seeingmachines

Hello Tomorrow Emirates

Eyes are never quiet

Towards Eye Tracking as a Practical Training Tool

Capt. Mark Cameron, HF Specialist - Emirates

Pat Nolan, GM Aviation - Seeing Machines

IASS 2018

November 12-14

Seattle, USA

seeingmachines

After Dublin IASS 2017

Emirates

seeingmachines

A330 APT to A380 & B737 FFS

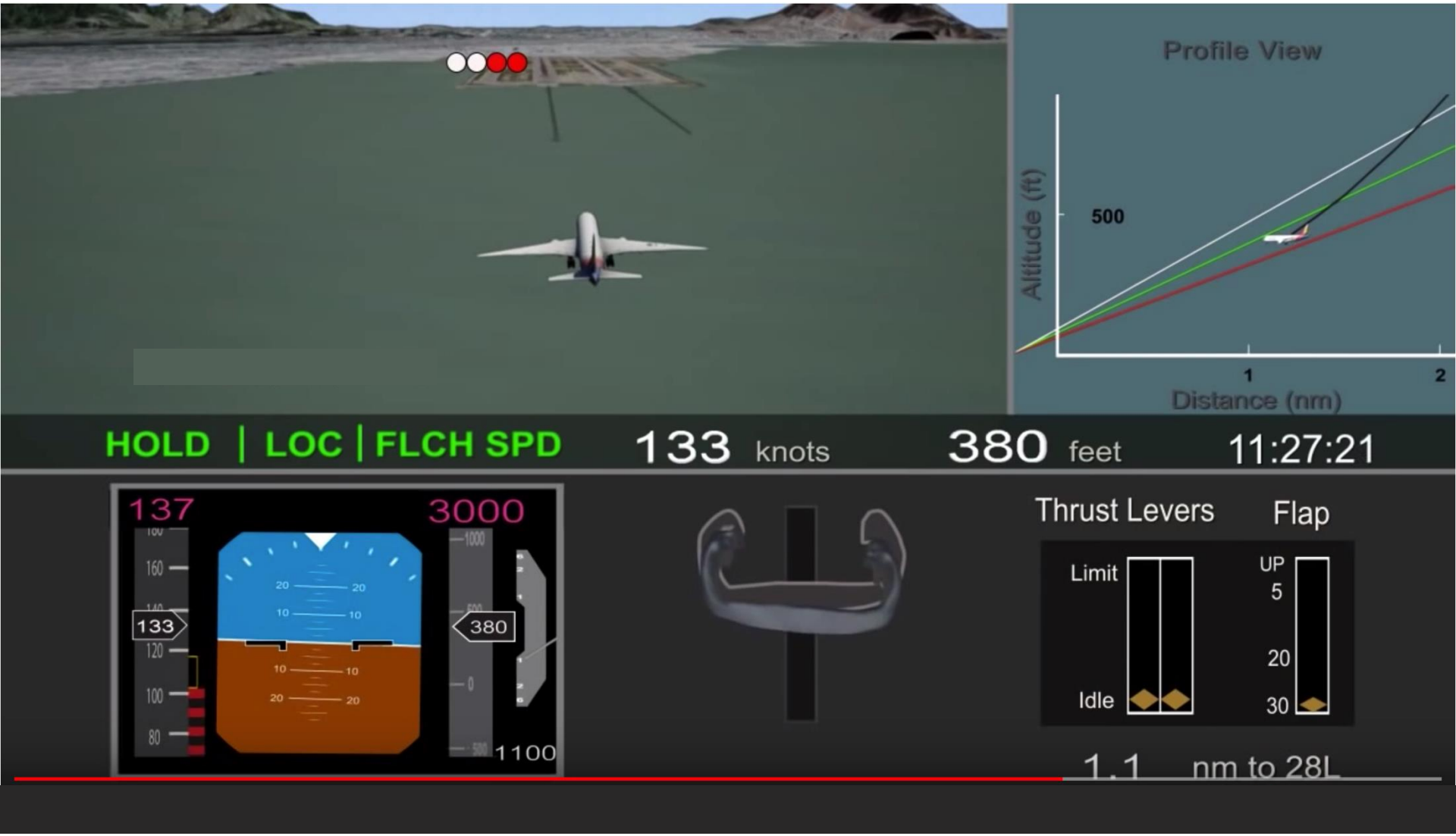
Emirates

seeingmachines

At the critical moment…

Emirates

HL7742 San Francisco 2013



NTSB/AAR-14/01, p 179

EC-HFP Madrid 2008

seeingmachines

G-WNSB Sumburgh 2013

Emirates

UKAAIB Report 1/2016, p 212

seeingmachines

These all happened here first

Emirates

seeingmachines

Emirates

From Academic Curiosity to Product

- Technology / innovation
- How to move from 'interesting' to ‘useful'
- How to make data easy to consume

seeingmachines

The right data at the right time

Emirates

seeingmachines

A380 FFS Scenario Construction:

Emirates

Profiles for Proof of Concept

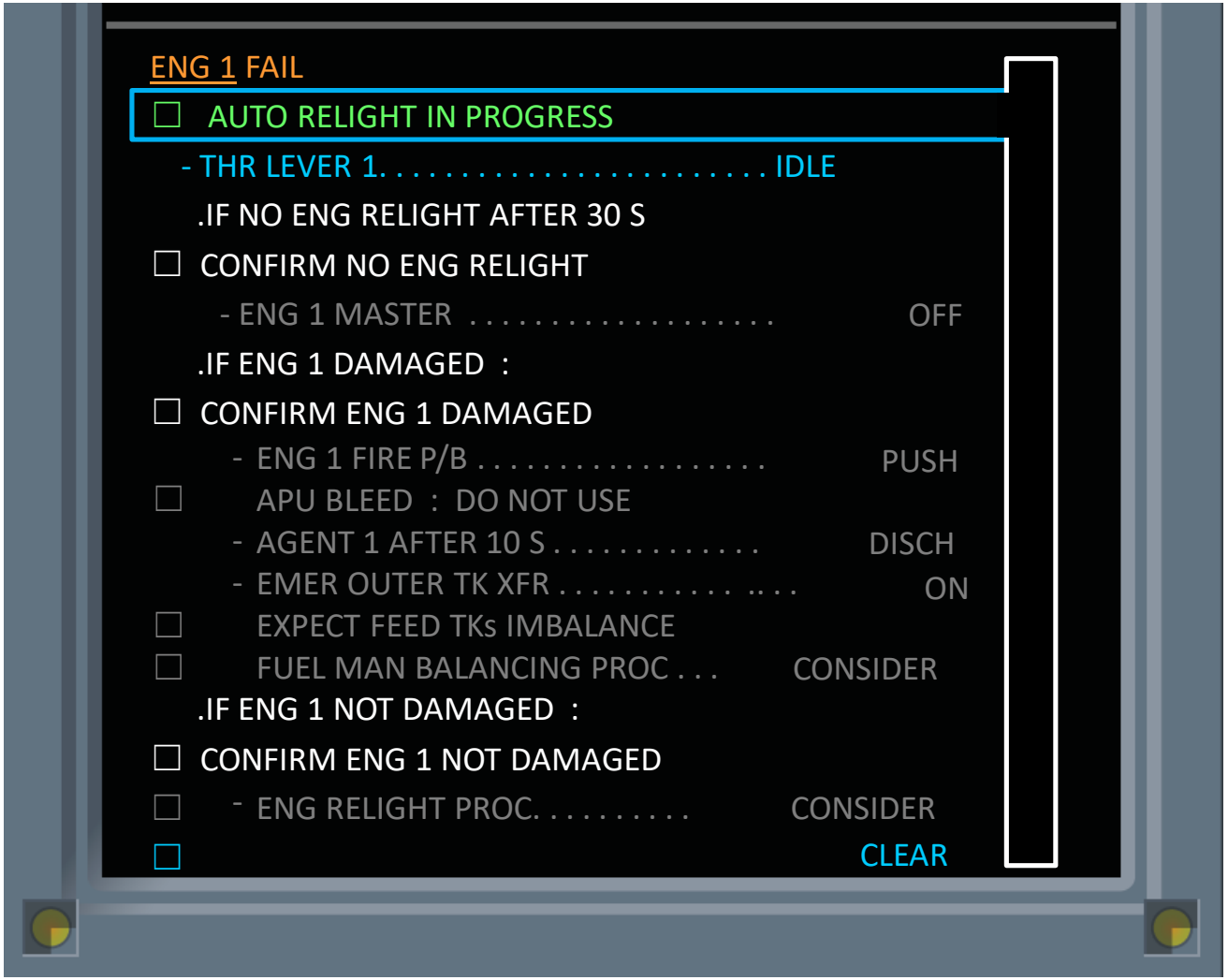
- Visual Circuit CM1 & CM2
- Engine failure V_1-10kts
- Home base STAR with three sub-events:
  - No Altitude Capture 8000 ft.
  - ATC vector through localizer
  - Wind shift below 200’ agl – potential long landing.

seeingmachines

MASTER WARN

MASTER CAUT

Emirates



seeingmachines

Emirates

Random Line Crew Selection

(Courtesy of the schedulers)

