

A photograph of several corporate jets flying in formation, viewed from a low angle. The image is overlaid with a semi-transparent blue geometric shape that frames the text on the right. The jets are white with dark accents, and their landing gear is visible.

Corporate Jets Safety overview

June, 2016

Analysis period and scope

- **Accidents, Serious incidents and high severity occurrences**
 - In the UK or involving UK-registered aircraft
 - From 01-January-2011 to 28-June-2016
- **All reported occurrences (technical)**
 - In the UK or involving UK-registered aircraft
 - From 01-January-2011 to 31-December-2015
- **Commercial and Non-commercial operations involving**
 - Normal Category Aeroplanes (CS-23), equipped with (a) turbojet engine(s) (complex motor-powered aircraft) and
 - Large Aeroplanes (CS-25), equipped with (a) turbojet engine(s)

2015 and 2016 data is provisional and may be subject to alterations

Key Points

- From 01-January-2011 to 31-December-2015
 - 25 occurrences (accidents, serious incidents and high severity)
 - 22 in the UK
 - 17 involving non-UK registered aeroplanes
 - One fatal accident in 2015
 - Four reported occurrences in 2016 (as at 28/06/2016)
 - Predominant occurrences:
 - Loss of control in-flight (technical and/or operational);
 - Loss of control on ground (technical and/or operational) resulting in runway excursion;
 - Ground collision with obstacles or another aircraft (primarily attributable to ground services);
 - Airspace management/conflict related events, predominantly involving General Aviation operations;

Corporate Jets

Sector information



- A diverse sector, including:
 - Operation in multiple airspace classes (A to G);
 - Operation from/to multiple locations;
 - Interaction with multiple other airspace users: Part-NCO, Part-NCC Part-SPO, Part-CAT;
 - Variability of operations (Non-Commercial, Commercial operations, Aerial Work);
 - Various aircraft types available (CS-23, CS-25)

