National Transportation Safety Board

Loss-of-Control and General Aviation Accident Statistics

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Member, NTSB

National Training Aircraft Conference

Embry-Riddle

Daytona Beach, FL August 13, 2018

NTSB Mission

The National Transportation Safety Board (NTSB) is an independent Federal agency created by the U.S. Congress to investigate every civil aviation accident in the United States and significant accidents in the other modes of transportation, namely – marine, highway, railroad and pipeline.

What We Do

- Investigate the accident.
- Determine the probable cause of the accident.
- Propose corrective action to reduce the likelihood of a recurrence of the accident - through formal “recommendations”.

Investigative Process for Major Investigations

- Decision to launch a “Go-Team”
- IIC and other staff designated
- Arrival On-Scene
- Organizational Meeting
- Briefings and on-scene activities (i.e. fact gathering)
- Post on-scene fact gathering
- Analysis
- Report preparation – findings, PC, recommendation development
- Board Approval
- Advocacy

“Sully” Depiction of NTSB?

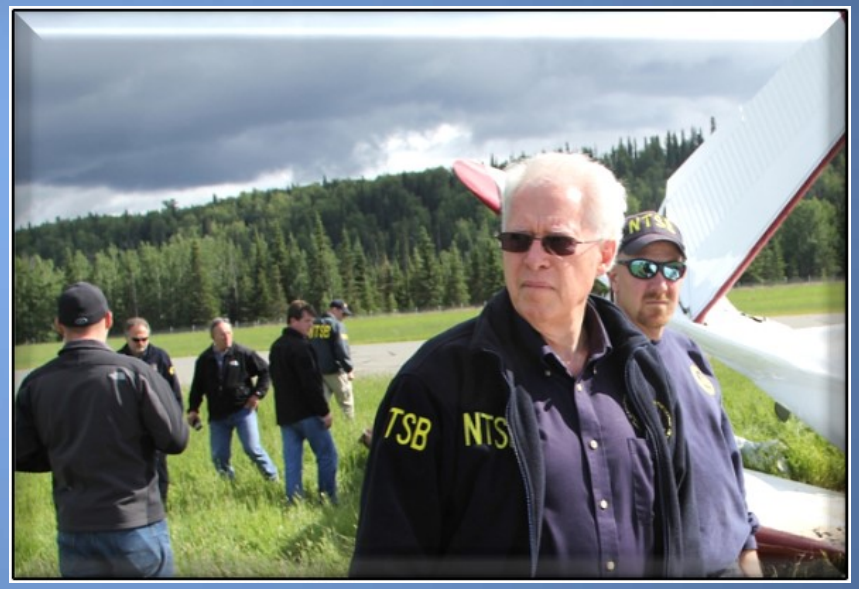
- Facts regarding accident accurately portrayed
- Depiction of investigation process not accurate
  - Movie needed a villain – but not the birds
  - NTSB’s objective is to determine cause, not blame
  - Investigations rely heavily upon cooperation by all of the “parties,” hence NTSB is not confrontational
  - Movie’s negative portrayal of investigation process may chill cooperation

NTSB Investigative Hearing

- Three-day public hearing June 9-11, 2009
  - **Board of Inquiry** Chaired by Member Robert Sumwalt
- Investigative Hearing
  - Fact-finding only
  - No conclusions
  - No assignment of fault or blame
  - No enforcement responsibilities
- Video of Hearing available on YouTube

NTSB's Multi-Modal Mandate

- Maintain congressionally mandated independence
- Conduct objective accident investigations and safety studies
- Perform fair & objective airman/mariner certification appeals
- Advocate safety – NTSB Most Wanted List, recommendations



NTSB 2017/2018 Most Wanted List

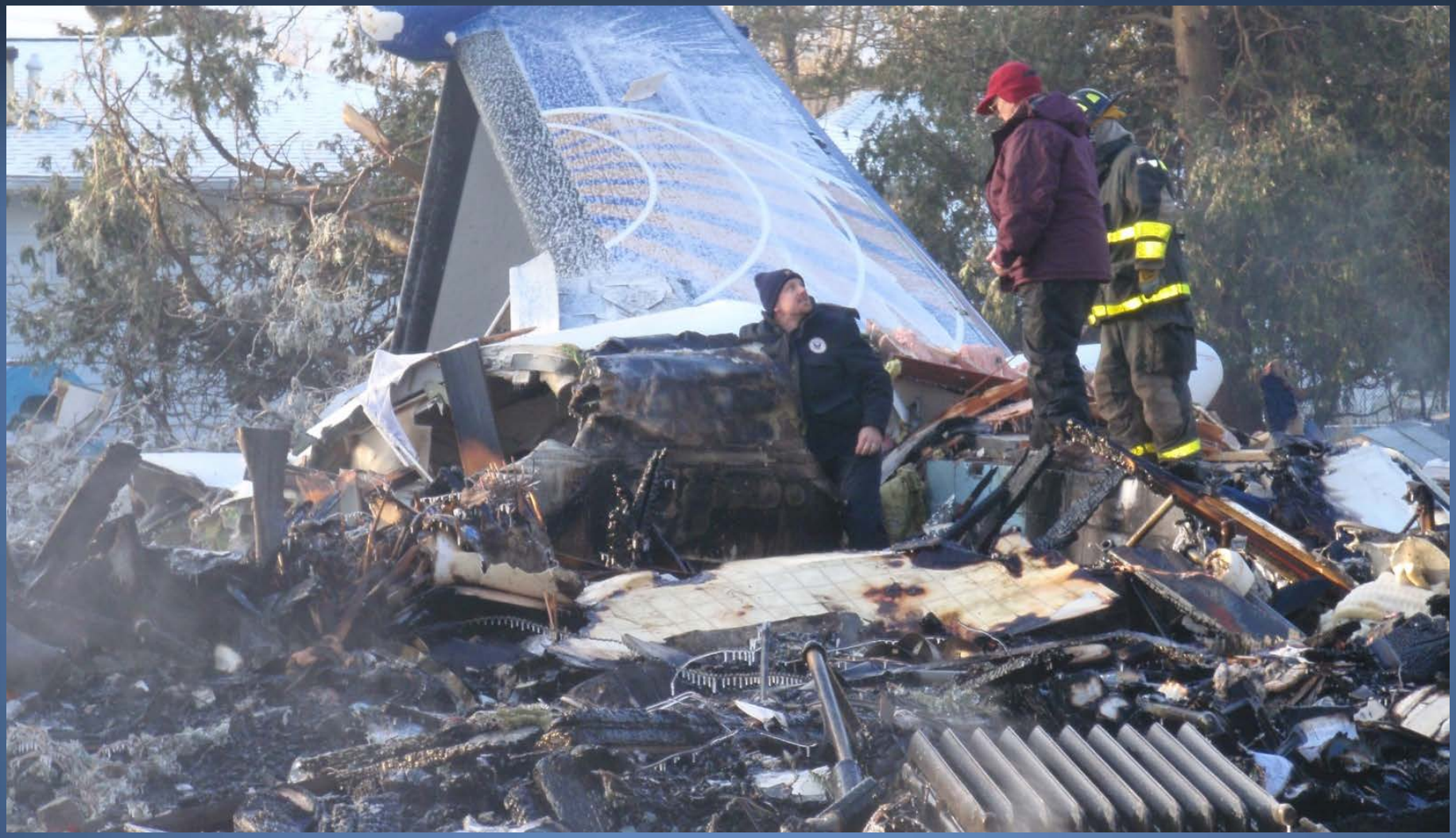
Backed by recommendations!

