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Through a Glass Darkly: safety at the pilot-controller interface

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RAES HUMAN FACTORS CONFERENCE 26- 27 NOVEMBER 2015
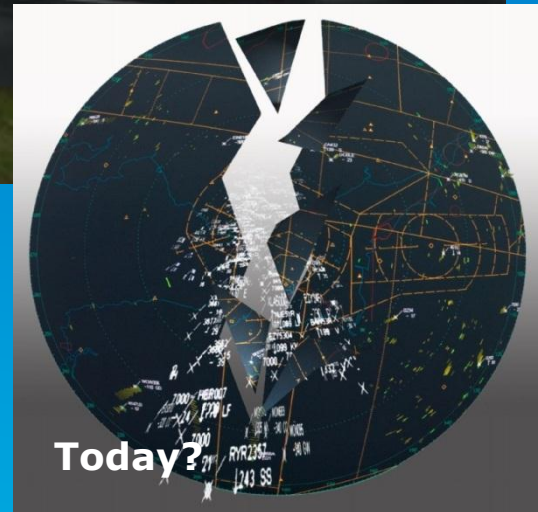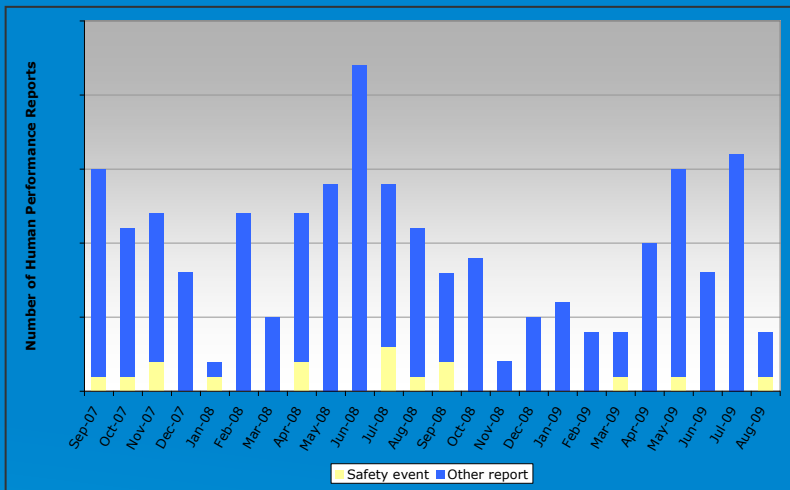
- You can't predict an accident?
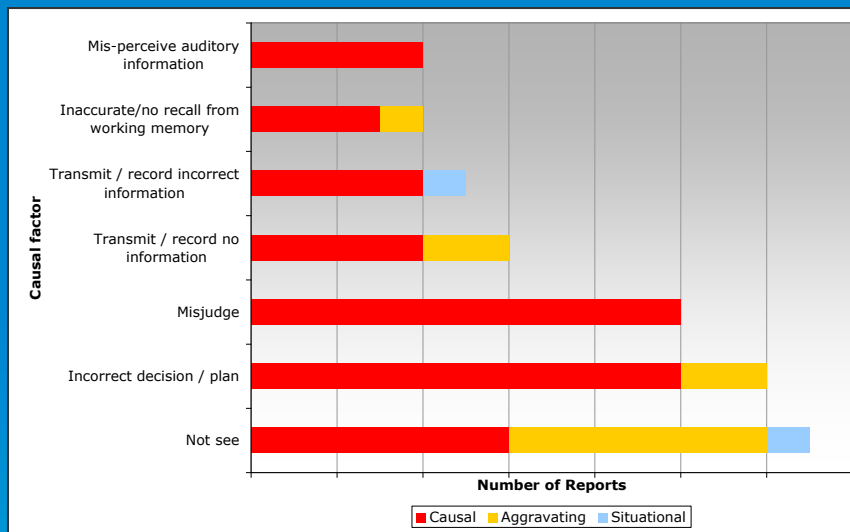

1956

2002

1977

Today?