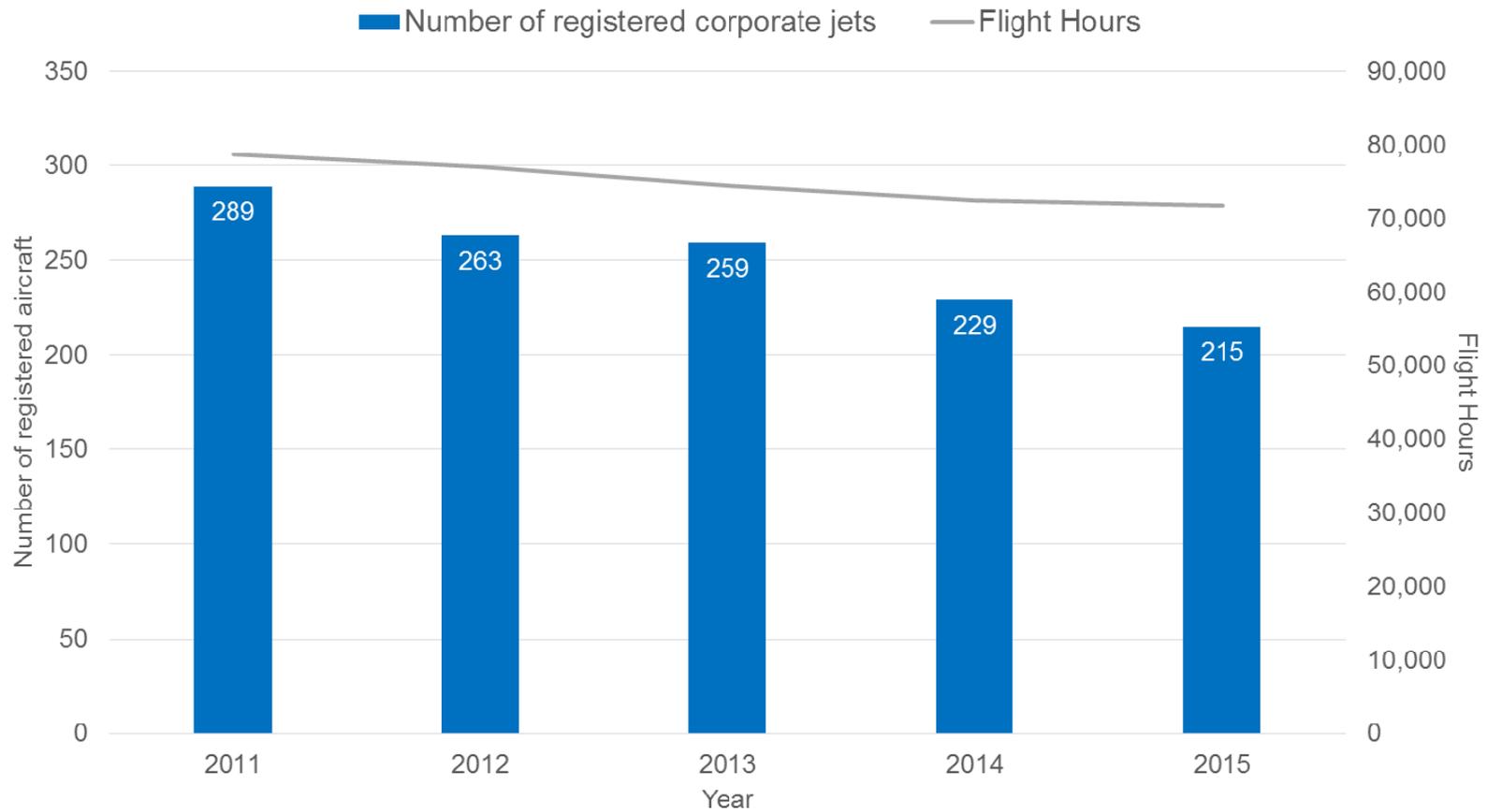
 - Approximately 215 aircraft registered in the UK in 2015
 - Approximately 72,000 flight hours flown by UK Corporate Jets in 2015
 - Equivalent to approximately 50,000 flights¹ by UK Corporate Jets in 2015
 - Does not include non-UK registered aircraft flying in the UK
-
- Note 1: Based on Business Aviation Safety Summary of Global Accident Statistics 2010-2014 – International Business Aviation Council

Corporate Jets

Sector information



UK-registered Corporate Jets



Corporate Jets

Fatal Accident Record



- In the past ten years (2006 to 2015), there have been two fatal accidents
 - Both involving foreign-registered aircraft operating in the UK
 - Last fatal accident in 2015

- 30-March-2008 – VP-BGE (State of Registry: Bermuda) – Cessna Citation 500
 - Two nautical miles North-North East of Biggin Hill Aerodrome.
 - Two persons on board fatally injured. Aircraft destroyed. Third-party damage.
 - Air Accidents Investigation Branch (AAIB) field investigation completed – [Report 3/2010](#).
 - Shortly after take-off, aircraft initiated a return to Biggin Hill after reporting engine vibration. During the downwind leg for Runway 21, the aircraft descended. The flight crew reported a major power problem just before it struck the side of a house. An intense fire developed.
 - Three safety recommendations issued.

- 31-July-2015 – HZ-IBN (State of Registry: Saudi Arabia) – Embraer-505 Phenom 300
 - Blackbushe Aerodrome, Hampshire.
 - Four persons on board fatally injured. Aircraft destroyed. Third-party damage.
 - Aircraft over-run runway on landing, collided with obstacles and got airborne momentarily before impacting with parked vehicles.
 - [AAIB bulletin S2/2015](#) published in August 2015, identifying the following:
 - Conflict with microlight during approach triggering a Traffic Collision Avoidance System Resolution Advisory (requiring pilot action).
 - Aircraft landed approximately 710 metres (m) beyond the Runway 25 threshold and approximately 349 m before the end of the declared Landing Distance Available, 438 m before the end of the paved runway surface.
 - AAIB investigation underway.