- Eliminate Distractions
- End Alcohol and Other Drug Impairment in Transportation
- Ensure the Safe Shipment of Hazardous Materials
- Expand Recorder Use to Enhance Safety
- Improve Rail Transit Safety Oversight
- Increase Implementation of Collision Avoidance Technologies
- Prevent Loss of Control in Flight in General Aviation
- Reduce Fatigue-Related Accidents
- Require Medical Fitness
- Strengthen Occupant Protection

2017/2018 MWL – Prevent Loss of Control in GA Flight

NTSB

Loss of Control



Execuflight Flight 1526
British Aerospace HS /
Akron, Ohio / Nov. 10, 2015

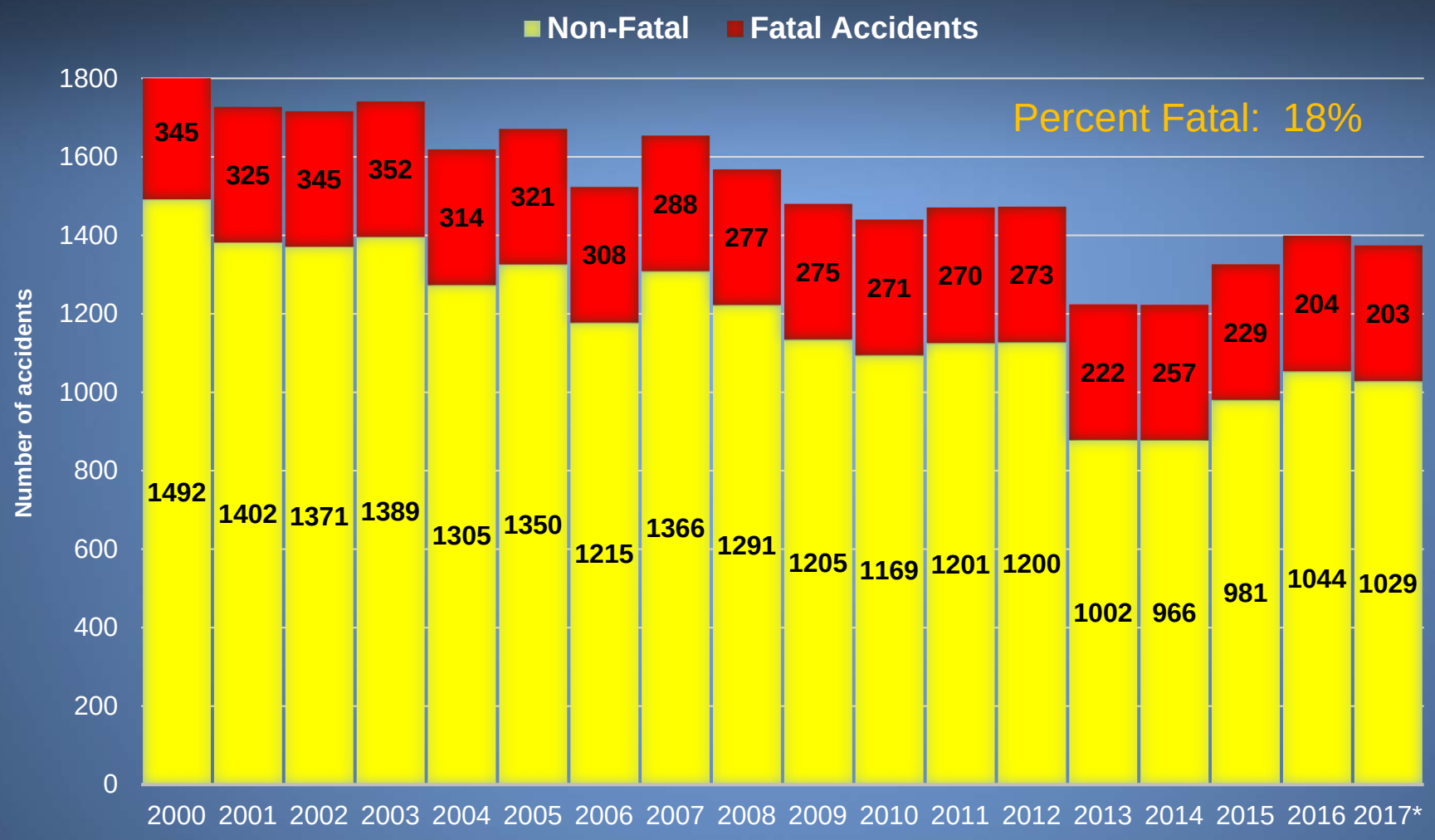
Beech A36 / Huggins, MO
/ June 12, 2015

