Dedicated to innovation in aerospace

Managing Startle & Surprise
PACDEFF 2016

Edzard Boland

A KLM and NLR project, commissioned by EASA

Flight operations

Making the world of transport safer, more sustainable and efficient

NLR

Universities

The practical application of science

Dedicated to innovation in aerospace

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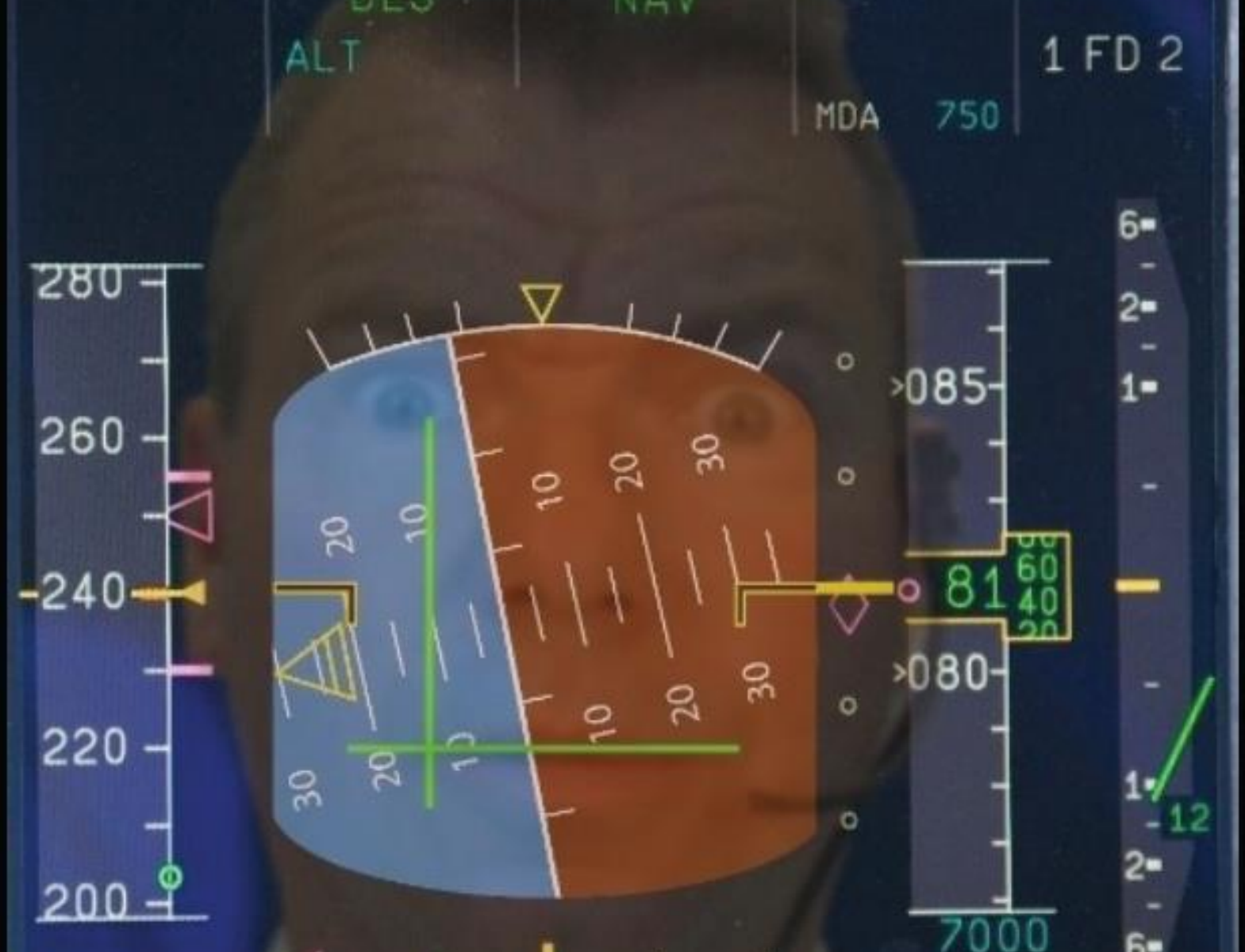
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Non-Technical skills have been here for years…

Can we expect performance in 3 without training in 1?

1	2	3
Feelings Emotions	Communication Conflict mngt.	Situation Awareness Decision Making
EMOTIONAL skills	SOCIAL skills	COGNITIVE skills

Do we need this?