Tracking trends over time

Counting the causal factors tells you what was involved

Identifying frequently occurring Causal Factors

But we must be smarter about knowing WHY?

If we don't consider the whole system, from planning to shutdown, then we will never retain our safety reputation

The CONTEXT is probably the most important thing!

An important part of this system is the pilot/controller interface

>53% risk

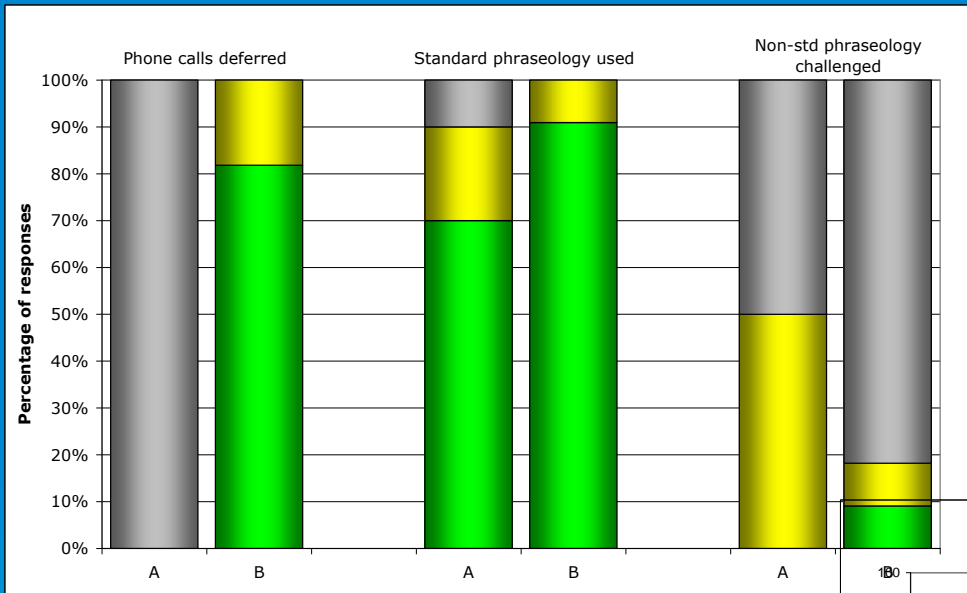# A good predictor of safety at this interface is to watch and listen to the most relevant tasks and behaviours

Day 2 Day Safety Surveys

Observing what goes well

- as defined by the operational staff
- as observed by trained operational staff
- using standard observational criteria
  which are positive