seeingmachines

Data Gathering

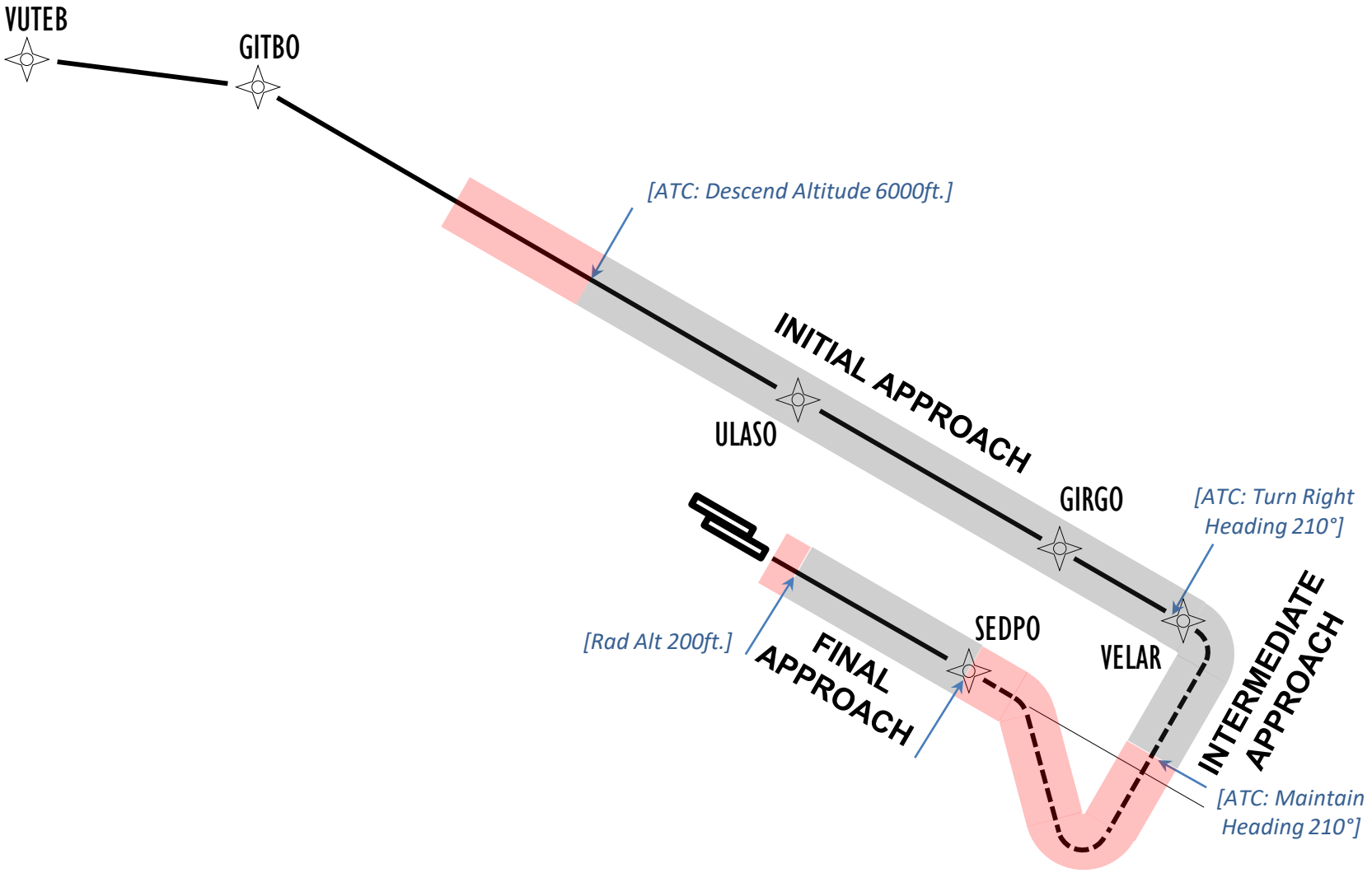
Emirates

seeingmachines

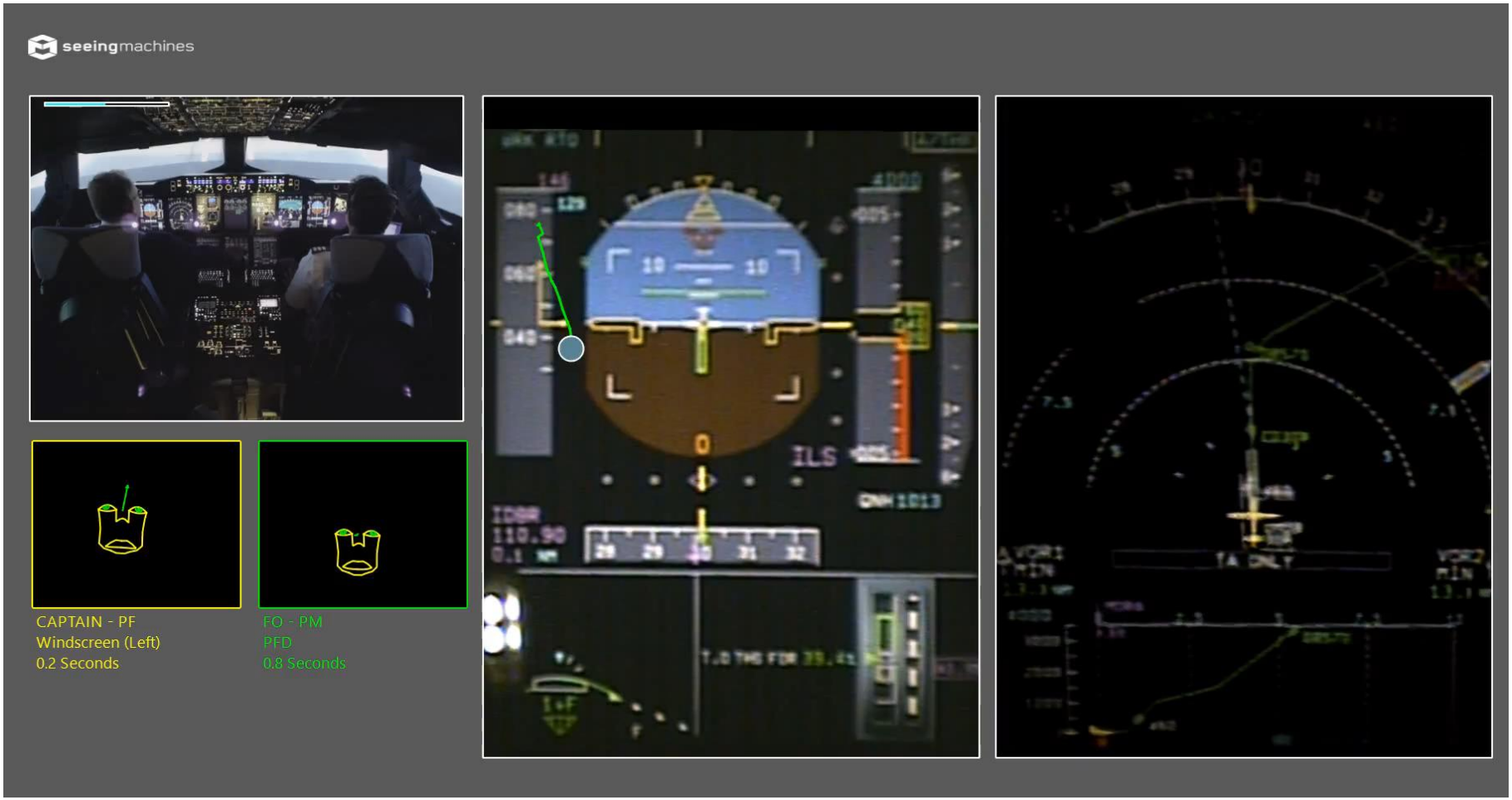
Analysis

Emirates