2017/2018 MWL – Prevent Loss of Control in GA Flight

- On average, more than 40% fatal GA accidents were LOC during 2004 – 2016

- Most deadly flight phases
  - Approach to landing
  - Maneuvering
  - Climb

All GA Accidents



* 2017 Preliminary numbers

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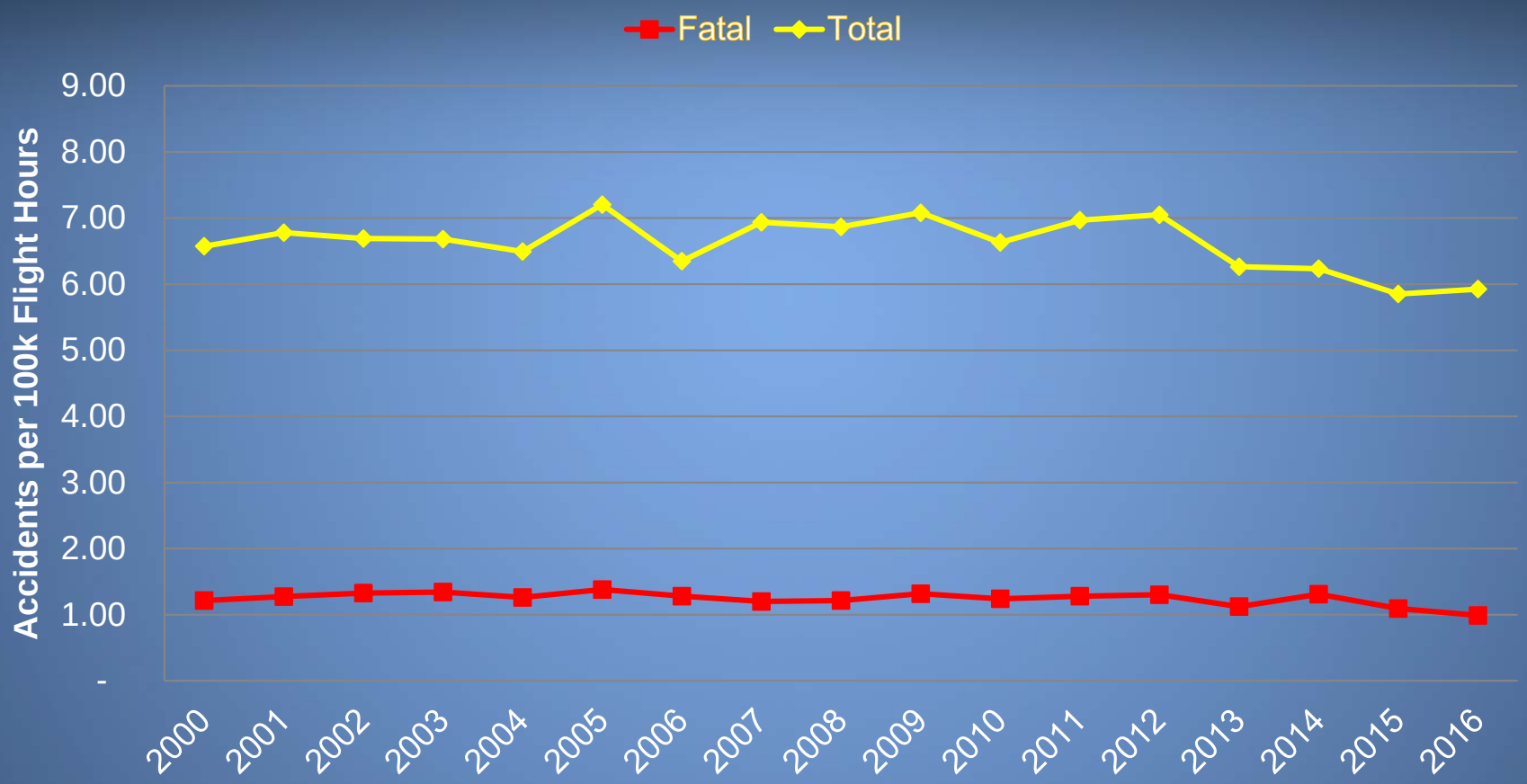
GA Accident Rates



*The 2011 GA Survey is currently not available. FAA is actively engaged in re-calibration efforts and expect to have validated 2011 data published at a later date.

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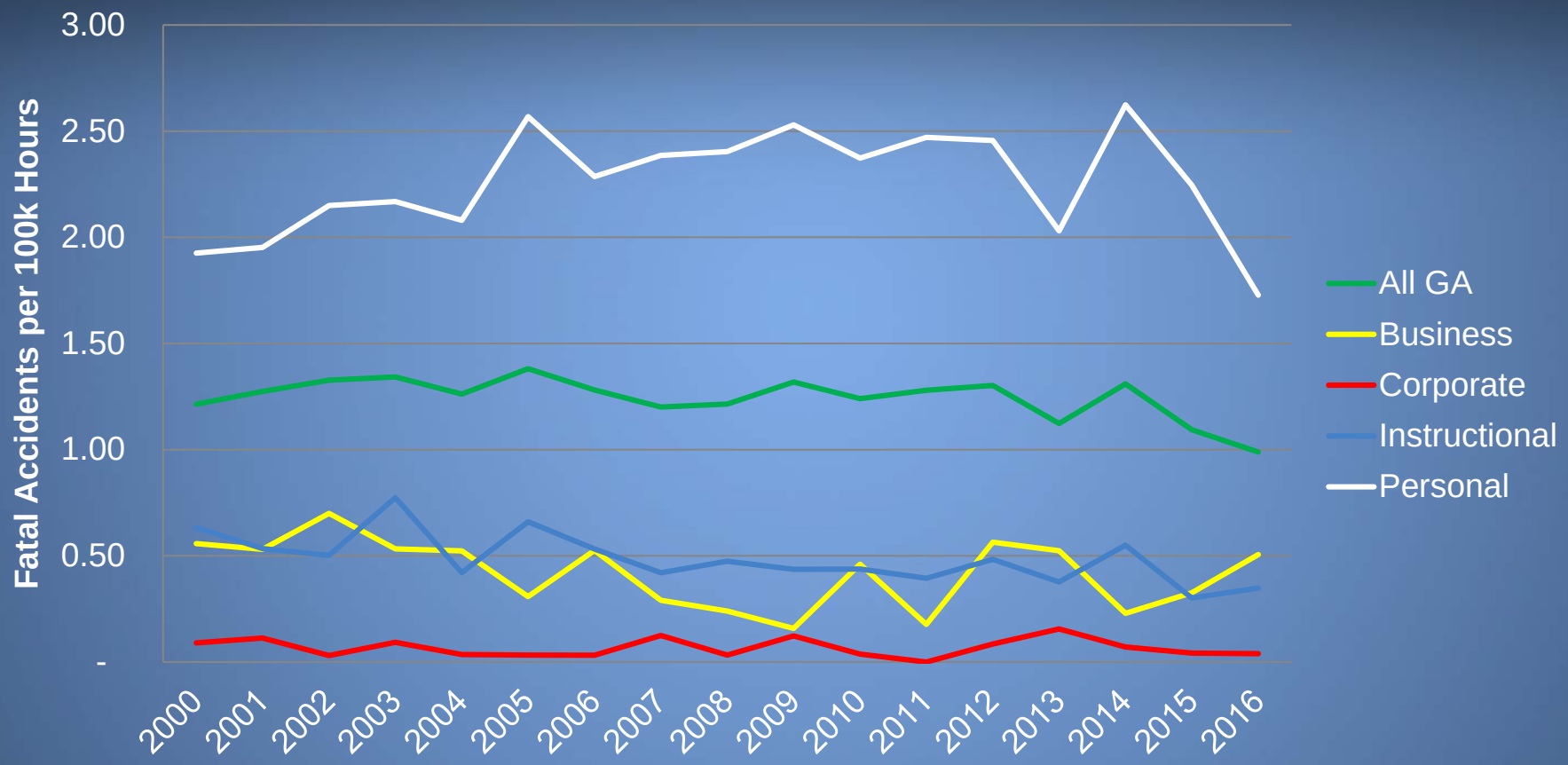
Fatal Accident Rates per 100k Flight Hours