Courtesy of © BAA Limited

Results are simply graphed

Making comparisons – after improvement activities
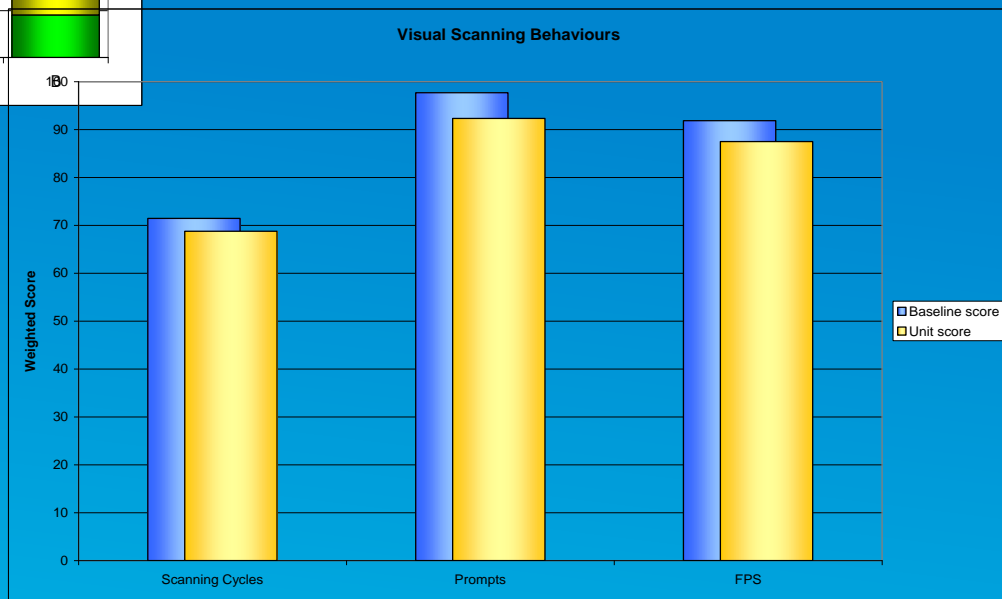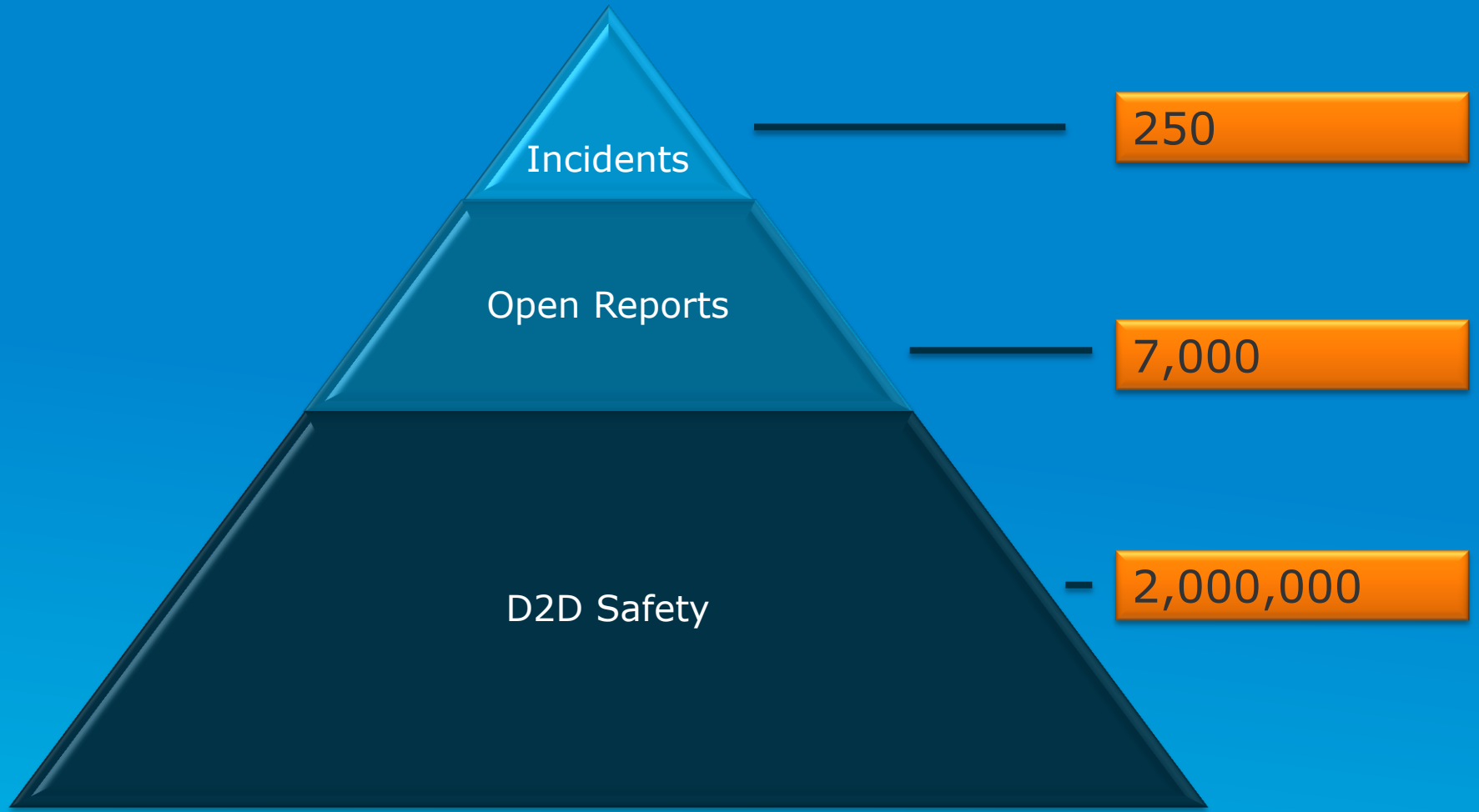
Day 2 Day Safety Survey Activity