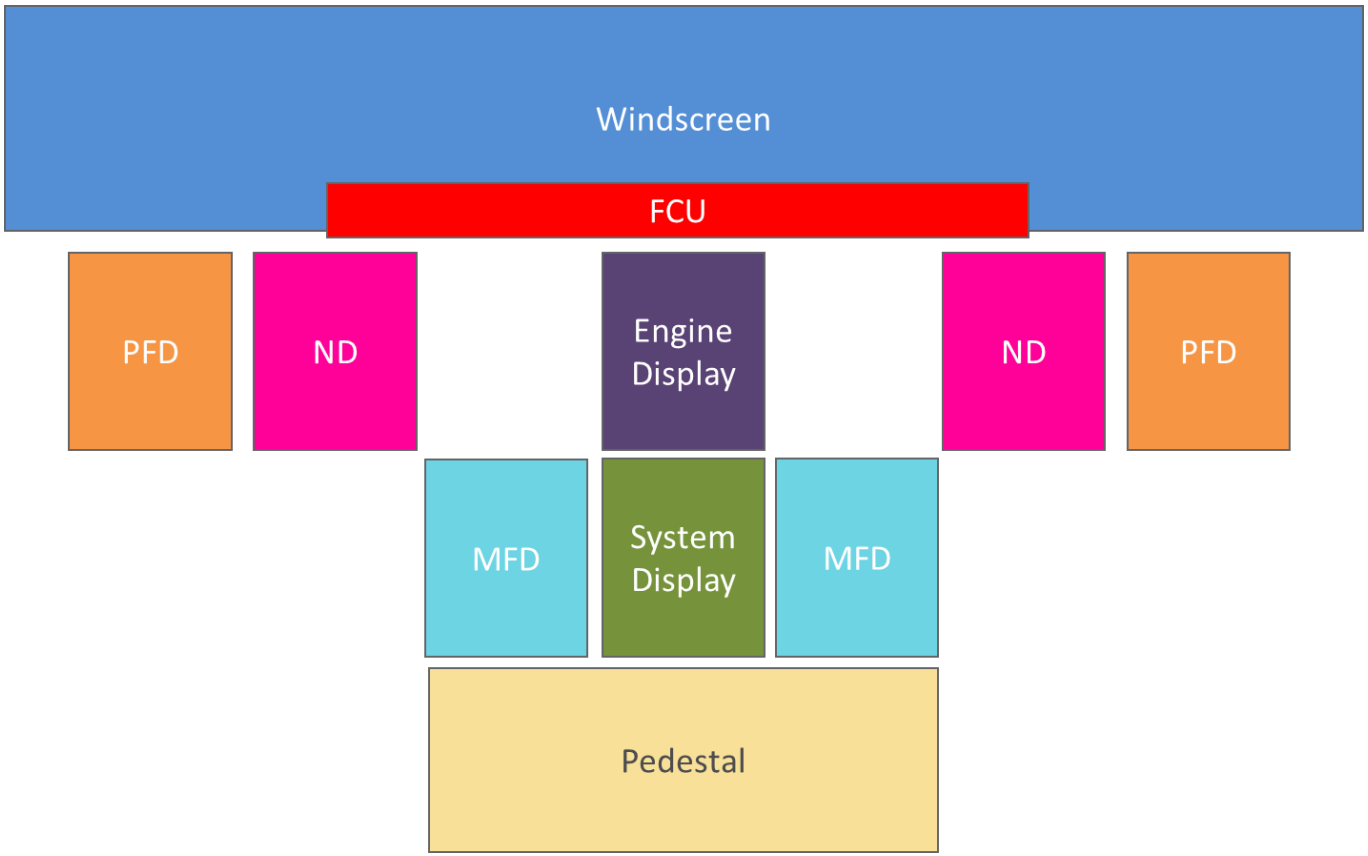
Approach Analysis



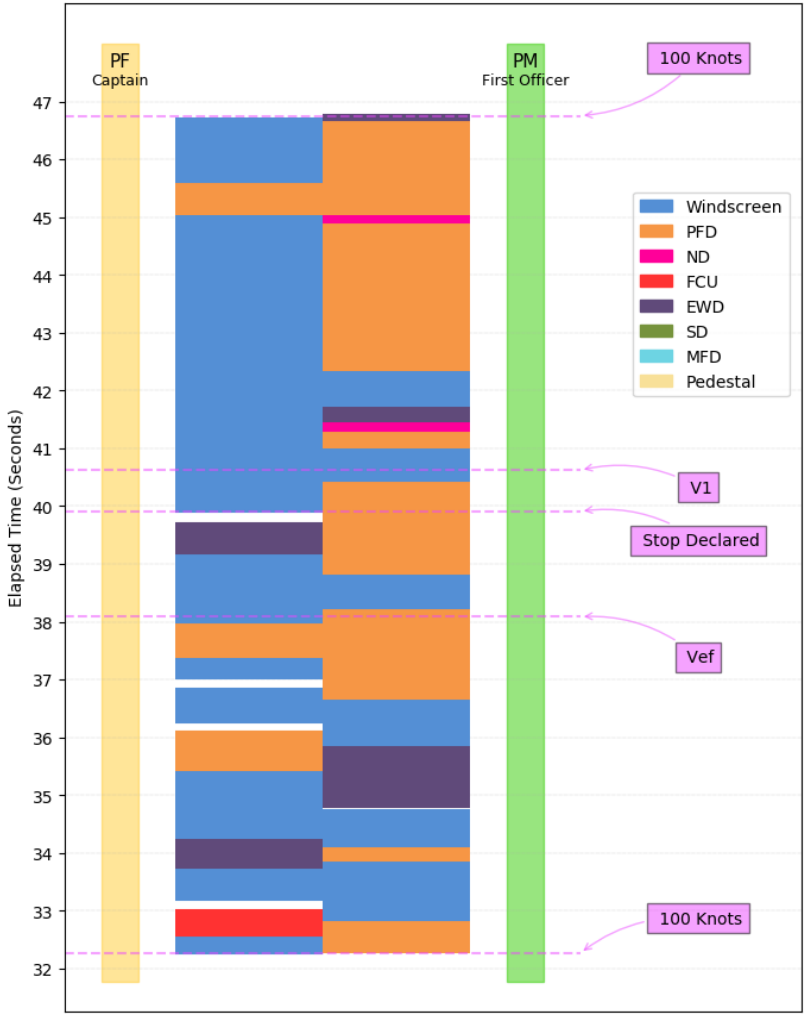
A380 FFS, Results - real time

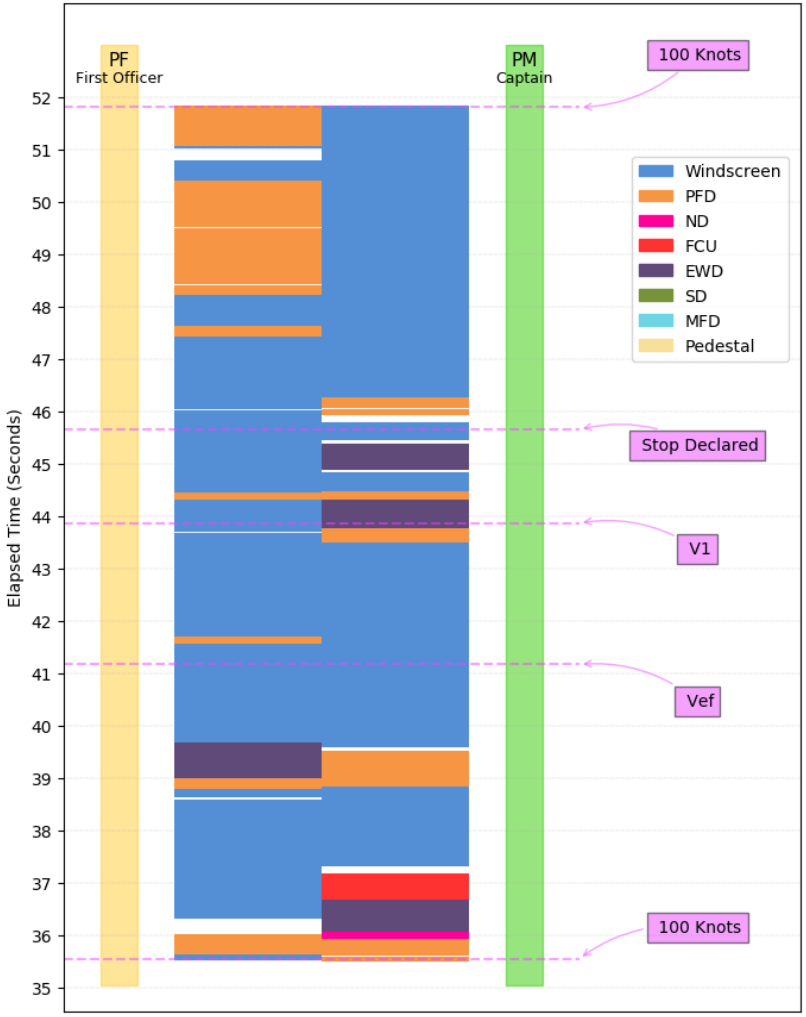


