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Resilience: A Regional Safety Focus



Yann Duval

ACCELERATING SUSTAINABLE CONNECTIONS

Resilience: A Regional Safety Focus

- Intro
- Context
- Mitigations
- Way forward



Silent endurance

“How can we distinguish “resilient performance” from “silent endurance” before the tragedy occurs?”

~200
operators/lessor

~100
countries



Regional Airlines open routes.

Regional Airlines are operating in a specific market segment, with 1 flight hours to cycle ratio.

Regional Airlines have to be very creative, find ways to achieve the same standard, not the same implementation.

We expect flying crews to have a high level of physical & mental performance.

But how do we support regional flight crews to optimize their performance in their operational context ?

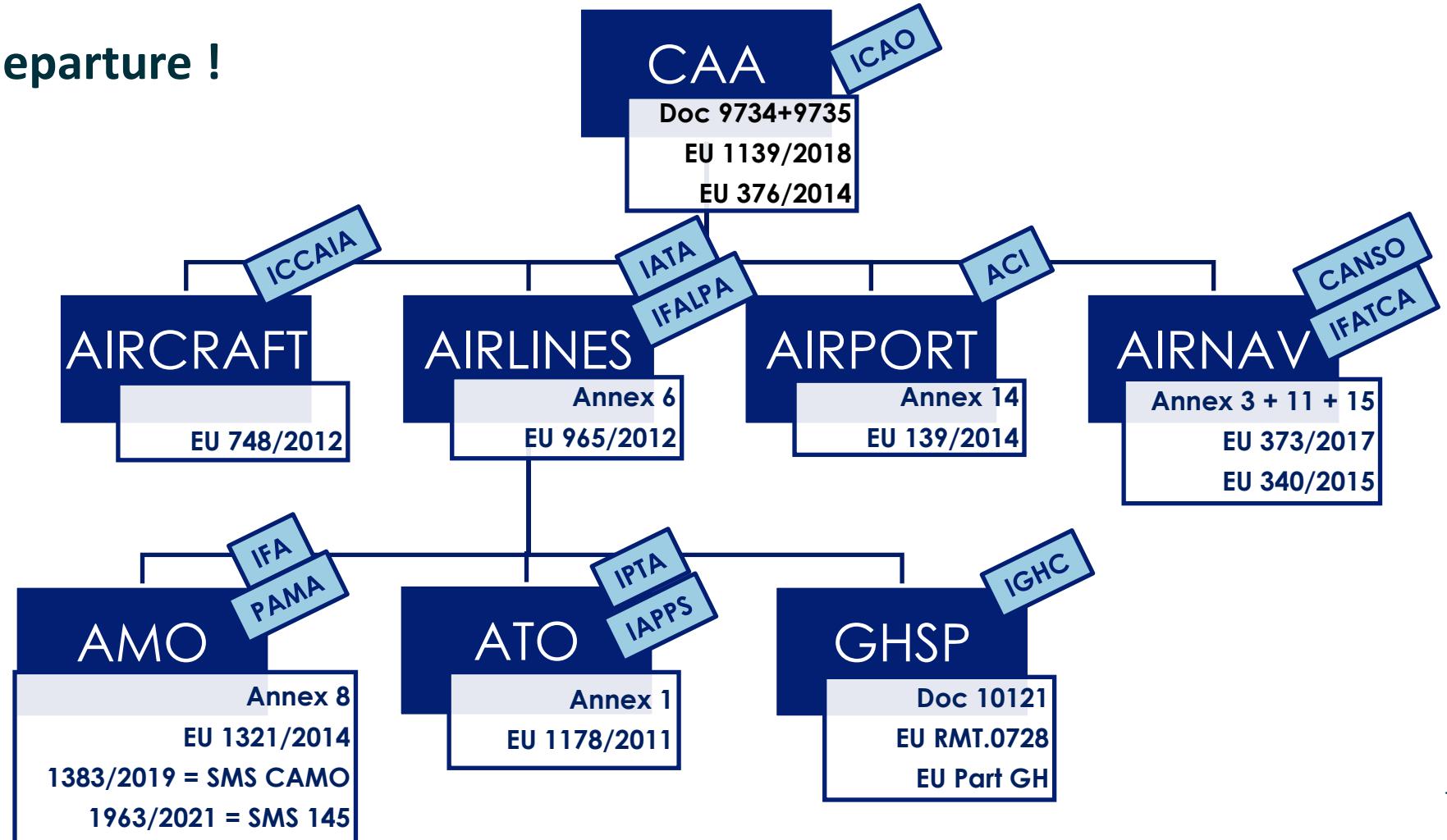


A photograph of the interior of an airplane cockpit. Two pilots, both wearing headsets, are seated in their respective seats. The pilot on the left is facing the left side of the cockpit, while the pilot on the right is facing the right. They are surrounded by a complex array of electronic displays, including a large multi-function display on the left showing a flight plan, and various control panels and buttons. The cockpit is dimly lit, with the primary light source being the displays themselves.

An accident doesn't start in the cockpit.

Commercial Air Transport Eco-system

All must act before departure !