Day 2 Day Safety Surveys

In 8 years of data gathering we now have robust evidence that the results from this programme correlate with the causal factors found in our incident investigations

Safety Surveys on the flight-deck - FLOSS

Flybe - Level Busts per 100,00 Movements
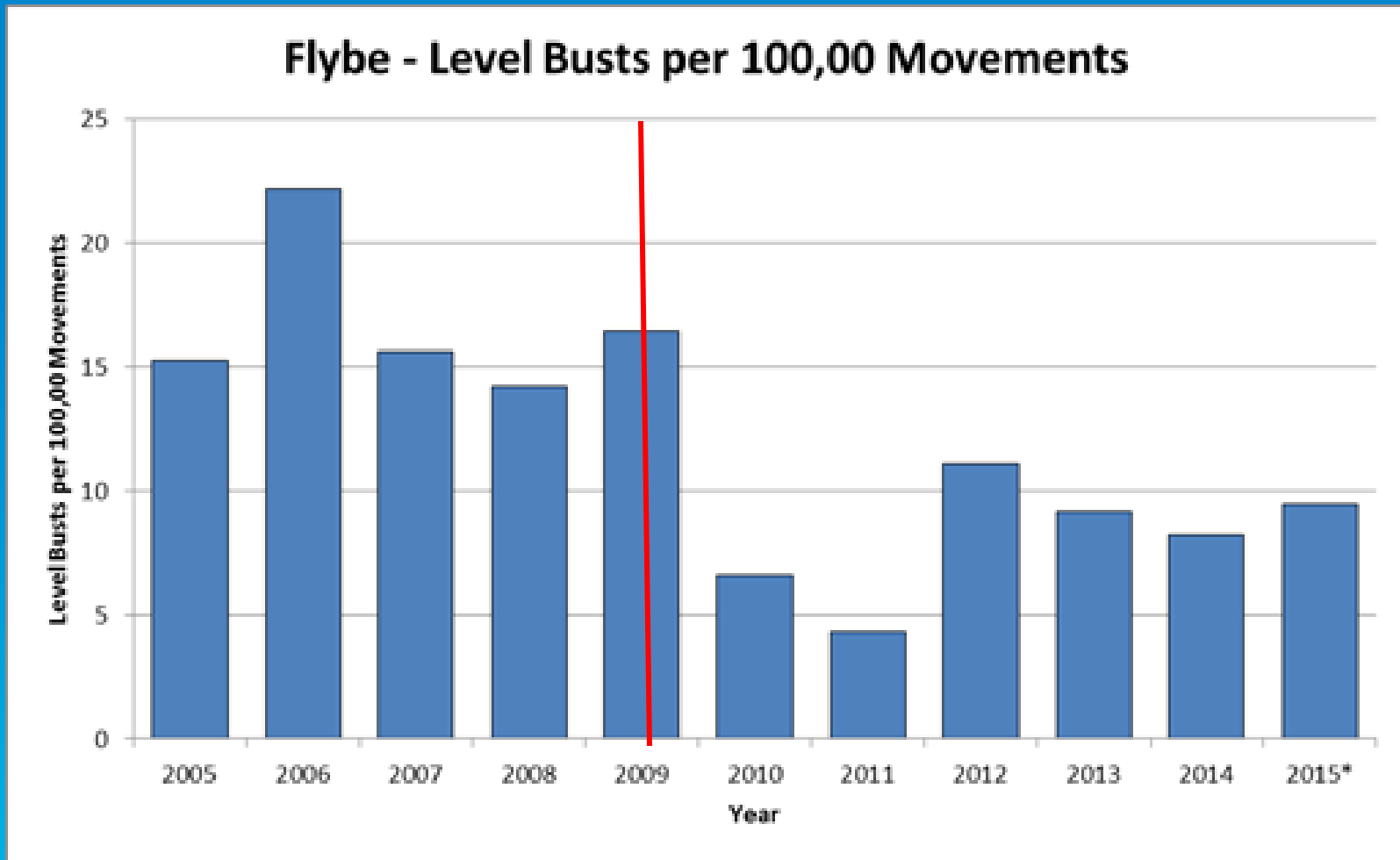
Captain Chris Coney-Jones FRAeS
November 2015