Results – Regions of Interest



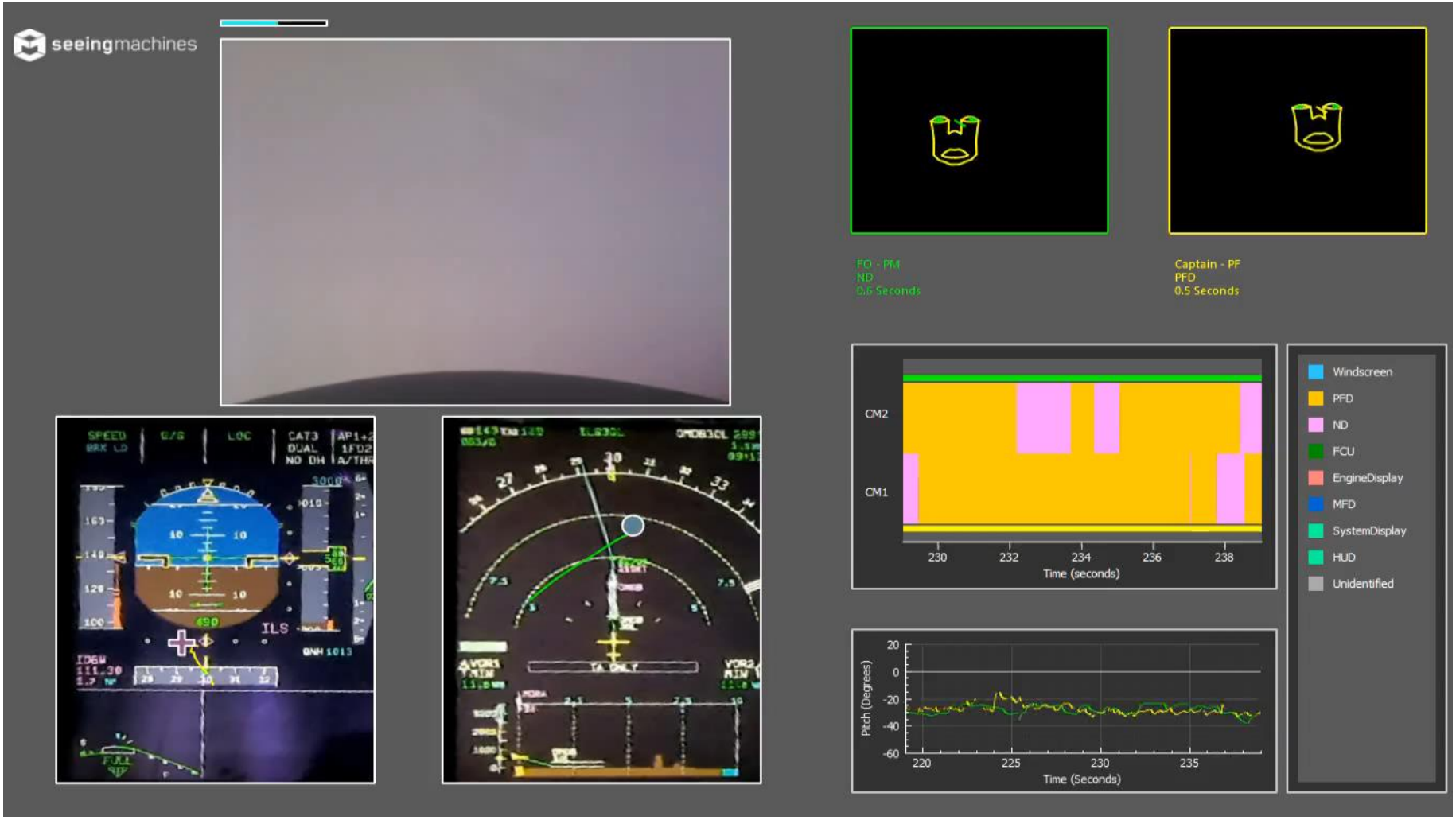
Results – ‘Candybar’ examples





A380 Landing, Focus – end of runway

A380 Low Visibility Operations