CAA

A French history of Reduced Rest regulation:

Civil Aviation Code (CAC)

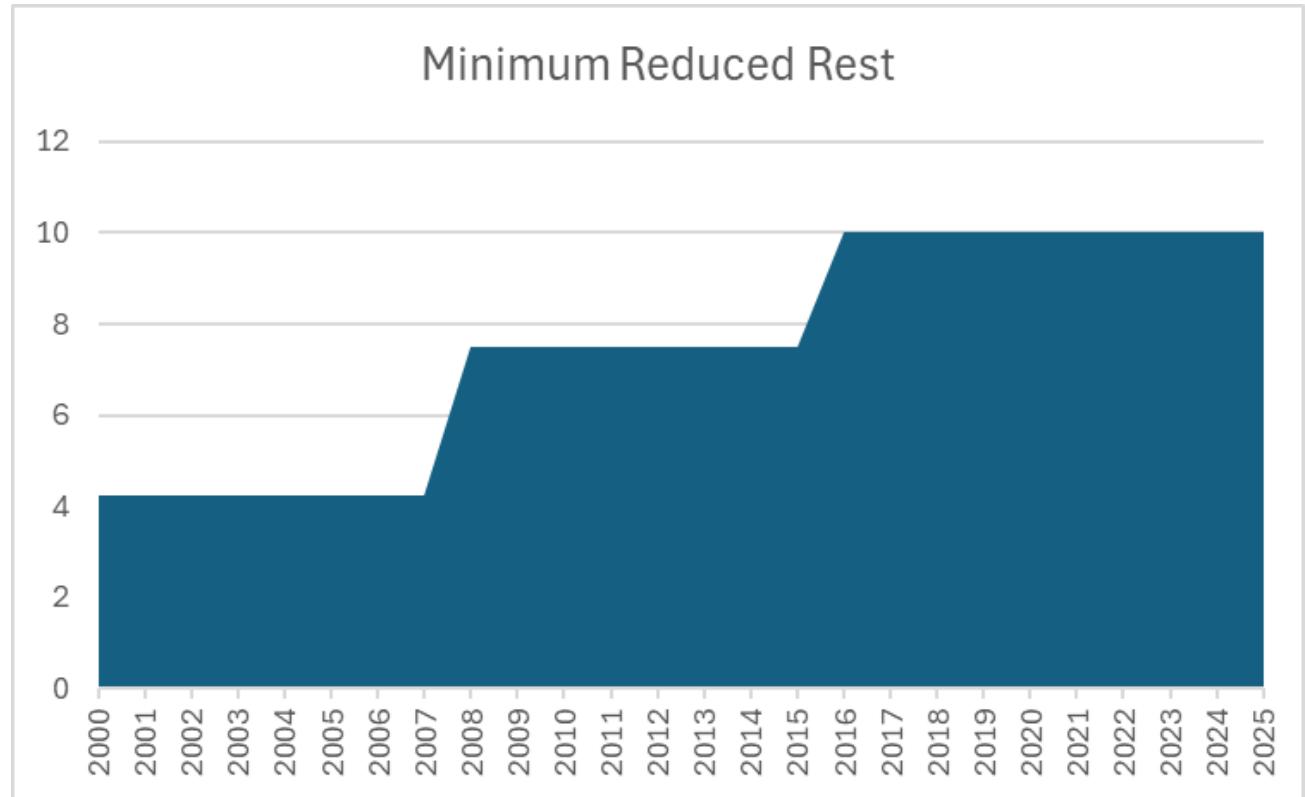
- Layover : **4h15**

Sub-Part Q (EU-OPS) since 16/07/2008

- Layover : **7h30 + 2x(t-15)**

ORO.FTL (AIR-OPS) since 16/02/2016

- Layover : **10h00**
- 8h sleep



By regulation, rest period has improved for Reduced Rest in outstation.

PART 145 :

Shortage of team:

- In theory: 2 mechanics per night
- In practice: only 1 mechanic per night
- Deviation becoming the norm

Adaptation:

- Isolate critical tasks => 2 mechanics
 - **1 Execute**
 - **1 Control**

What about number of MEL ?

Max 3 in main base ?

When do we cross the line ?



OEM : OEB Reduction plan

(Operational Engineering Bulletin)

End 2020 : 44 active OEB for all ATR fleet.

ATR promotes the implementation of SB solutions (technical fix) that cancel OEBs
AND
Track implementation of the retrofit.

ATR have significantly reduced
the number of active OEB (Max 3 per AC).