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FLOSS (D2D) AND SMS 2

A collaborative initiative with NATS

EASASMS 2 / Safety 2:

- Predict the events before they happen

- We don't want to be investigating the event when it has become an accident!

- Reporting of hazards and near misses to build a picture of where operational risk lies

D2D (FLOSS):

- Safety survey looking at the good things and how well we do them

- Looking at the efficacy of safety barriers

- Looking at adherence and understanding of known good practices

Controller / pilot interface:

- A different language (TRM vs CRM) – breakdown the barriers

- TRUCE days

  – Conditional clearances

  – 'Descend', 'descend now' and 'descend when ready'

- Altimetry and subscale settings

  – Flight deck workload

  – Multiple instructions

ALTITUDE EXCURSIONS

Altitude Bust verses Altitude Deviation

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Overview:

- 63 flight observations in total with specifically trained observers sat on jumpseat

- Specifically generated assessment criteria

- 35 (56%) scheduled observations were carried out on the Ejet fleet and 28 (44%) on the Q400 fleet

- Represents <14% of Flybe's daily flying program

	Pilot Flying	
	Captain: 29	FO: 34
EJET	16	19
Q400	13	15

> Experience on type (yrs):

Q400	CPT	FO
0-2 yrs	4	12
3-6 yrs	9	16
7+yrs	15	0

EJET	CPT	FO
0-2 yrs	1	13
3-6 yrs	19	20
7+yrs	15	2

> Other contextual information:

	Yes	No	Blank
Distractions	21%	79%	0%
Weather	10%	90%	0%
Callsign Confusion Issues?	5%	92%	3%
Any frequency delay?	14%	83%	3%
Sterile Flight Deck Rules Used?	70%	24%	6%
Terrain Display on?	97%	2%	2%

> If Sterile Flight Deck Rules not used during:

	Not Used
Ground	9
Climb	3
Descent	4

Climb Behaviours (II)

63 observations

eJET Comments
- Not used for alt selections. (CDG - MAN)
- Good SOP compliance. (BHX - GLA)
- Good use of 'one click'. (LYS - BHX)
- Change (Alt set knob) reminded by PM (MAN - ABZ)
- Mostly (MXP - MAN)
- All (BHX)
- Not changes (x2). (MAN - CDG) (GLA - BHX)
- (BHX - LYS) (BHX - EDI)
- (EDI – MAN) (MAN - MXP)

Q400
- (BHD)
- Used done slowly and methodically
- Not used on
- Used for Alt and and course (EMA – BHD)
- Using Alt one click was
- Used for altimeter selections
- Not used for HDG selection. (EXT
- HDG Bug, spurn around, Pitch wheel
- No step climbs. (BHD - MAN)

Climb — One click procedure

Comments
- upted by ATC. (MAN - EDI)
- errupted checks. (MXP - MAN)
- (x3). (EXT - MAN) (MAN - DUS) (MAN - AMS)
- after starting after take off checks. Good restart (MAN - MXP)
- without reference to the checklist.

