Altitude Deviations

STEADES In-depth analysis

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Agenda

- High Level Analysis Outcomes
- In-depth Analysis
  - Altitude Deviation Context
  - Altitude Deviation Contributing Factors
  - Altitude Deviation Recognition and Response
  - Altitude Deviation Outcome
- Conclusion

High level analysis: Summary

Event Backgrounds

- The majority of altitude deviations occurred during the descent (41%) and approach (19%) phases
- The top three contributing factors for all altitude deviation events were identified as
  - Flight Management
  - Air Traffic Management and
  - Weather

Event Effects

- Majority of altitude deviation events were successfully managed and did not have further effect on the flight
- 13% of reports coded with immediate effects, of these:
  - 68% Flight Path Deviation – Lateral
  - 7% Avoidance Maneuver

In-depth Analysis: Overview

Data set:

- Random data sample comprising 369 ASRs
- Q1 2013 to Q4 2013 incl.

The random data sample was built on the assumption that throughout all operators reporting to STEADES an “altitude deviation” is understood as the same type of event

Objective:

- Analyze ASRs from STEADES database for Altitude Deviation related items in the predefined areas:
  - Context
  - Contributing Factors
  - Recognition and Response
  - Outcome

In-depth analysis: Limitations

Methodology:

- In-depth analysis includes reading and categorizing each ASR
- Quality, content and information of ASRs vary depending on information submitted by the flight crew
- Information typically included in ASRs
  - Altitude, pilot duties, outcome

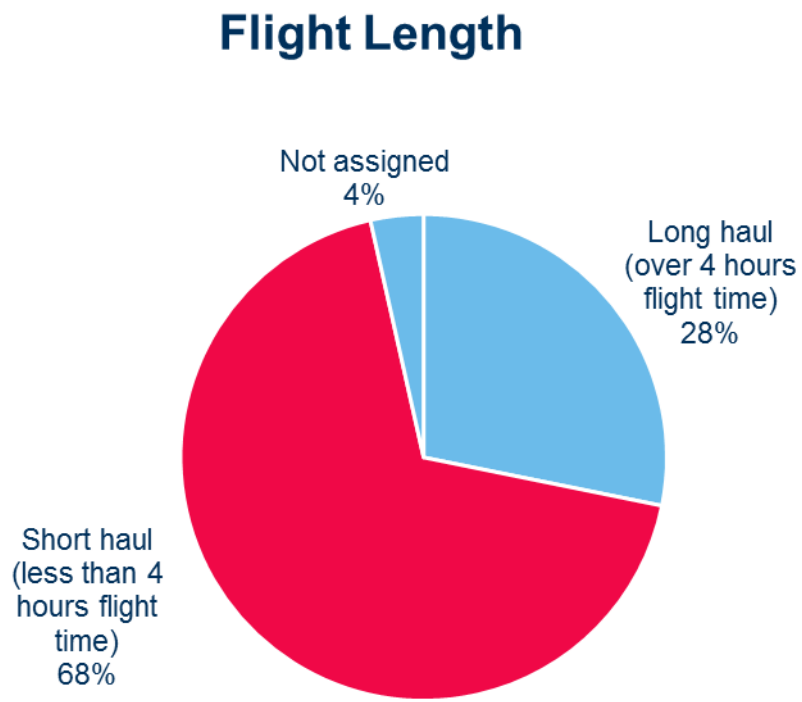
Managing Limitations:

- Due to the limitations some sections of the analysis are based on relatively small proportions of ASRs
- Type of normalization of the random data sample limits regional analysis

Altitude Deviation

CONTEXT

Context: Flight Length



96% (356 rpts)

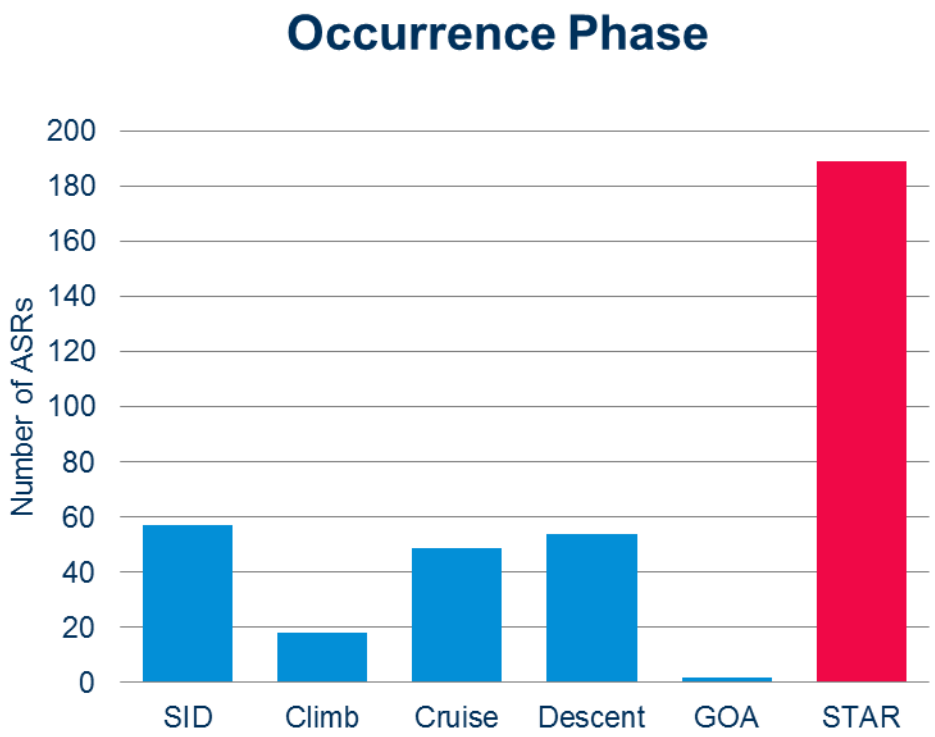
of overall dataset contained information about flight duration