Corporate Jets

Accidents, Serious Incidents and High Severity Occurrences



- 25 occurrences during the period 2011 to 2015
 - One fatal accident in 2015

- **Loss of control in-flight – 9 occurrences**
 - Aircraft upset from technical error or malfunction
 - Aircraft upset from flight crew partial or total incapacitation
 - Aircraft upset due to preceding aircraft (e.g. wake turbulence)
 - Aircraft upset from flight crew error (automation/ manual flying)
 - Other, unknown or undetermined

- **Ground-related – 11 occurrences**
 - Resulting in runway excursion – 6 occurrences
 - Collision with obstacles or other aircraft – 3 occurrences
 - Loss of control and ground collision during landing:
 - 06-March-2014 - EC-TLC - Glasgow Prestwick - The right wing touched the runway while landing at night in a crosswind.

- **Airspace-related – 3 occurrences**
 - Potential outcome: mid-air collision
 - Predominantly in class G and en-route or during approach

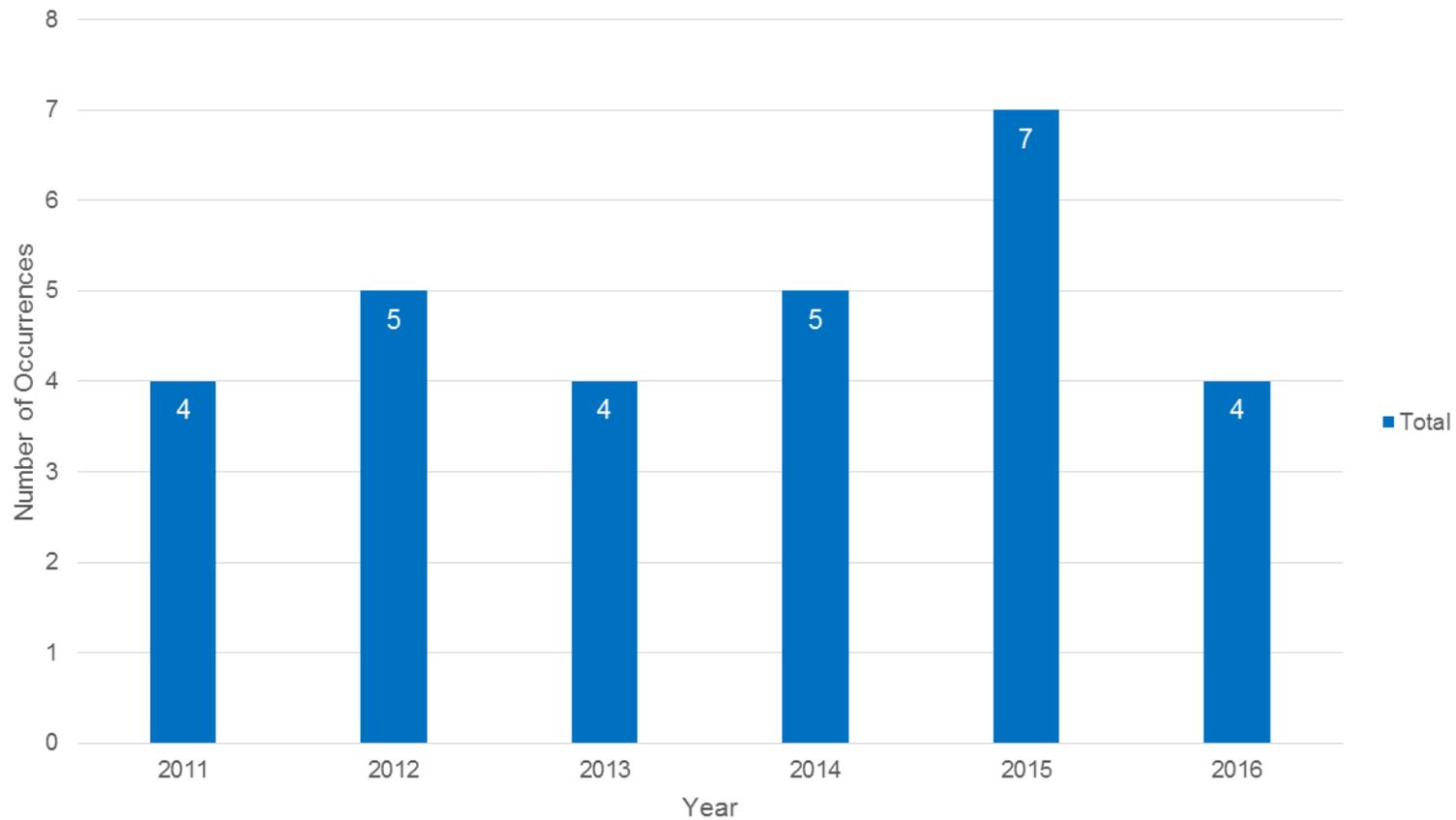
- **Controlled flight into or towards terrain/obstacles – 2 occurrences**
 - Loss of terrain or obstacle separation during precision or visual approach
 - D-ISJP – Warton - Serious Incident: Attempted landing at wrong airfield. [AAIB field investigation](#) identified, among other items: *lack of standard radio telephony discipline can contribute to developing a misunderstanding.*