Q400 C
- PF held the ck in, checks actioned straigh
- Part of the climb
- Checklist items are com errupted. (BHD - MAN)
- Checks are interrupted to answ restarted before checking in with
- Checklists are not interrupted howeve is reduced and the crew are speaking to performed from the cx-list. (MAN - BHD)
- Checklist ask for within 1 to go (after T/O cx) and finishing off in the level off phase. (LCY - EXT)

Climb — Checklists

mments
- hallenge and response (x7). (MAN - EXT) (MAN - DUS) (MAN - DUS) (AMS - MAN) (BHX - BOD)
- (BHX)
- (BHX - GLA)
- (MAN - MXP)
- remain (x11). (BHX - LYS) (CDG - MAN) (JER (MAN - DUS) (DUS - MAN) (MAN - ABZ) (ABZ
- Not real

Q400 Comments
- PF does not have DUB - EXT)
- PF does occasionally ed by PM. (LCY - EXT)
- The finger is removed from check the level. (DUB - EXT)
- Finger of PF is not left on the FGC cross checked. (EXT - DUB)
- Immediately selected by PF with ALT ed, however finger/hand does not remain on FGP. (EXT - NCL)
- PF finger does not keep finger on FGP until ged by PM. (MAN – BHD)

Climb — FGC new levels

AIR SAFETY REPORTS

Post report analysis conducted by the Flight Safety Team

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Total number of altitude busts by month Jan 14-Oct 15
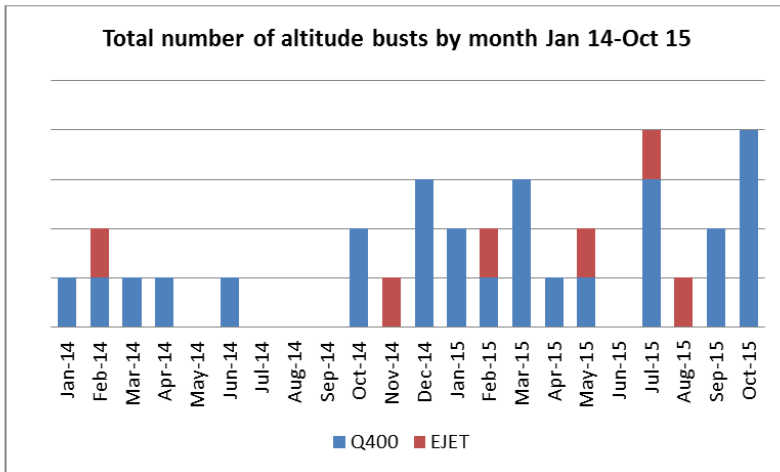
- Events numbers over time
- Considering both fleets
- Identify trend looking at attrition / training
- Procedural changes
- Seasonal variation and weather phenomena
- ATC interaction
- Distraction / complacency

- Known causal factors
  - Aircraft systems
  - Aircraft / controller operational procedures
- Procedural resilience
- Perceived workload; "challenge & threat" states
- Geographic location
- Flight phase
- Altitude i.e. above / below MSA, QNH or FL