seeingmachines

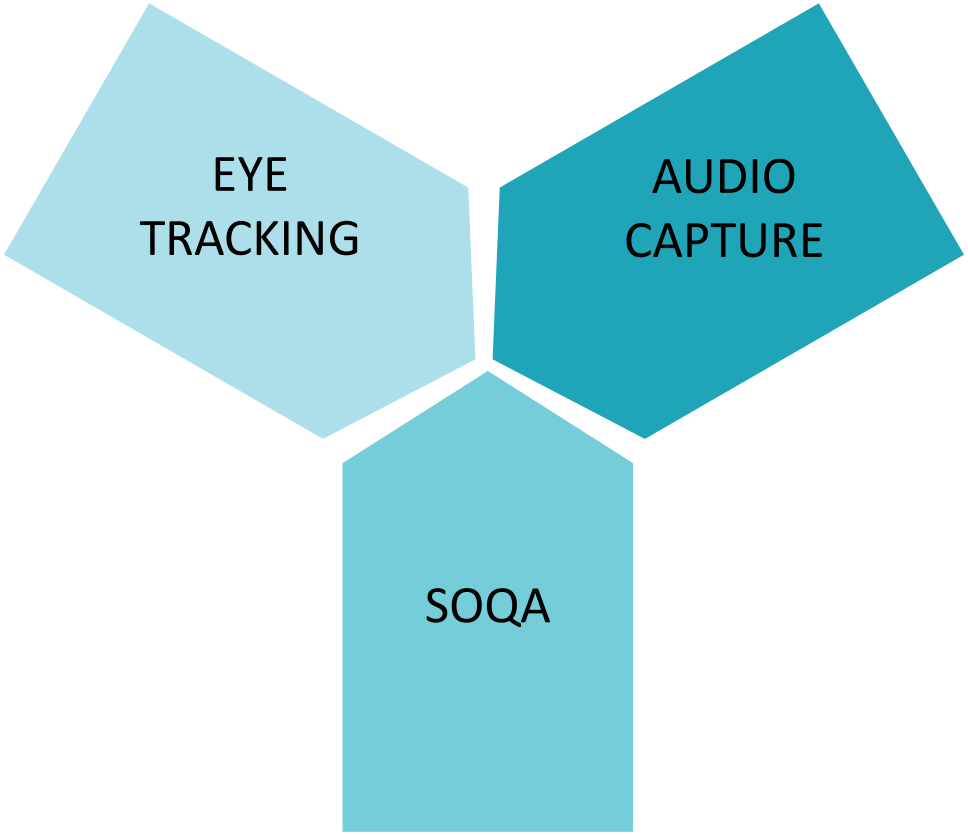
B737 HGS (HUD) Proof of Concept

Emirates

seeingmachines

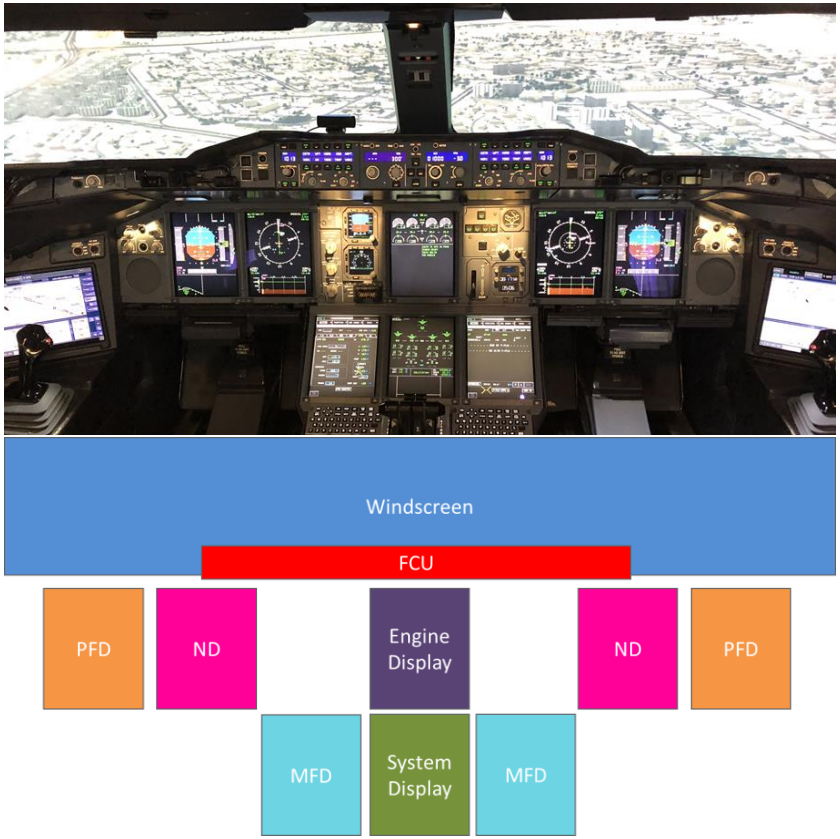
Emirates