68% Short haul

28% Long haul

Context: Occurrence Phase

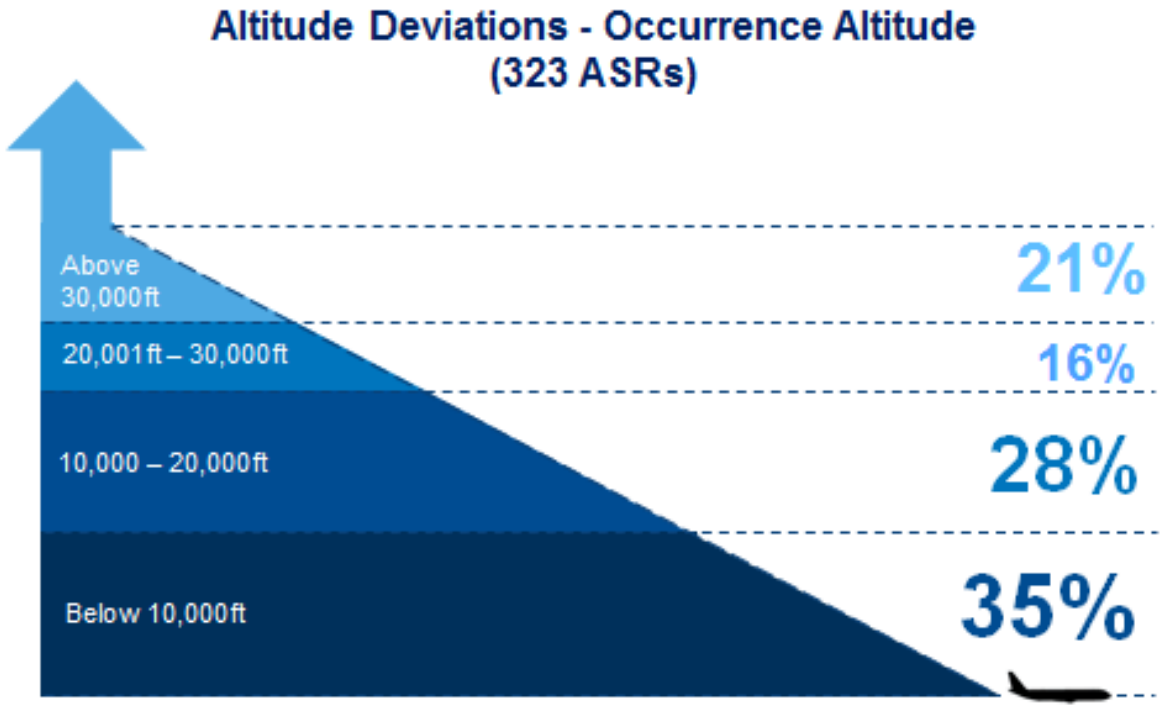
100% (369 rpts)
of overall dataset contained information about occurrence phase