Reasons for altitude busts Jan14-Oct15

Captain experience in seat on type Jan 14-Oct 15
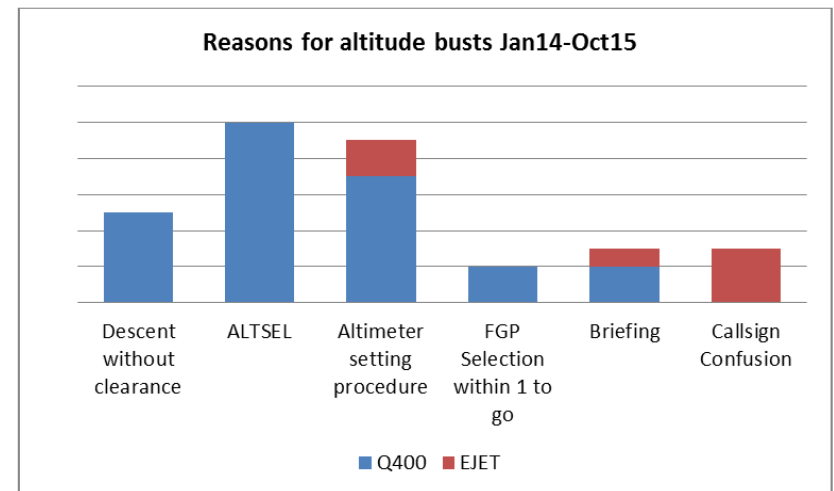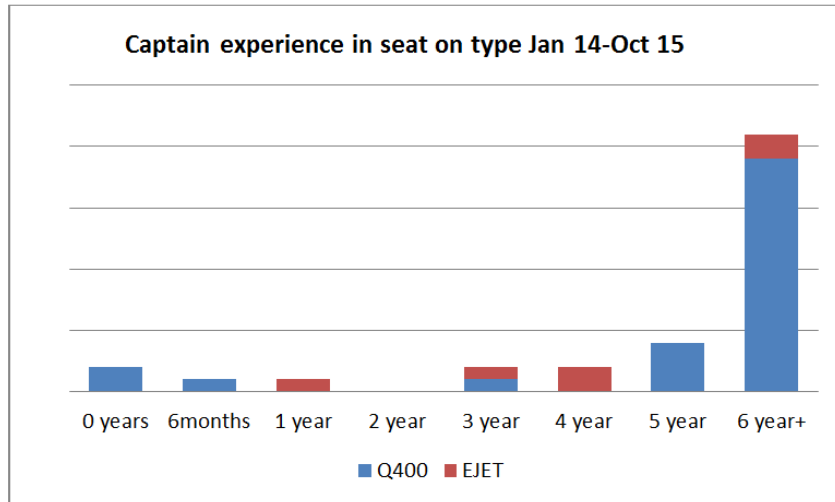
- Captains
- Experience in seat; however, the experience on type analysis shows similar trends
- Curve shifts ≈ 2 years left for other monitored errors

- First Officers
- Initial learning errors
- Monitored during training and for a period post sign off
- Curve shifts left by ≈ 1 year for other monitored errors

First Officer experience in seat on type Jan14-Oct15
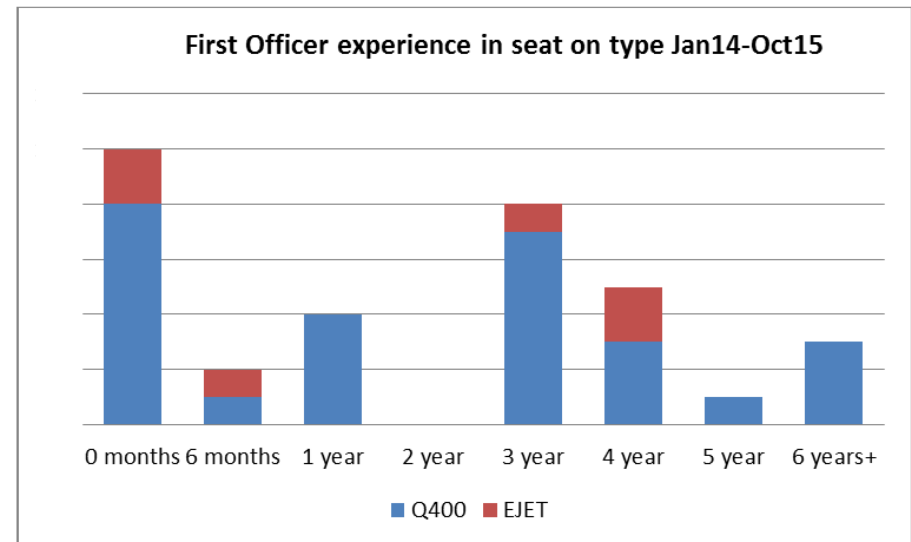
TRAINING – THE KEY

Inclusion of specific scenarios in training packages

Train the trainer to evaluate and tailor package for experience levels

Work closely with NATS as the issue is not confined to the radar or the flight deck

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QUESTIONS?

Thank you.

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