Did these aircrew perform brilliantly? No.
The more important question is: can we blame them?

Do not blame the crew

Aviation wisdom

Remember these...?

- Enjoy the failure
- Look at the big picture
- Sit on your hands
- No procedure? Use common sense

Great tips & tricks but NOT training

Startle and Surprise training

Startle & Surprise training is *NOT*…

- *UPRT*
- *Scenarios*
- *Startling/Surprising pilots*

Startle and Surprise training

Startle & Surprise training IS about…

practicing skills that help pilots deal with ANY unexpected situation

Startle and/or Surprise?

Startle

- An intense, sudden stimulus (bang, flash, shock)

Surprise

- Expectations ≠ Reality

Not Startle but Surprise is the No. 1 problem in aviation

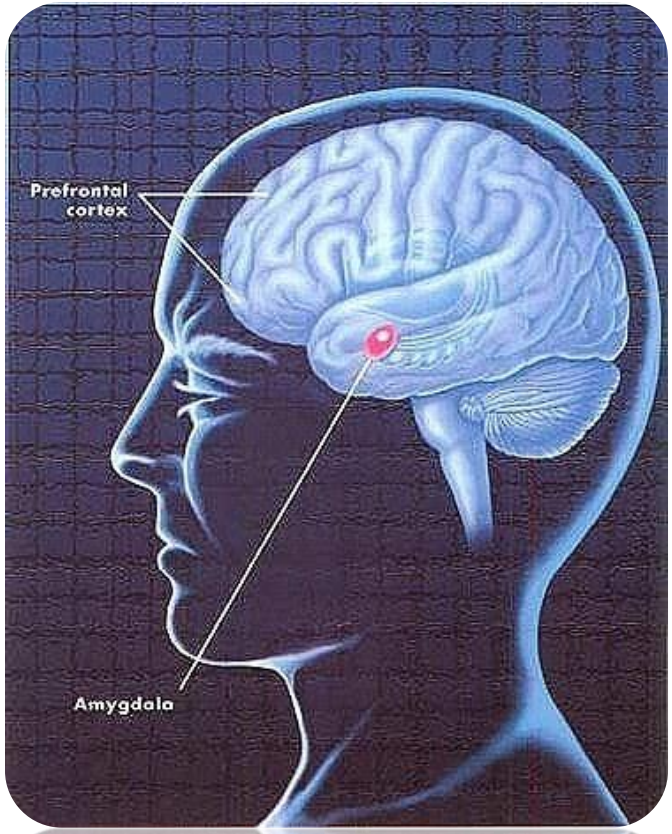
Hoax radio transmission at Melbourne airport forces plane to abort landing

Police investigate 15 incidents of illegal interference with air traffic control broadcasts at Melbourne and Avalon airports

A Virgin Australia flight en route from the Gold Coast to Melbourne was forced to change course under the instruction of a hoax caller. Photograph: Bloomberg via Getty Images

Surprise!

Startle & Surprise - Reactions

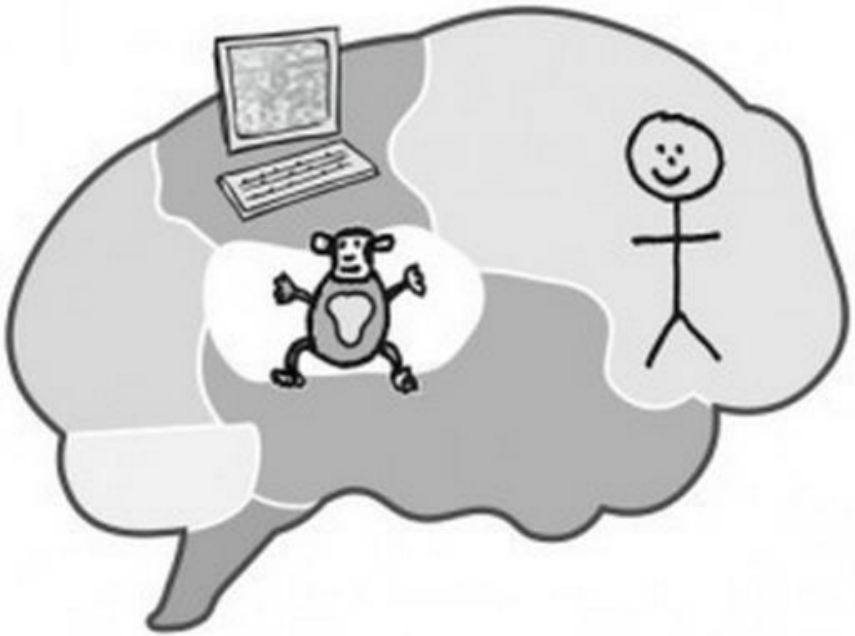


- Physiological
- Emotional
- Behavioural

Behavioural reactions

A Solution – Keep your chimp under control

Before starting up the computer-brain, we invest some time in consciously controlling the amygdala/chimp brain to prevent performance decrease or jumping to conclusions.