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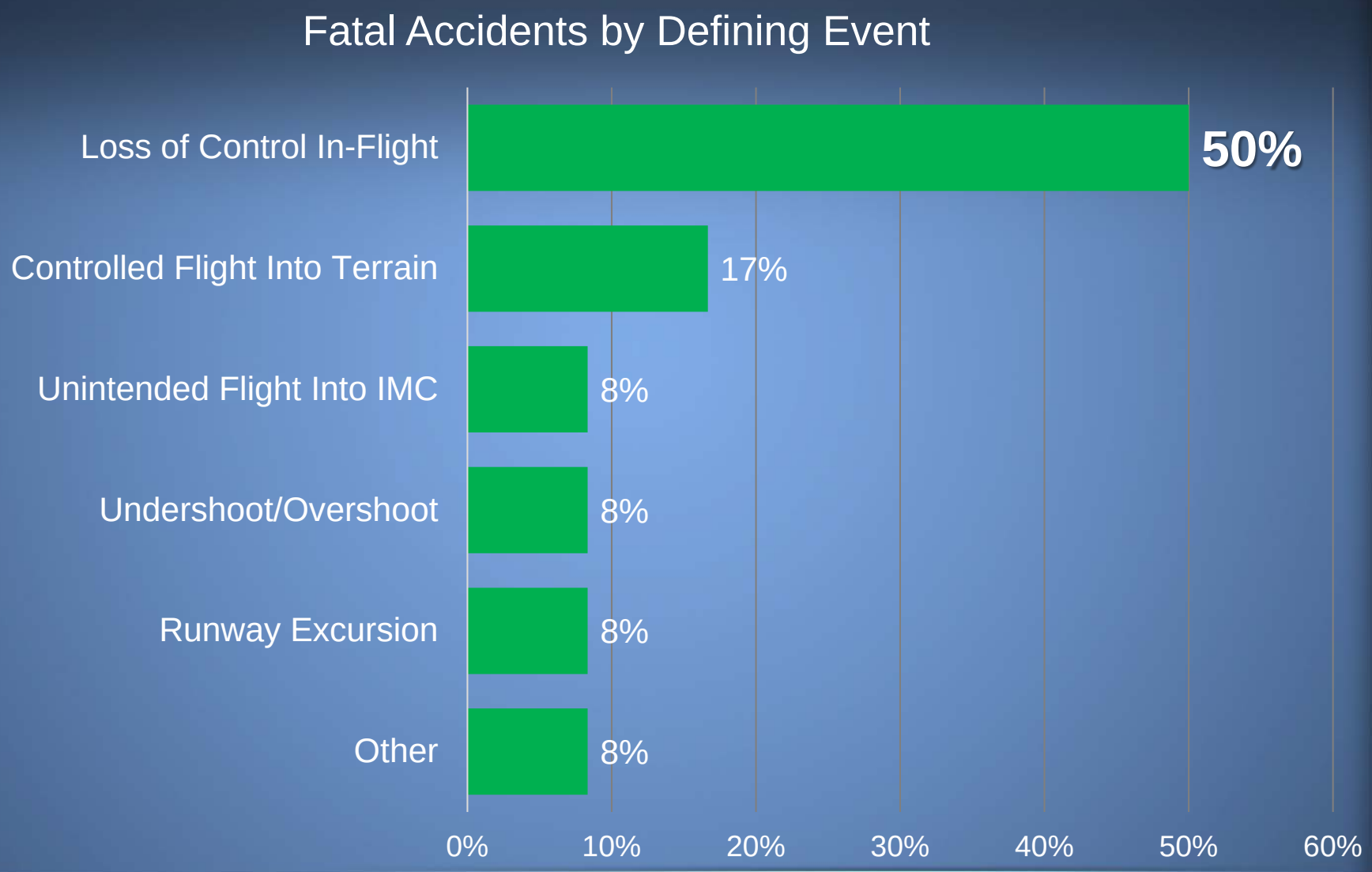
Corporate Flying, 2008-2017



Excludes cases without event data

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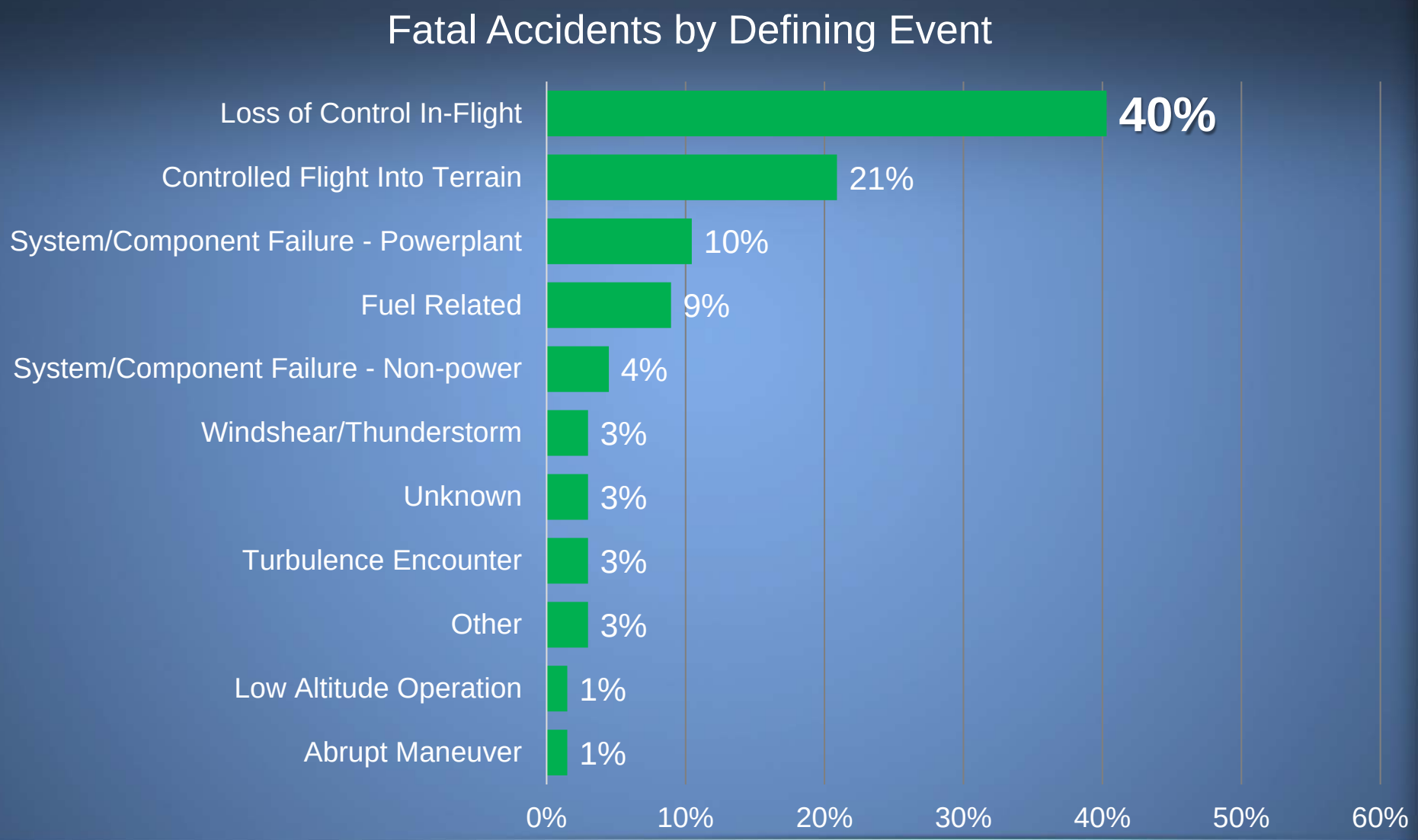
Business Flying, 2008-2017



