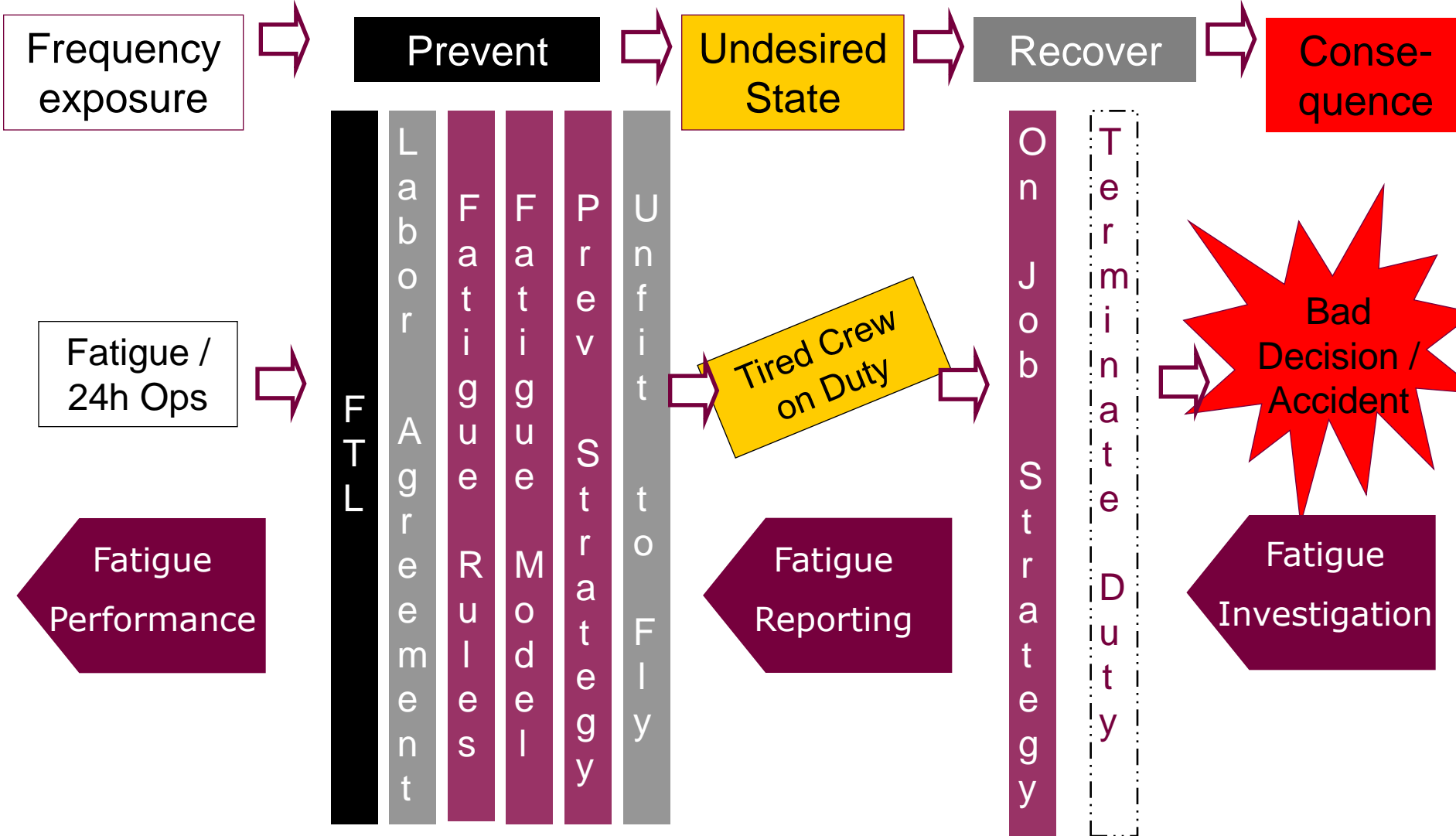
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Multilayered Defenses to Control Fatigue Risk (SIRA)



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If we want to manage it – we need to measure it: SPIs

Several Safety Performance Indicators (SPIs) are defined

The SPI shown at the conference was based on the results of a selected fatigue-software-model

All flights above a defined tolerance level (red duties) before FRMS implementation were set as the baseline (0)

The SPI shown, indicated the reduction (%) of red duties since implementing fatigue mitigation measures over 5 years

The shown SPI is an example how fatigue-risk is measurable. It also showed that fatigue safety performance has considerably improved since FRMS implementation

All duties performed were within European FTLs at any time

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Conclusions after 5 years of managing fatigue through FRMS

- Managing fatigue is a shared responsibility – don't forget the other side
- The FSAG is a benefit itself
- Principles for FSAG are indispensable (specific, scientific, economic)
- Fatigue software beneficial for performance monitoring & assessment
- The main conclusion concerning rostering in fatigue management:
It is not the single duty which causes high levels of fatigue!
It is the sequence of duties and how humans can adopt to it!
This results in manageable rosters without loss in productivity.

Final Conclusions

- Implementation of a FRMS is beneficial even within FTLs and labor agreements
- We can demonstrate a reduction of fatigue risk with high(er) crew productivity at the same time
- Today we consider a performance driven FRMS the best way to manage fatigue

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VIELEN DANK

Thank you for your attention!