Aviation learning from other domains

Sport

The Military

Startle & Surprise Effect Management Training

Three step approach

Relax

Observe

Confirm

Relax

Relax
Observe
Confirm

- **Take physical distance**
- **Breathe**
- **Relax muscles**
- **Check colleague**

Observe

Relax
Observe
Confirm

1. Call out observations

What do/did we see, hear, smell, feel?

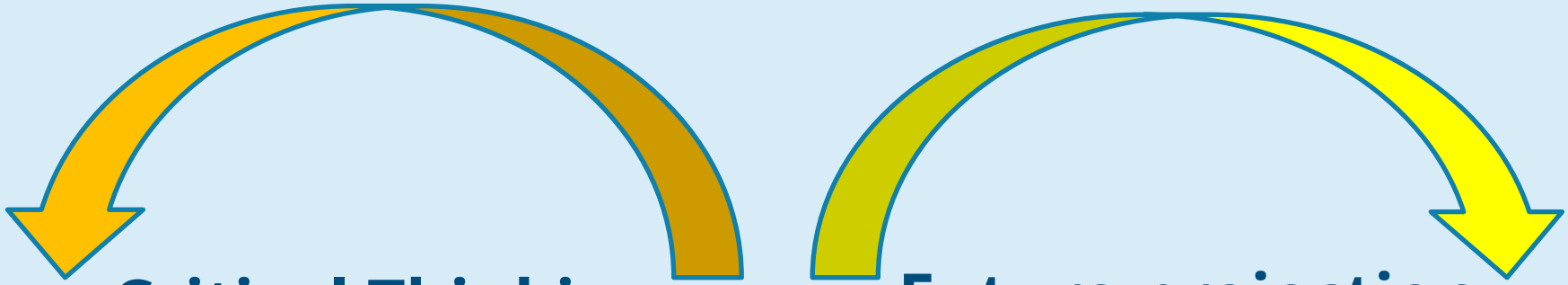
2. Interpretation

Based on our observations the most likely conclusion is….

Confirm (current & future situation)

Relax
Observe
Confirm

Structured desicion making (DODAR, DESIDE) supported by Critical Thinking & TEM.



- Is that true?
- How sure are we about this?
- Can we back up this single source of information?

Priorities?

Relax
Observe
Confirm

Priority 1:

- Safe flightpath

- Personal safety

In all other circumstances or after managing Priority 1:

Priority 2:

ROC

to prevent wrong intuitive behavior

Results from the evaluation

Training evaluation trials

44 KLM flight crew members

- Including 22 Instructors

Short-haul: B737-NG

Long-haul: B747-400

Observations

ROC-technique is trainable

- 70% used full-ROC in the simulator

Classroom training only is not enough

- Large delta on ‘calling out observations’ and ‘checking of colleague’

Effect on preventing ‘jumping to conclusions’

- Large delta pre-test vs post-test in taking time to observe before interpretation

Pilots:

Liked the training

- (average rating: 8/10)

Felt that it helped them

- (average rating: 3/4)

Intended to use it in the operation

- (average rating: 3.5/4)

Pilot Follow-up

Increased awareness of startle & surprise effects

Shared the training experience with colleagues

50% experienced some startle or surprise

- 5 used the technique in the operation
- 9 used the technique in training

Transfer of Training!

Conclusion of research…

Trials at KLM positive for Pilots, and effect of training

Results presented to EASA, GM published in 2017

KLM intends to include training in the next year

Business Case; Safety ⬆ and Operational costs ⬇

Summary

- Many accidents/incidents with Startle/Surprise-factor.
- If you do not train people to deal with Startle and Surprise, how do you expect them to deal with it?
- Successful evaluation in research of A solution.
- Simulator is only used as a ROC training environment, scenario outcome is irrelevant.
- **Invest in instructor training!** This is the single most important factor influencing success or failure of a training program.

Next?

Research: personal stress management techniques used by pilots and athletes

Dedicated to innovation in aerospace

Fully engaged

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