Excludes cases without event data

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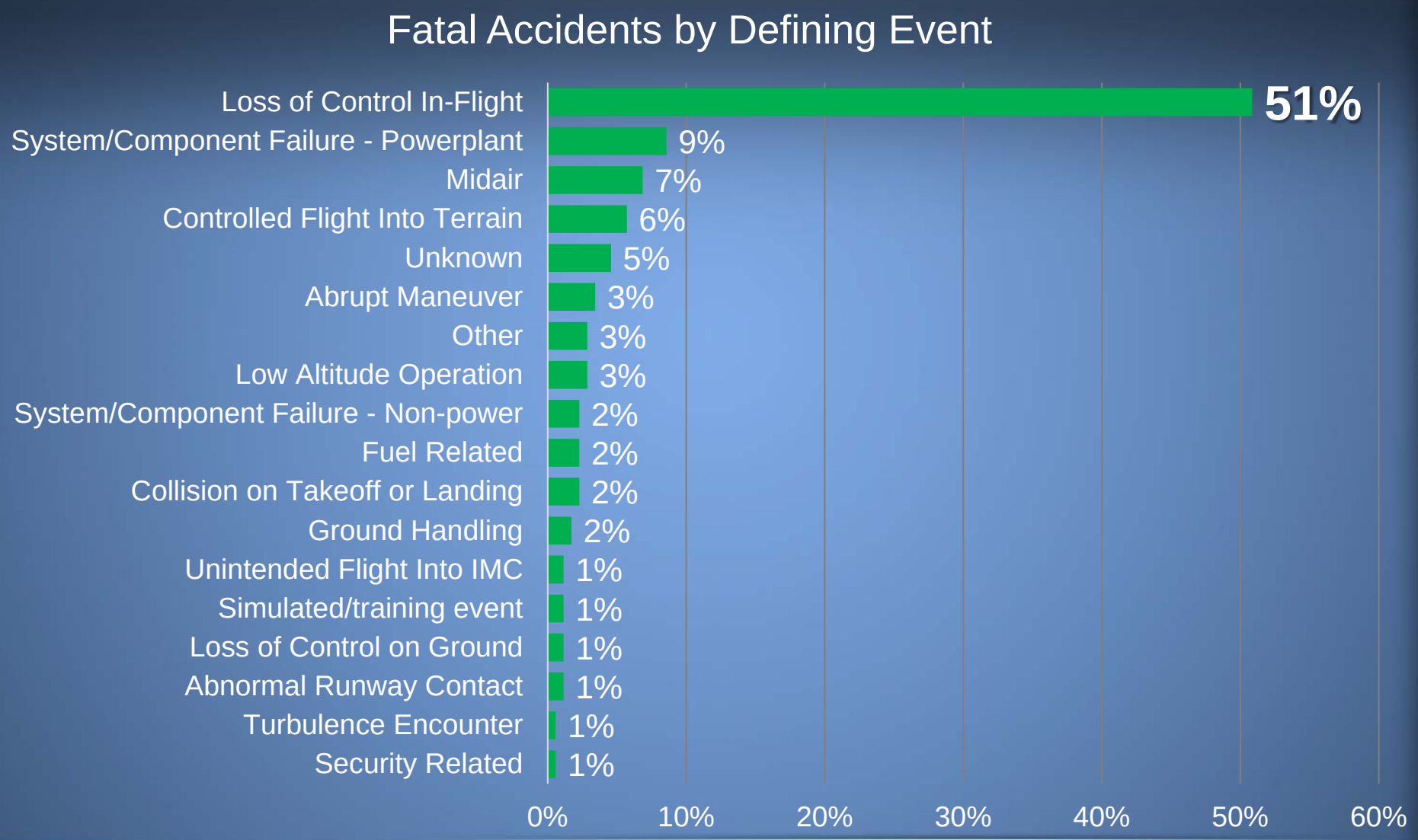
Instructional Flying, 2008-2017



Excludes cases without event data

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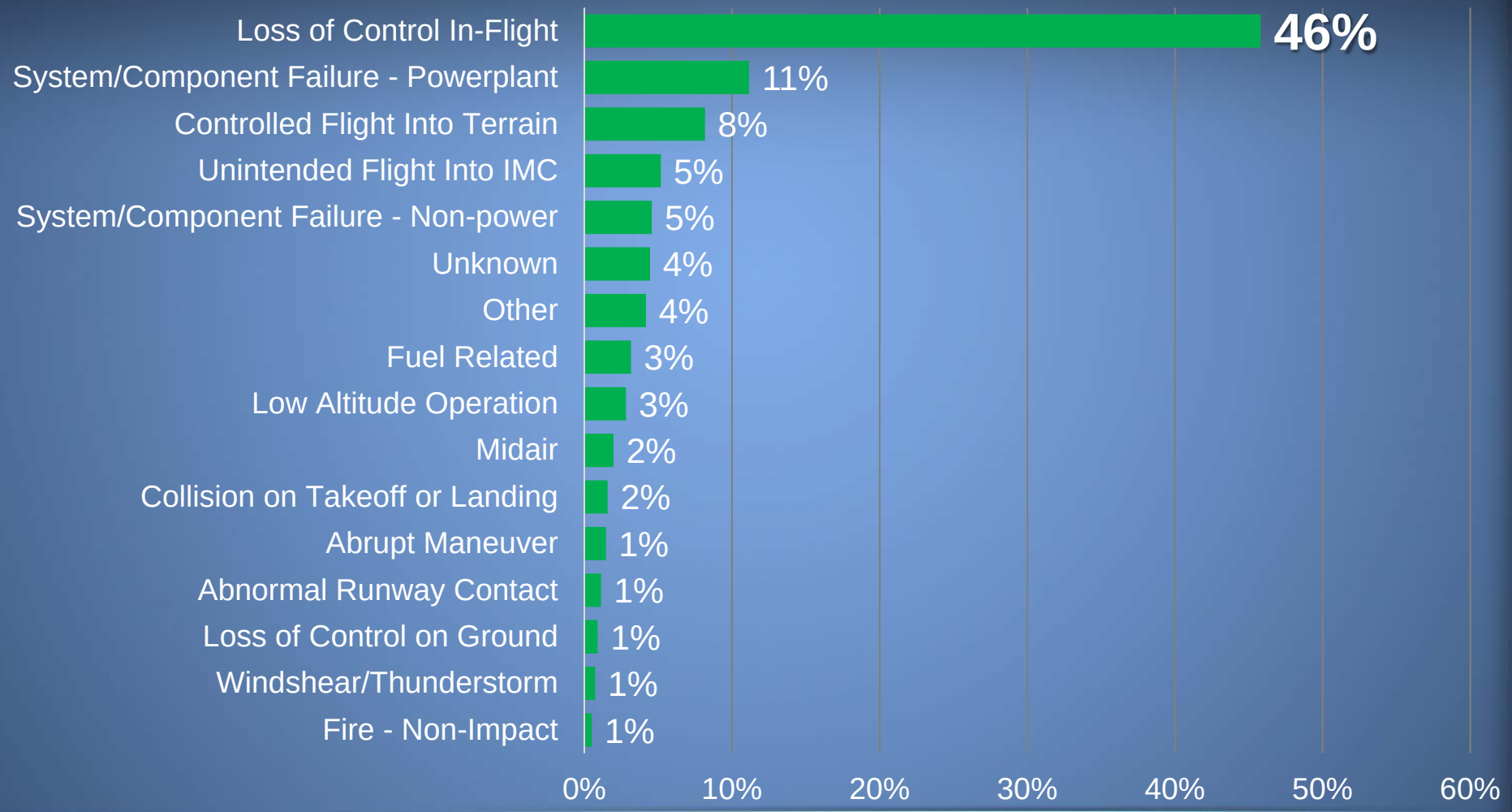
Personal Flying, 2008-2017