51% during STAR

15% during SID

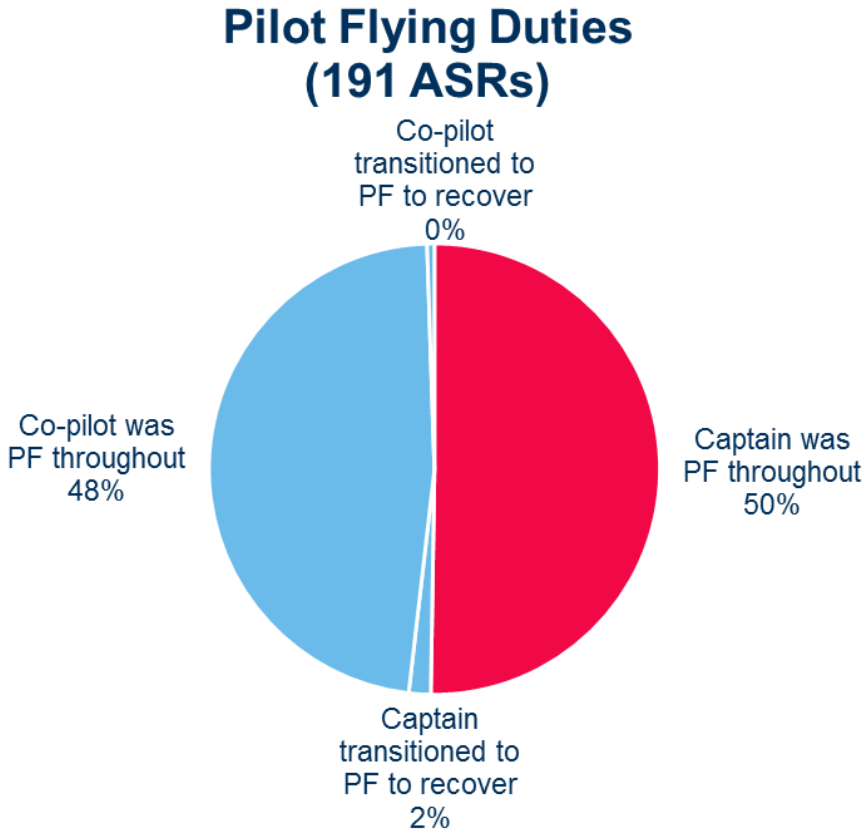
Context: Occurrence Altitude



88% (323 rpts)

of overall dataset contained information about occurrence altitude

Context: Pilot Duties



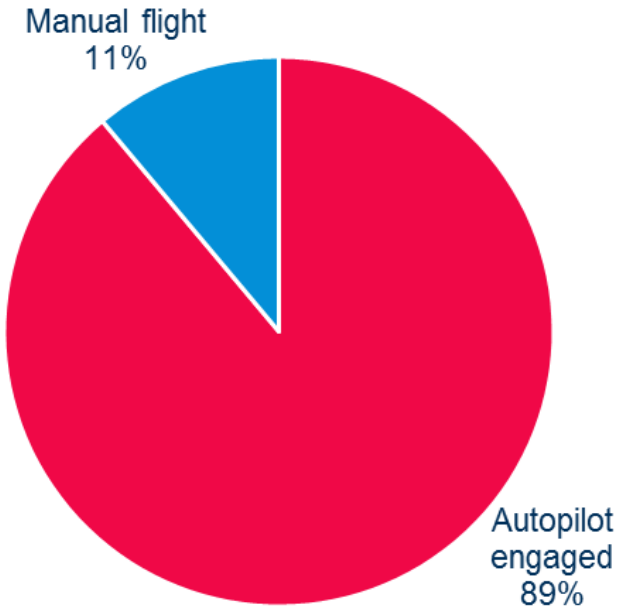
52% (191 rpts)
of overall dataset contained information about pilot duties

50% Captain

50% Co-pilot

Context: Automation

Automatic or Manual Control (171 ASRs)



46% (171 rpts)