Corporate Jets

Accidents, Serious Incidents and High Severity Occurrences



Accidents, Serious Incidents and High Severity Occurrences
Involving Corporate Jets
within UK Airspace or involving UK-registered aircraft



Corporate Jets

Occurrence analysis 2011 to 2015

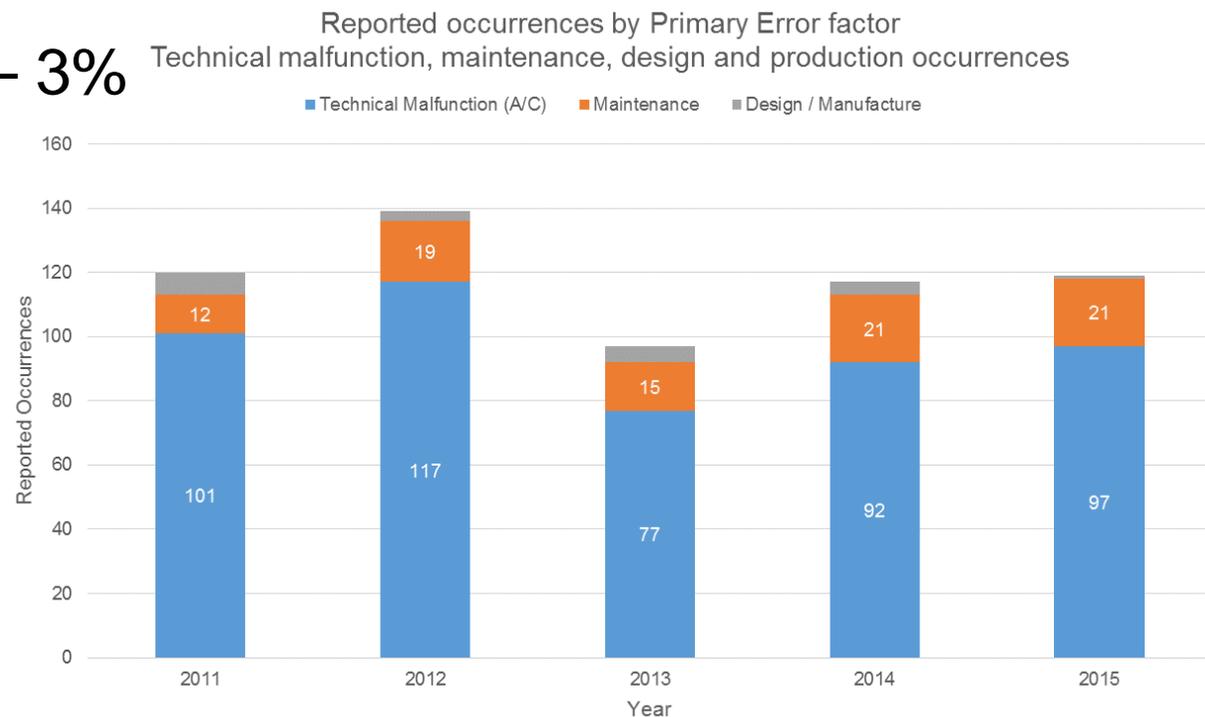
Precursors					Outcome/ Potential Outcome	
Aircraft upset from technical error or malfunction (4)	Aircraft upset from flight crew partial or total incapacitation (2)	Aircraft upset due to preceding aircraft (e.g. wake turbulence) (1)	Aircraft upset from flight crew error (automation/ manual flying) (1)	Other, unknown or undetermined (1)	Loss of control in-flight (9)	
Aircraft upset from flight crew error (automation/ manual flying) (3)	Aircraft upset from technical error or malfunction (2)	Aircraft upset due to environment/wildlife (1)	Aircraft upset due to lack of take-off performance (unknown/undetermined) (1)	Loss of situation awareness on ground – incorrect aircraft positioning on runway for departure (1)	Loss of Control on ground resulting in runway excursion (8)	
Incorrect or inadequate procedures and instructions (aerodrome/ground services) (2)	Incorrect or inadequate procedures and instructions (aircraft operator) (1)				Ground Collision related events (3)	
Close proximity in class G airspace (3)					Mid-air collision (3)	
Loss of terrain or obstacle separation during precision approach (1)	Loss of situational awareness – wrong aerodrome and/or runway selected during visual approach (1)				Controlled flight into or towards terrain/obstacles (2)	