GHSP and Airlines : Regional Pilot acting as Coordinator

In Outstation

- Flight Plan, Fuel, W&B, luggage, safety perimeter, catering, seating, waiting for missing paper
- Walk Around in complete mindfulness (Pilot External Inspection : 5mn)
- Variable weather conditions

Time keeper (turnaround coordinator):

- Short turnaround (20mn)
- Number of legs (max 10)
- Delay
- Time pressure (Slot, Curfew, Sunset), Stress

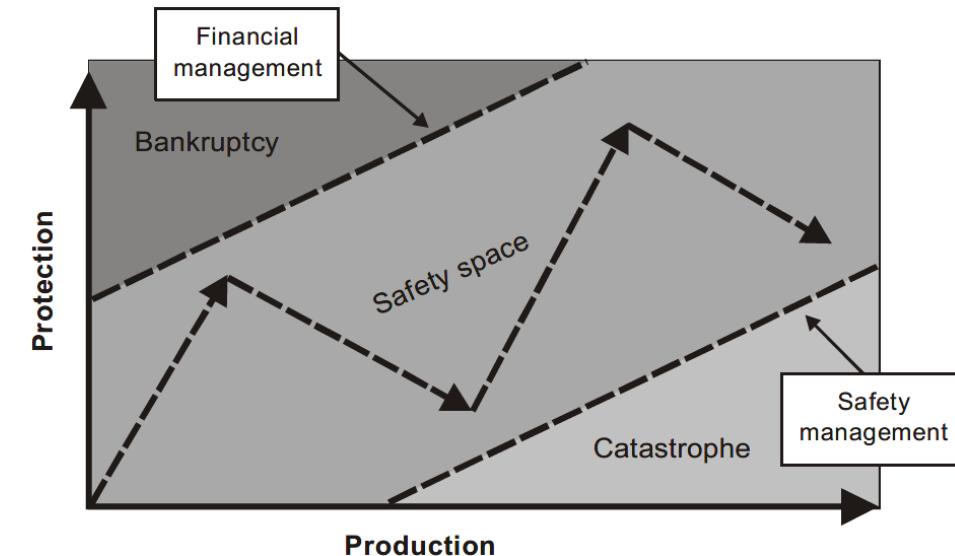
⇒ **Hurry-up syndrome**



Airlines

Example outside EU

Sub Para	Maximum Flight Time	Maximum Flight Duty Period (in Hours)	Maximum No. of Landings
6.1.1	8 hrs	11:00	6
		11.30	5
		12:00	4
		12.30	3



EASA ORO.FTL.205 Flight duty period (FDP)

Maximum daily FDP — Acclimatised crew members

Start of FDP at reference time	1–2 Sectors	3 Sectors	4 Sectors	5 Sectors	6 Sectors	7 Sectors	8 Sectors	9 Sectors	10 Sectors
0600–1329	13:00	12:30	12:00	11:30	11:00	10:30	10:00	09:30	09:00

10 legs, high workload, no break
How do we ensure resilient performance ?

Bio-Mathematical Model for Regional Airlines (high workload):

Scoring after the flight:		
FDF	PTP	1,553
PTP	SFG	1,995
SFG	PTP	2,449
		3 legs
FDF	PTP	3,535
PTP	SFG	3,974
SFG	PTP	4,412
PTP	FDF	4,841
FDF	PTP	5,277
PTP	FDF	5,701
		6 legs
FDF	PTP	3,999
PTP	SFG	4,438
SFG	PTP	4,864
PTP	FDF	5,296
FDF	PTP	5,724
PTP	FDF	6,155
FDF	PTP	6,584
		7 legs

Samn Perelli Subjective Fatigue Scale

1. Fully Alert, wide awake
2. Very lively, responsive, but not at peak
3. OK somewhat fresh
4. A little tired, less than fresh
5. Moderately tired, let down
6. Extremely tired, very difficult to concentrate
7. Completely exhausted, unable to function

Mitigations : Workload

Build margin through :

Flight program analysis:

- Transit time (20mn : can/must ?)
- Curfew, sunset
- Break for rest & meal (1 long transit)

Operational reliability:

- Flight time per route
- Turnaround time per airport

Soft Rules (by survey, common sense)



Mitigations : Fatigue

Robustness and stability:

- Days off, work/rest cycles, morning/evening cycles
- Standby pilots' agreement

Training/Communication for pilots and roster manager:

- FTL and FRM training
- FTL is a limit, not a target
- Recover : 2 consecutive nights of unrestricted sleep

Nutrition for pilots:

- Alternate meals between Captain and First Officer
- Cf professional sports people (**protein > sugar**)

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Would you put **JUNK** parts
in an aircraft?

...so, why put **JUNK**
food in your body?



Eat high protein & low carb snacks during
sleepiest times at work (3-5 am & 3-5 pm)

- Plan healthy meals in advance.
- Take healthy meals & snacks to work.
- Drink 8 glasses of water per day.
- Avoid large meals before bedtime.

The way to Resilient Performance:
Fatigue report is a **weak signal**.

ATR recommends Regional Airlines to:

- Adapt SMS and handle properly weak signals
- Recognize fatigue as a risk
- Convince organisation to act
- Decide mitigations to organize and monitor...

ATR has proposed some specific cockpit recommendations

:

Breaking the routine/repetition with special briefing
(principles of Threat and Error Management).



Way forward

“How can we distinguish “resilient performance” from “silent endurance” before the tragedy occurs?”

“Silent Endurance”

Human, short term

Endure the pain, withstand the pain (heroes)

Normalization of Drift / Deviation

“Resilient Performance”

Organization, long term

Support the organization behind the crew

We build the safety margin before the cockpit.





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