Product Integration

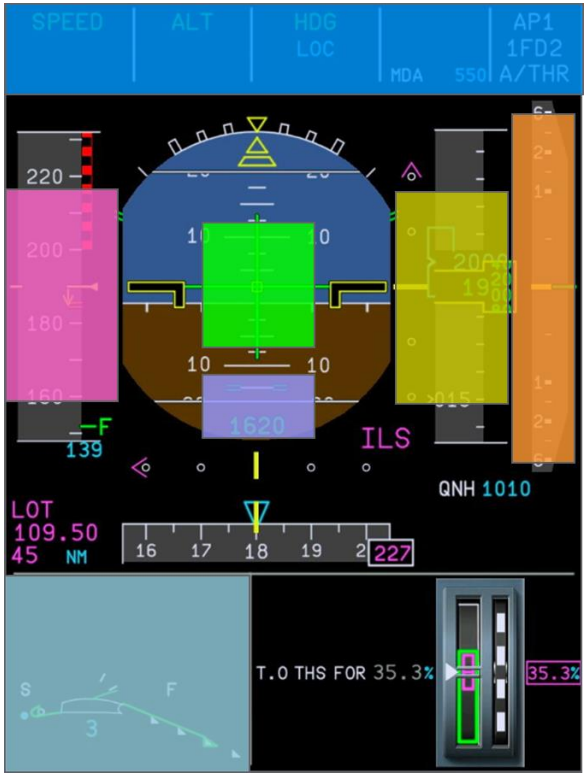


Debriefing Tool, Attention Classifier

Macro (Cockpit)



Micro (PFD or HUD)



Where is this going?