Technical Occurrences

Occurrence analysis 2011 to 2015



- 592 Reported Occurrences – considers reports illustrating occurrences primarily attributable to:
- Technical Malfunction (A/C) - 82%
- Maintenance - 15%
- Design/Production – 3%

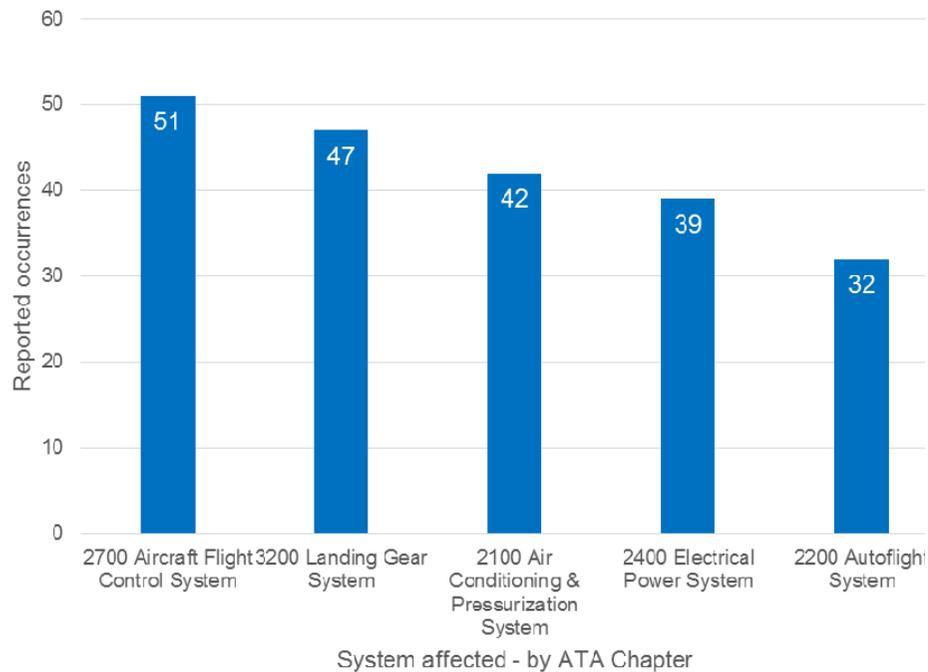


Technical Occurrences

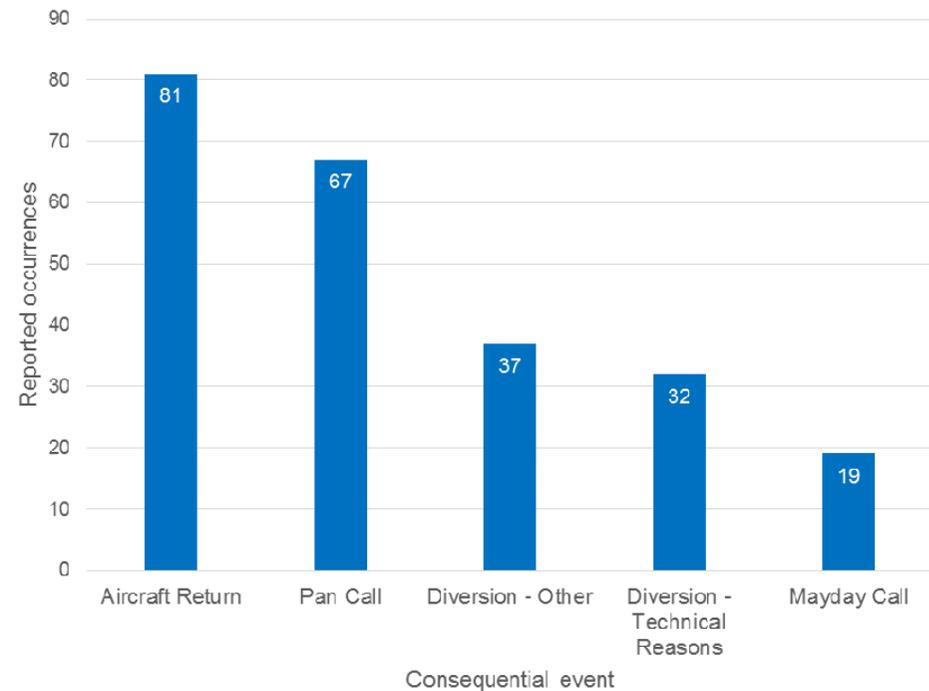
Occurrence analysis 2011 to 2015



Technical Malfunction (A/C)
Top-5 Aircraft Systems affected
(by ATA chapter)