Fatal Accidents by Defining Event



Excludes cases without event data

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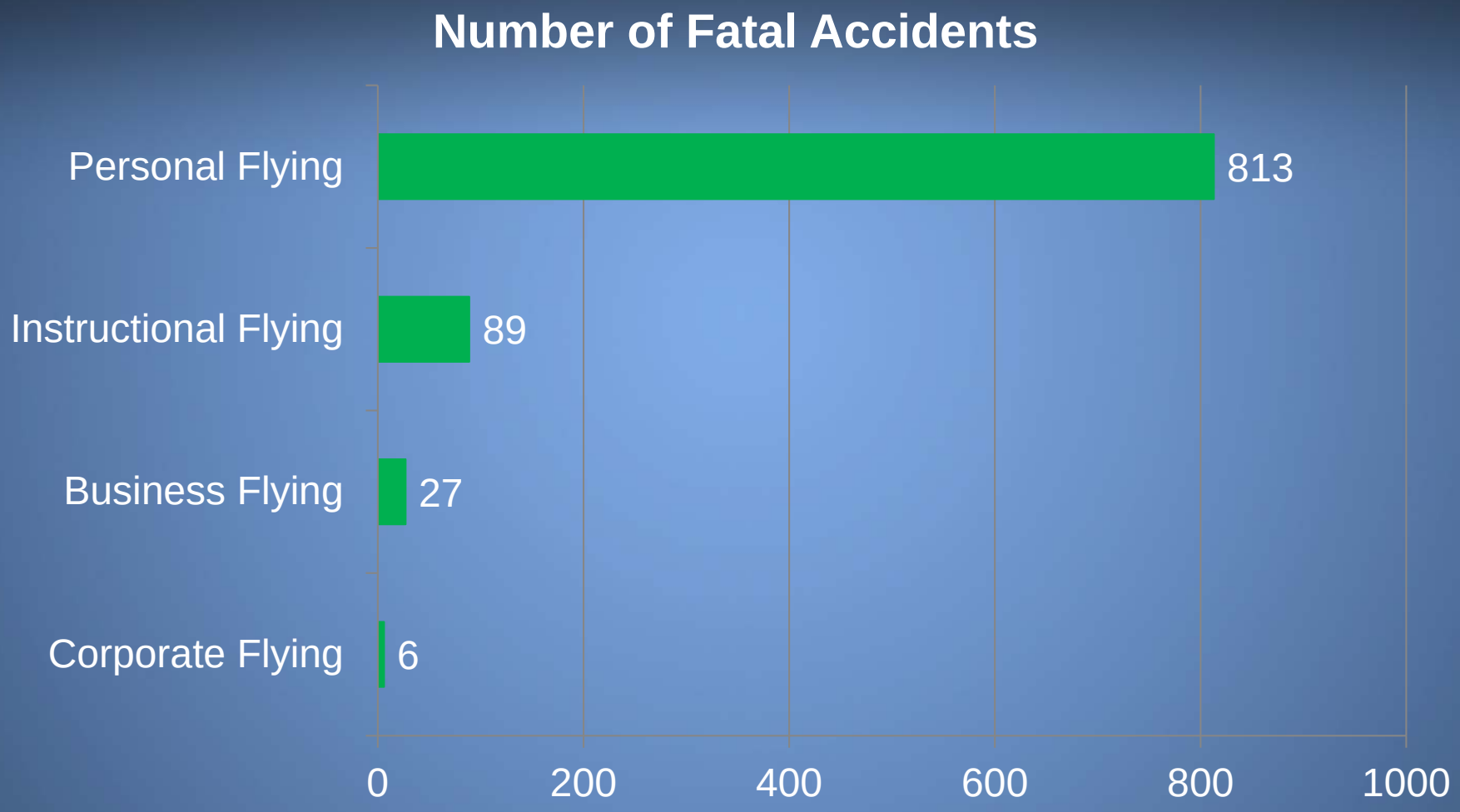
Loss of Control In-Flight, 2008-2017



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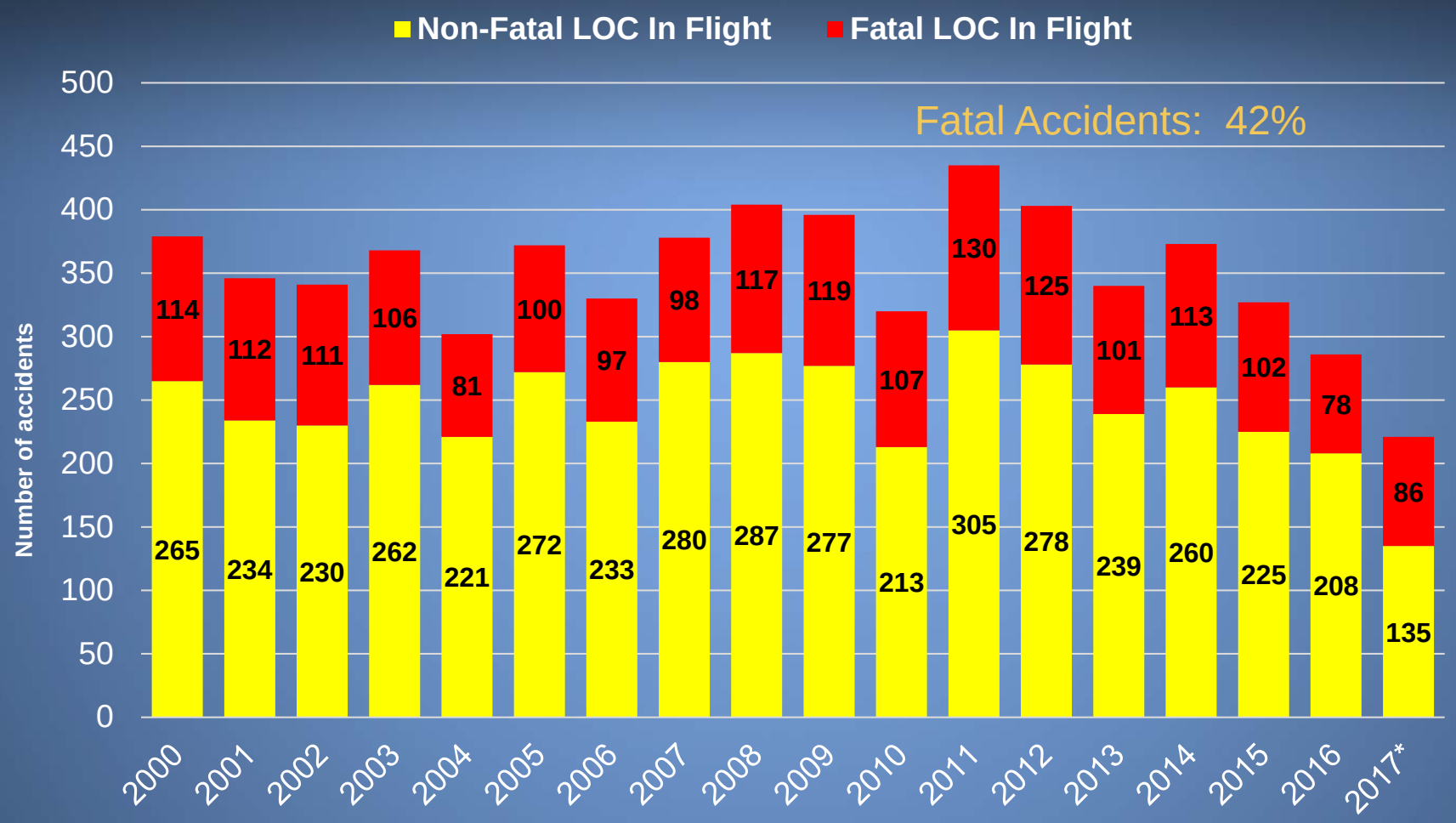
GA LOC Accidents