- Corrective training
- SOP Compliance
- Testing of procedural change
- Measuring and defining “Competent”…
- …therefore getting live ‘gap analysis’ of trainee to “competent”.
- EBT data – trend analysis, making training more efficient.

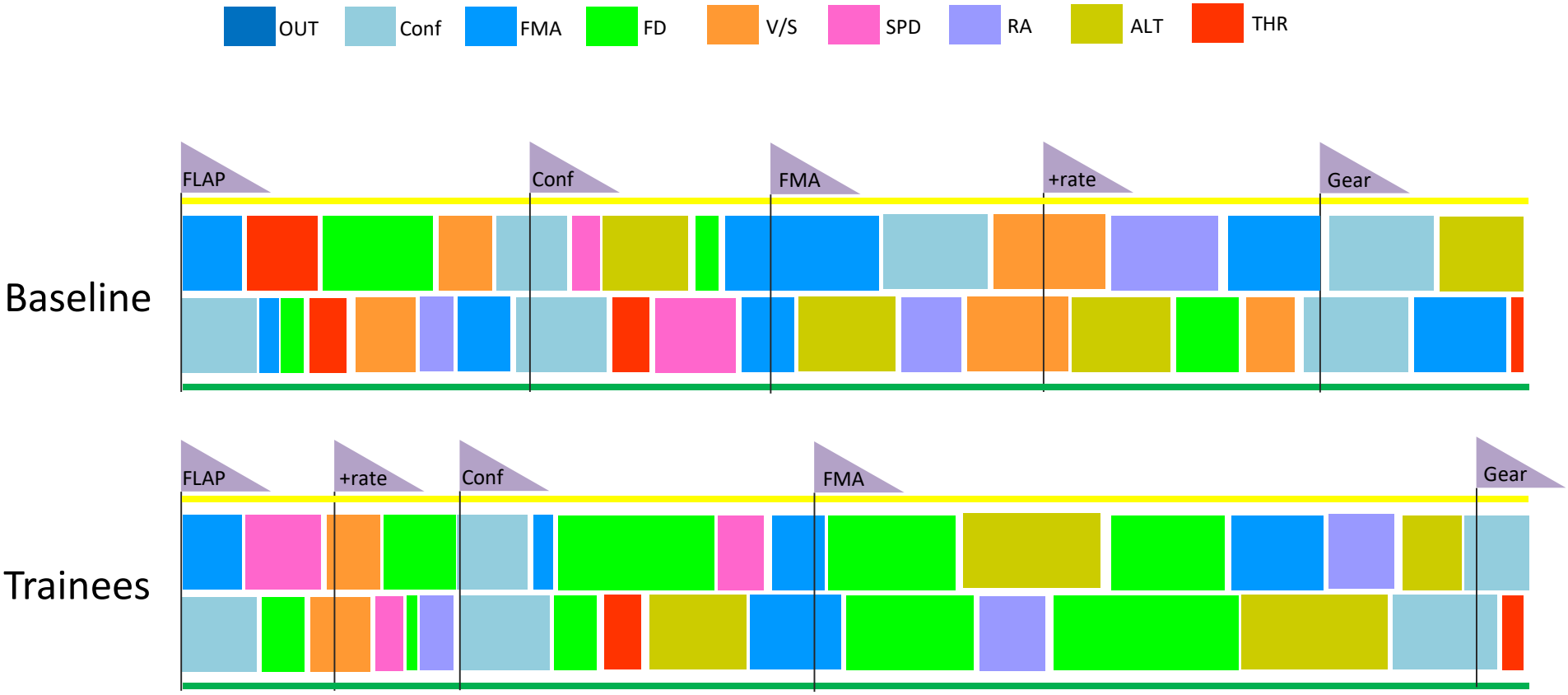
seeingmachines

“Low hanging fruit”

Emirates

Sequence	Focus / Scenario	Detail	SOP or Technique
1a.	FMA	Mode Change	SOP
1b.	FMA	‘Checked’	SOP
2.	Configuration	Flaps, Gear, SPD BRK	SOP
3a.	Inside / Outside	PF / PM, less than 200’	Technique
3b.	Flare – TDZ or EoR	PF / PM, less than 100’	Technique
4.	Autoland	PM, less than 200’	Technique - PM
5.	Go Around	G/A Sequence	SOP
6.	Take Off	T/O Sequence	SOP
7.	Stabilisation	SOP Criteria, FL, Speed, Config	SOP
8.	Taxi Navigation	PF / PM Onboard Nav System	Technique
9.	Flight Director	FD Fixation	Technique

The future…
Simulator ‘hot’ debriefing tool



seeingmachines

Thank you!

Emirates