of overall dataset contained information about automation

89% Autopilot

11% Manual

Context: ATC Aspects

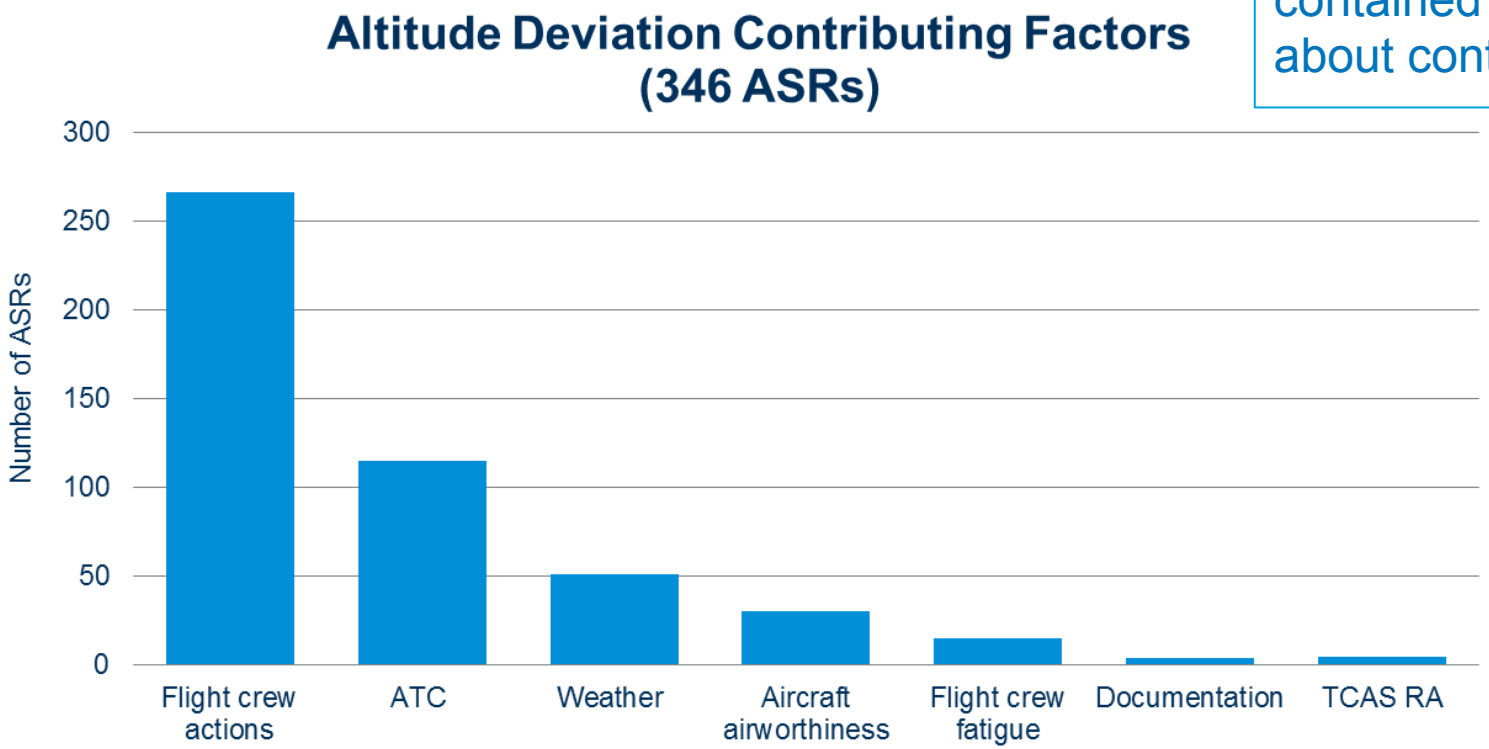
- A vast majority of STEADES ASRs are reported by the flight crew. Therefore, the narratives offer only flight crew perspective on altitude deviations regarding the context. Further information of ATC related aspects will be covered under the Contributing Factors and Recognition and Recovery parts of the analysis.

Altitude Deviation

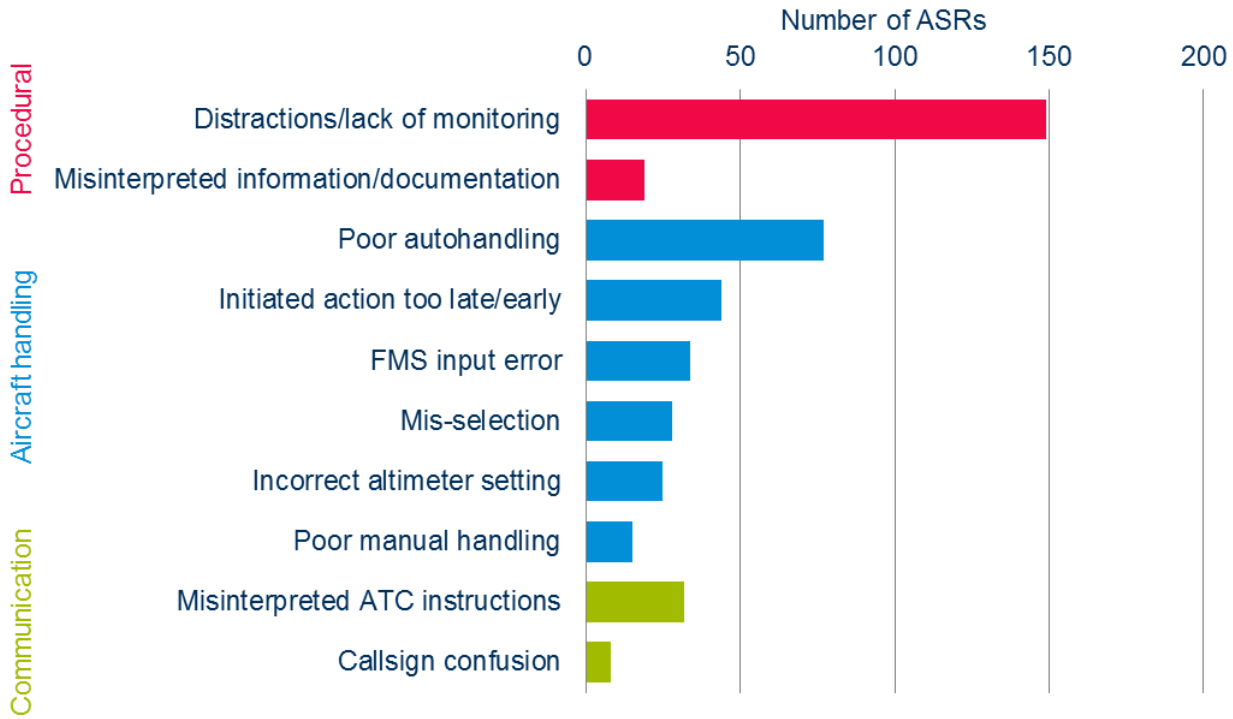
CONTRIBUTING FACTORS

Contributing Factors:

94% (376 rpts)
of overall dataset contained information about contributing factors



Contributing Factors: Flight Crew Actions

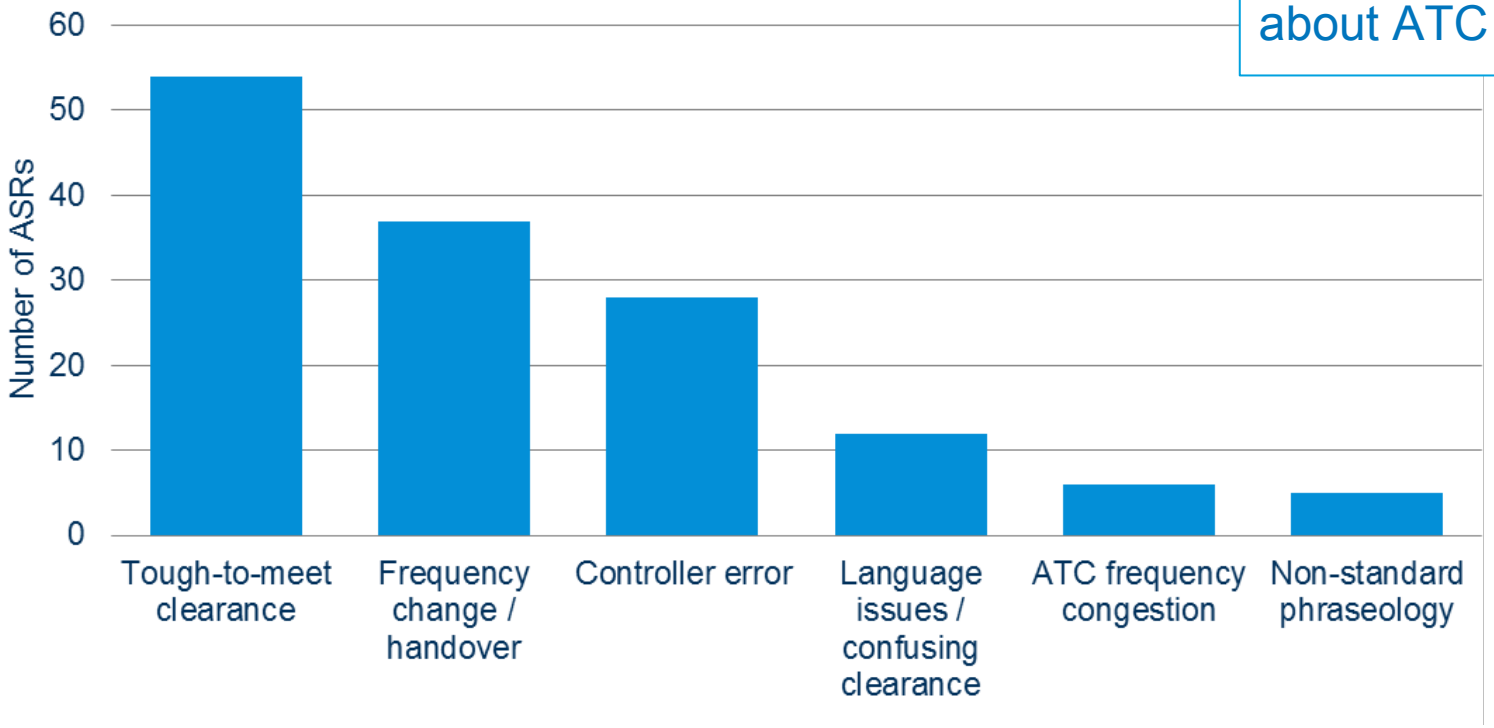


72% (266 rpts)