* 2017 Preliminary numbers

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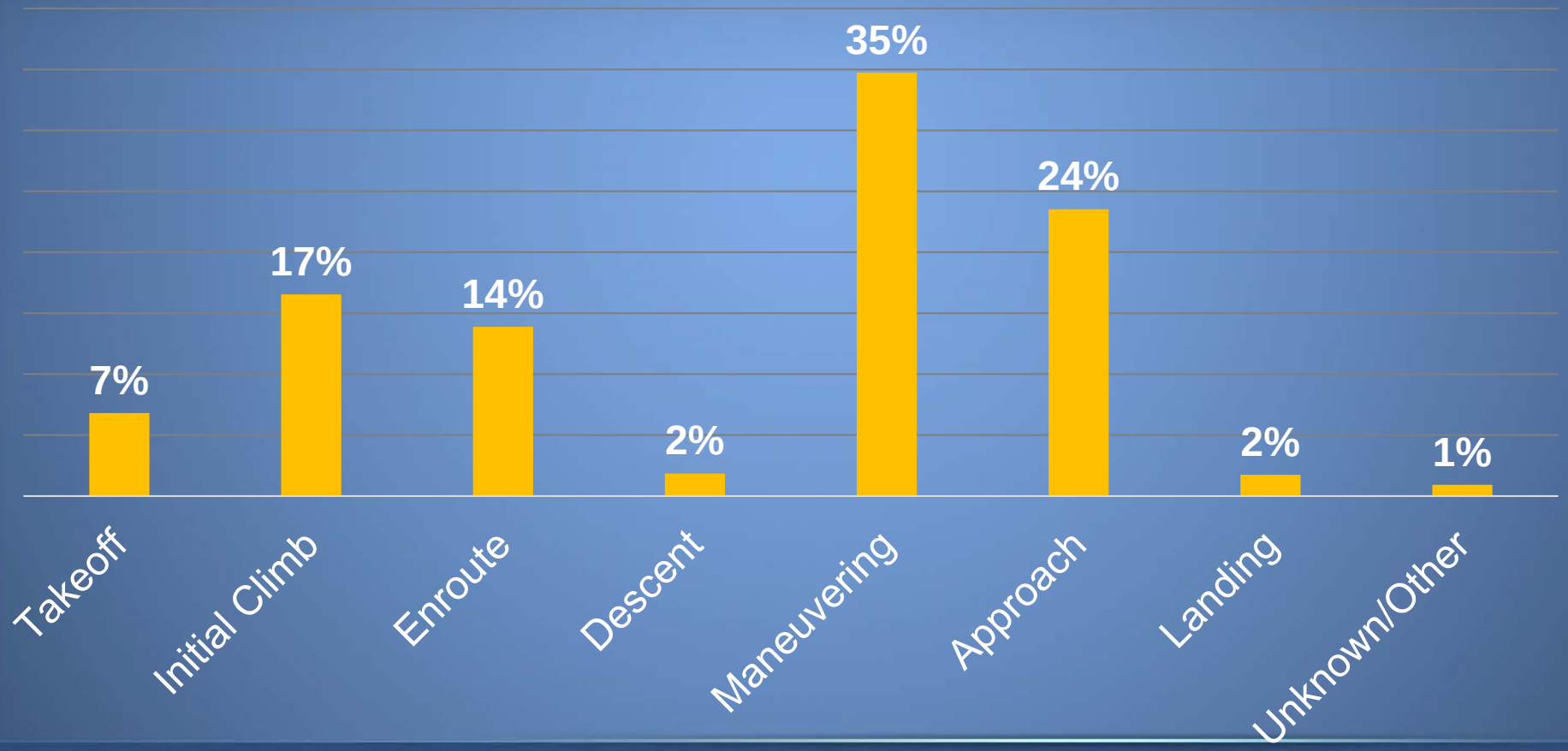
GA LOC: Where It Happens

Fatal GA Loss of Control Accidents by Broad Phase of Flight, 2008-2017



Excludes cases without event data

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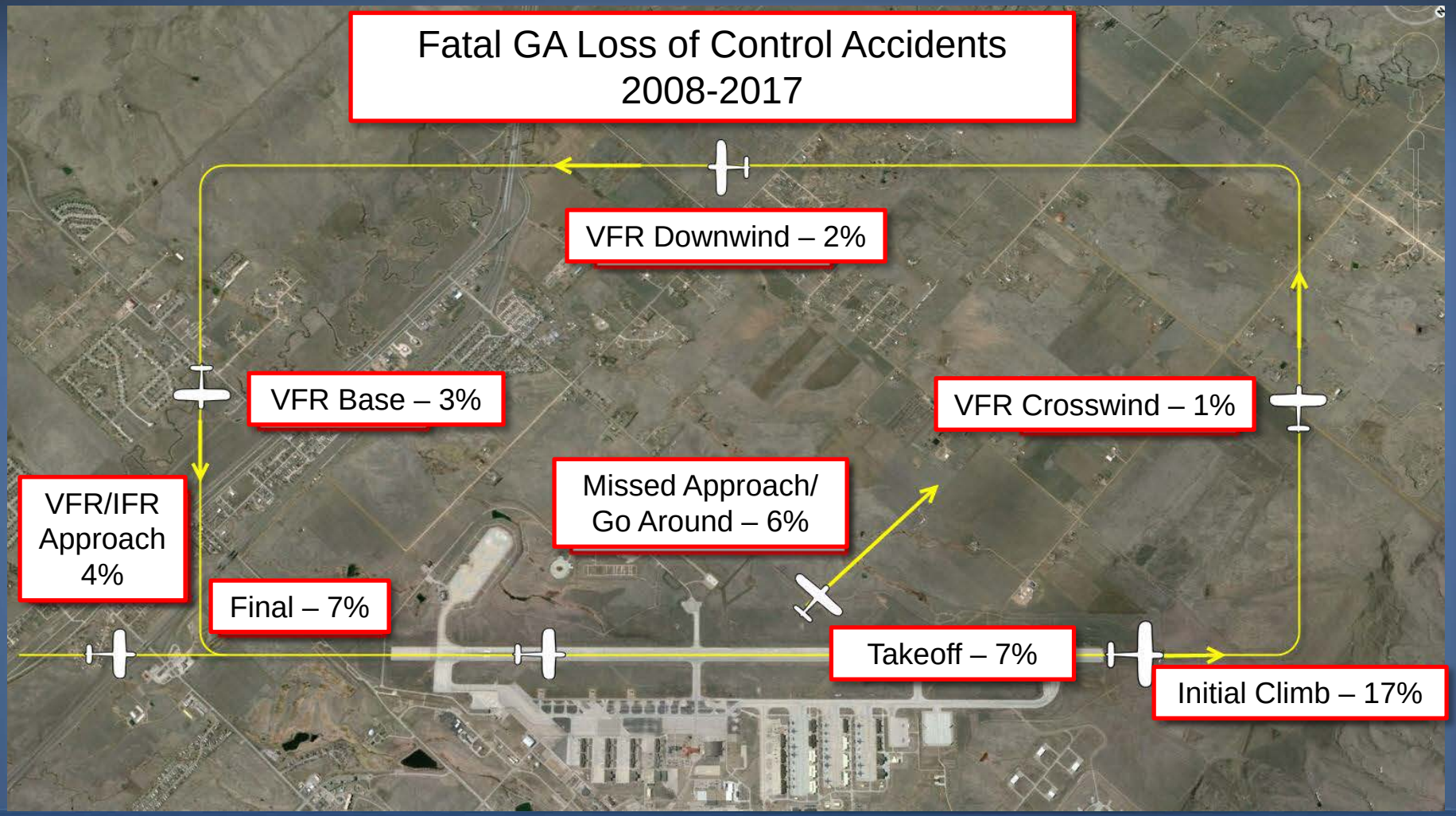
Airport-Related GA LOC