Technical Malfunction (A/C)
Consequential event - Top-5

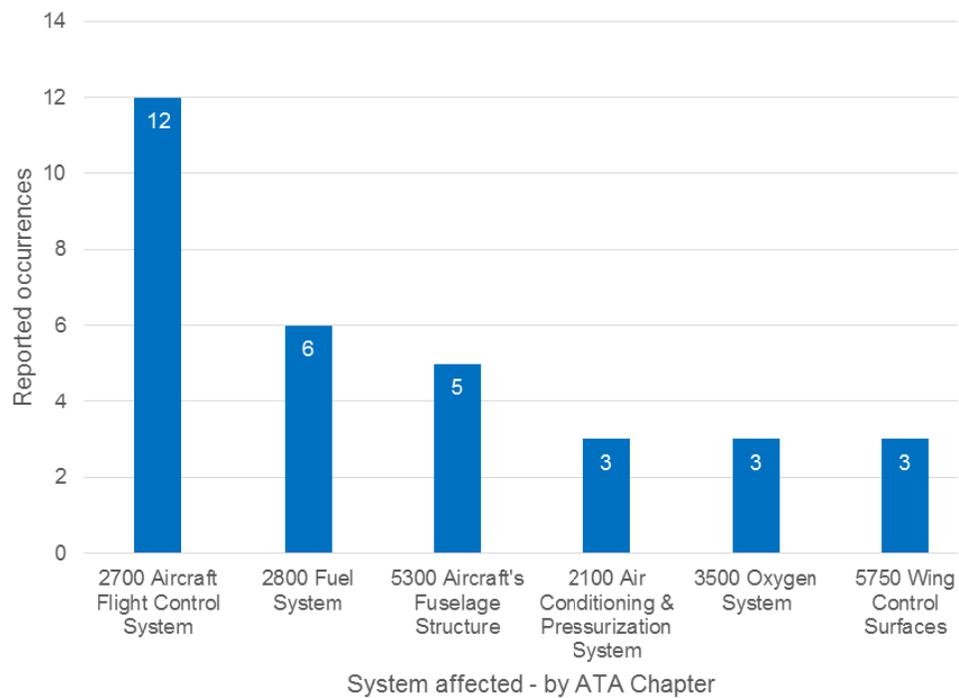


Technical Occurrences

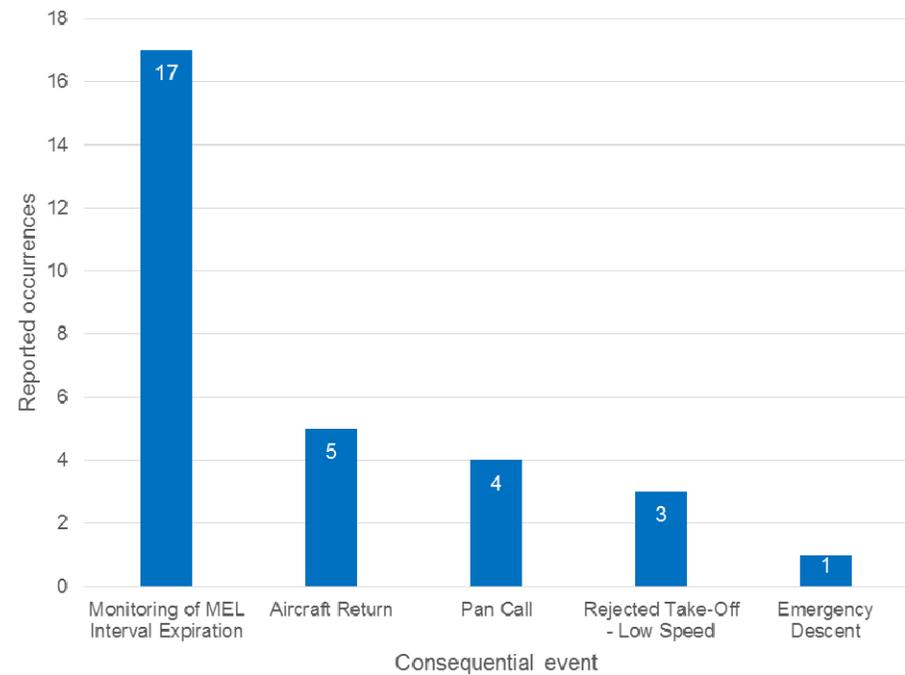
Occurrence analysis 2011 to 2015



Maintenance
Top-5 Aircraft Systems affected
(by ATA chapter)



Maintenance
Consequential event - Top-5



Appendix



- **High Severity definition:**

- The two most severe grades attributable to Mandatory Occurrence Reports (MORs) by the CAA Safety Data team

- **Accident definition (ICAO Annex 13):**

- An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:
 - **a) a person is fatally or seriously injured as a result of:**
 - being in the aircraft, or
 - direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
 - direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
 - **b) the aircraft sustains damage or structural failure which:**
 - adversely affects the structural strength, performance or flight characteristics of the aircraft, and
 - would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windcreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or
 - **c) the aircraft is missing or is completely inaccessible.**

- **Serious incident definition ICAO Annex 13):**

- An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

- Note 1 — The difference between an accident and a serious incident lies only in the result.

Thank you



- Questions?
- Please contact safety.intelligence@caa.co.uk for additional information