of overall dataset contained information about flight crew actions

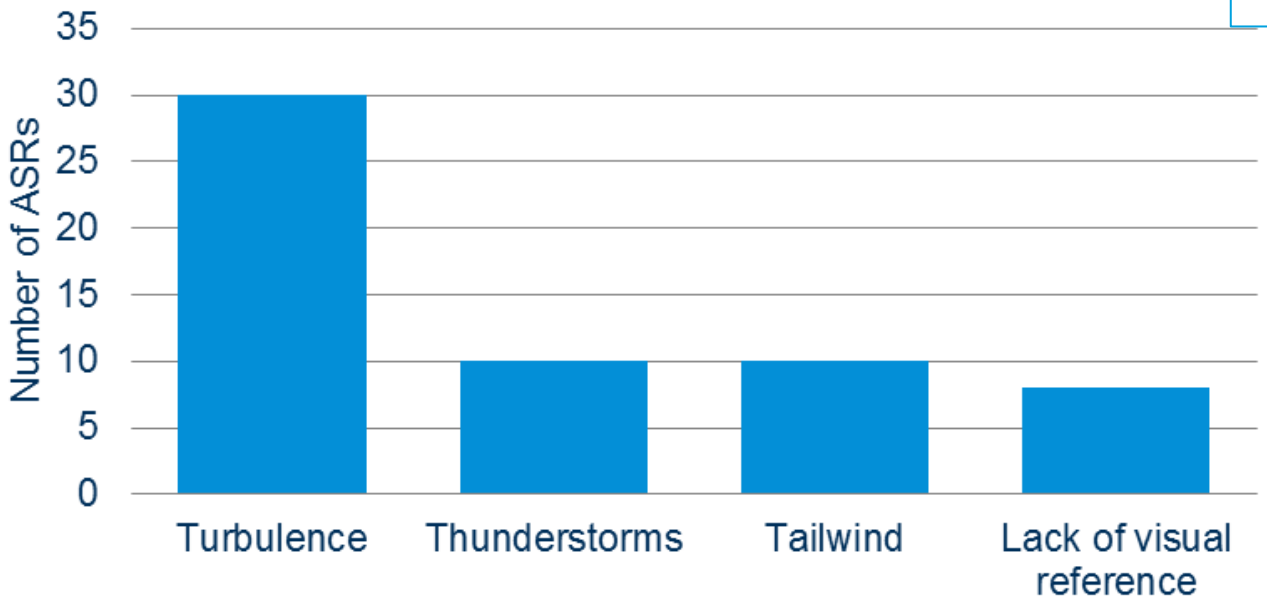
Contributing Factors: ATC

31% (115 rpts)
of overall dataset contained information about ATC factors

