Managing Startle & Surprise
PACDEFF 2016
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A KLM and NLR project, commissioned by EASA
Flight operations

NLR

Universities

The practical application of science

Making the world of transport safer, more sustainable and efficient
Non-Technical skills have been here for years...

Can we expect performance in 3 without training in 1?

1. Feelings Emotions
   EMOTIONAL skills

2. Communication Conflict mngt.
   SOCIAL skills

3. Situation Awareness Decision Making
   COGNITIVE skills
Did we need this?

Did these aircrew perform brilliantly? No.
The more important question is: can we blame them?
Do not blame the crew
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 & 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
Startle & Surprise - Reactions

- Physiological
- Emotional
- Behavioural
Behavioural reactions

Fight or Flight

Startle & Surprise Effect Management
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

- Goal Setting
- Visualization
- Self Talk
- Arousal Control
Startle & Surprise Effect Management Training
Three step approach

Relax
Observe
Confirm
Relax

- Take physical distance
- Breathe
- Relax muscles
- Check colleague
1. **Call out observations**
   What do/did we see, hear, smell, feel?

2. **Interpretation**
   Based on our observations the most likely conclusion is....
Structured decision making (DODAR, DESIDE) supported by Critical Thinking & TEM.

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

**Future projection (TEM)**

**Confirm (current & future situation)**
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 ↓
• 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.
Research: personal stress management techniques used by pilots and athletes
Fully engaged
Netherlands Aerospace Centre

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