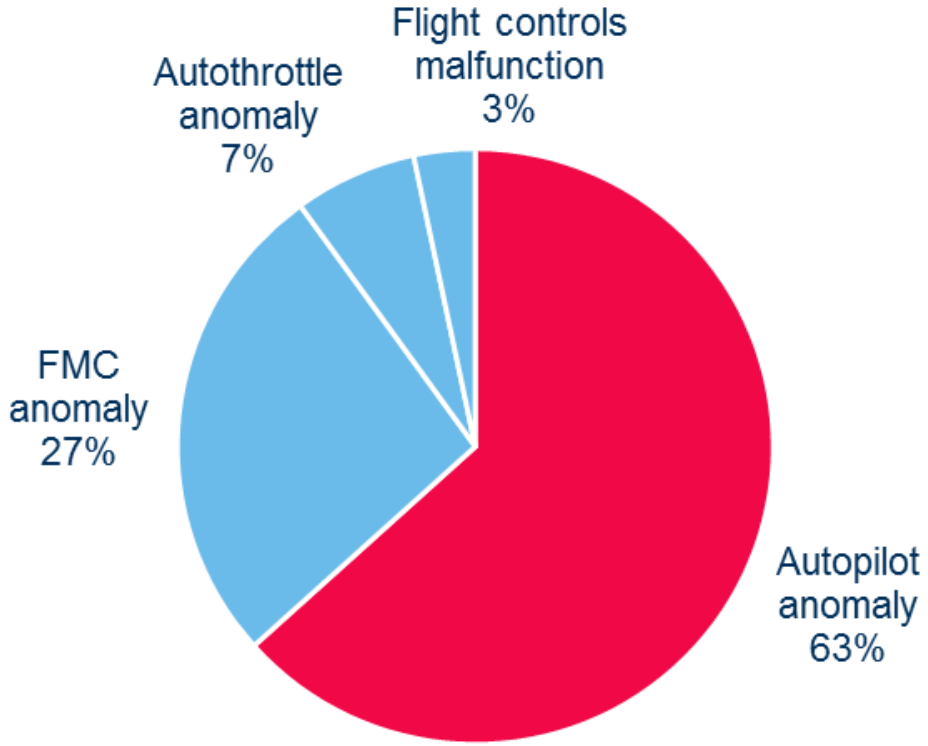


Contributing Factors: Wx

14% (51 rpts)
of overall dataset contained information about weather



Contributing Factors: Airworthiness



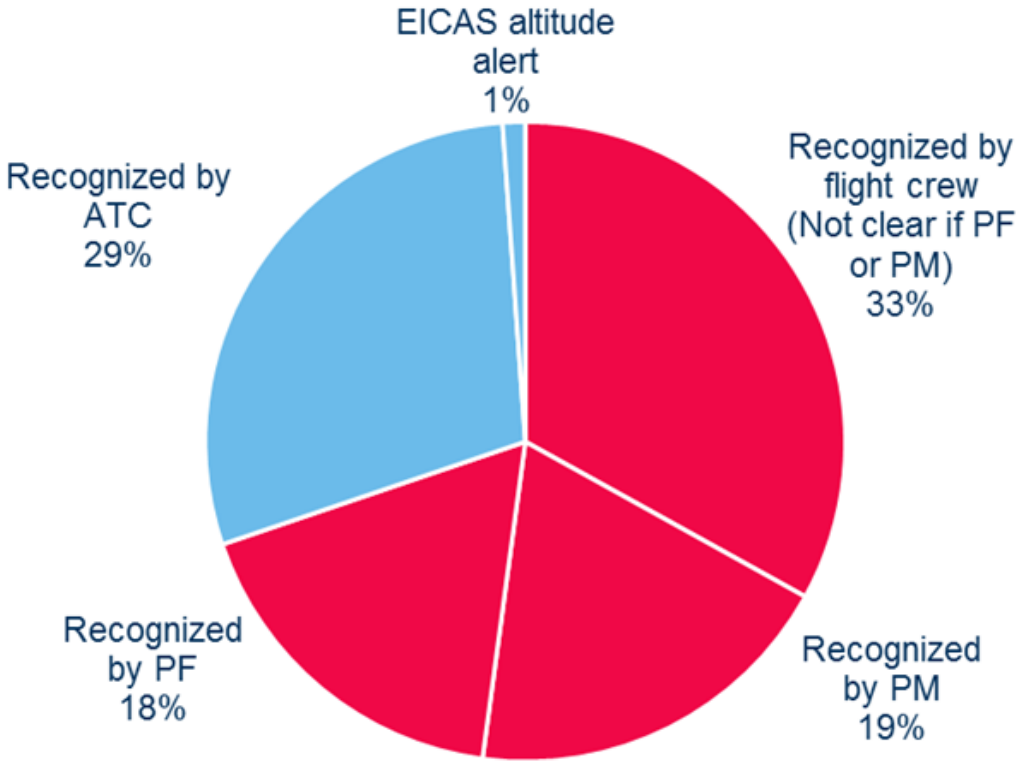
8% (30 rpts)

of overall dataset contained information about technical issues

Altitude Deviation

RECOGNITION AND RESPONSE

Recognition and Response: Recognition

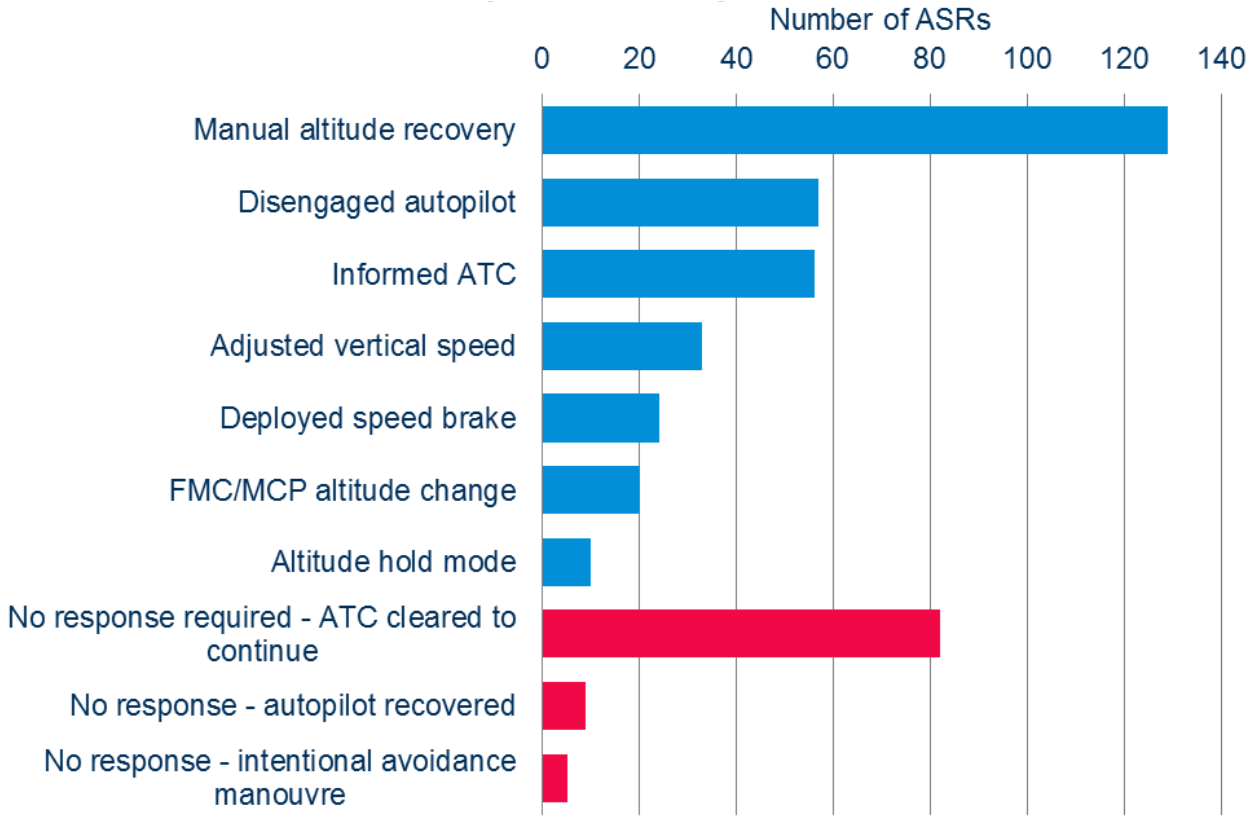


70% Flight Crew

29% ATC

95% (351 rpts)
of overall dataset contained information about recognition

Recognition and Response: Response



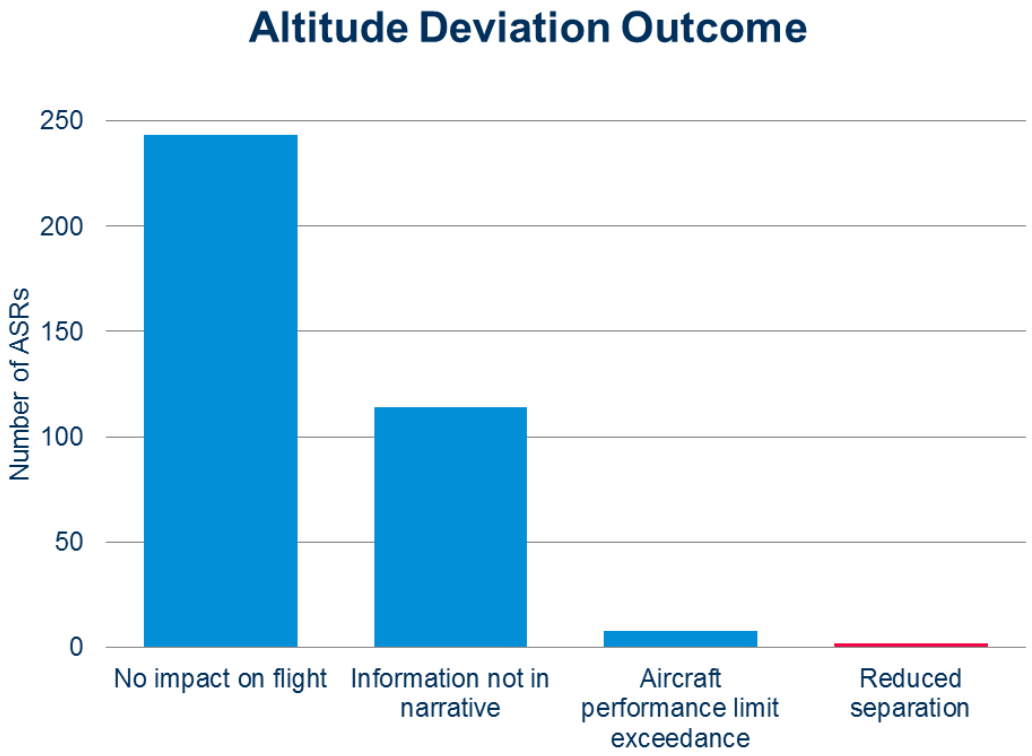
69% (256 rpts)

of overall dataset contained information about response

Altitude Deviation

OUTCOMES

Outcomes:



69% (253 rpts)

of overall dataset contained information about outcome

67% No Impact

Conclusion: Context

- Majority (89%) with autopilot engaged
- Majority during standard departures or arrivals
- Majority above FL100
- Equally split between captain and first officer

Conclusion: Contributing Factors

Prime Contributing Factors:

- Flight crew distractions
- Deficiencies in automation management
- Unclear instructions from ATC
- Turbulence

Conclusion: Recognition and Response

- Flight crews recognized most altitude deviations
- Crews corrected promptly and correctly in most cases
- ATC was able to issue a new clearance in many cases

Conclusion: Outcomes

- Most reported no impact on the flight
- 0.5% of reports indicated reduced separation as a result of the altitude deviation

For information on this or any other
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to represent, lead and serve the airline industry