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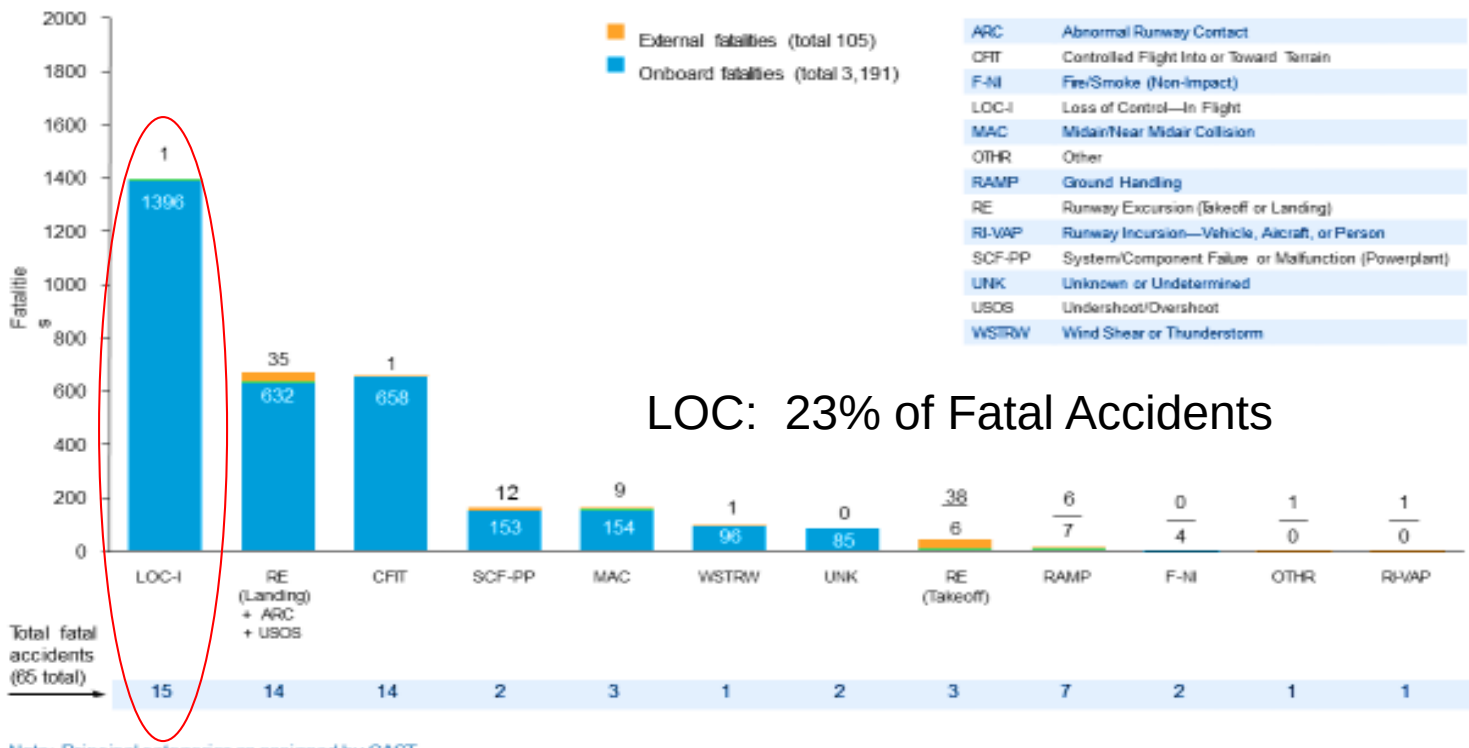
Worldwide Commercial Jets

Fatalities by CICTT Aviation Occurrence Categories

Fatal Accidents | Worldwide Commercial Jet Fleet | 2006 through 2015



ARC	Abnormal Runway Contact
CFIT	Controlled Flight Into or Toward Terrain
F-NI	Fire/Smoke (Non-Impact)
LOC-I	Loss of Control—In Flight
MAC	Midair/Near Midair Collision
OTHR	Other
RAMP	Ground Handling
RE	Runway Excursion (Takeoff or Landing)
RI-VAP	Runway Incursion—Vehicle, Aircraft, or Person
SCF-PP	System/Component Failure or Malfunction (Powerplant)
UNK	Unknown or Undetermined
USOS	Undershoot/Overshoot
WSTRW	Wind Shear or Thunderstorm

LOC: 23% of Fatal Accidents

Note: Principal categories as assigned by CAST.

For a complete description of CAST/ICAO Common Taxonomy Team (CICTT) Aviation Occurrence Categories, go to www.intlaviationstandards.org.

22 | 2015 STATISTICAL SUMMARY, JULY 2016

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NTSB

GAJSC
Who We Are…

Steering Committee

Co-chairs – Mike O'Donnell (FAA/AVP)
Sean Elliott (EAA)

Government – FAA (AFS, AIR, ATO, AAM & ARP)
– NASA (Research),
– NTSB (Observer)

Industry – GAMA, EAA, NBAA, NATA, SAFE, LAMA & Insurance

- Strategic guidance
- Management/Approval of Safety Plan
- Provide direction
- Membership Outreach
- Provides linkage to ASIAS

Safety Analysis Team

Co-chairs: Corey Stephens (FAA)
Jens Hennig (GAMA)

Members: FAA, AOPA, EAA, GAMA, UAA, MFGs, FAAST, NAFI, Insurance, Academia, SAFE

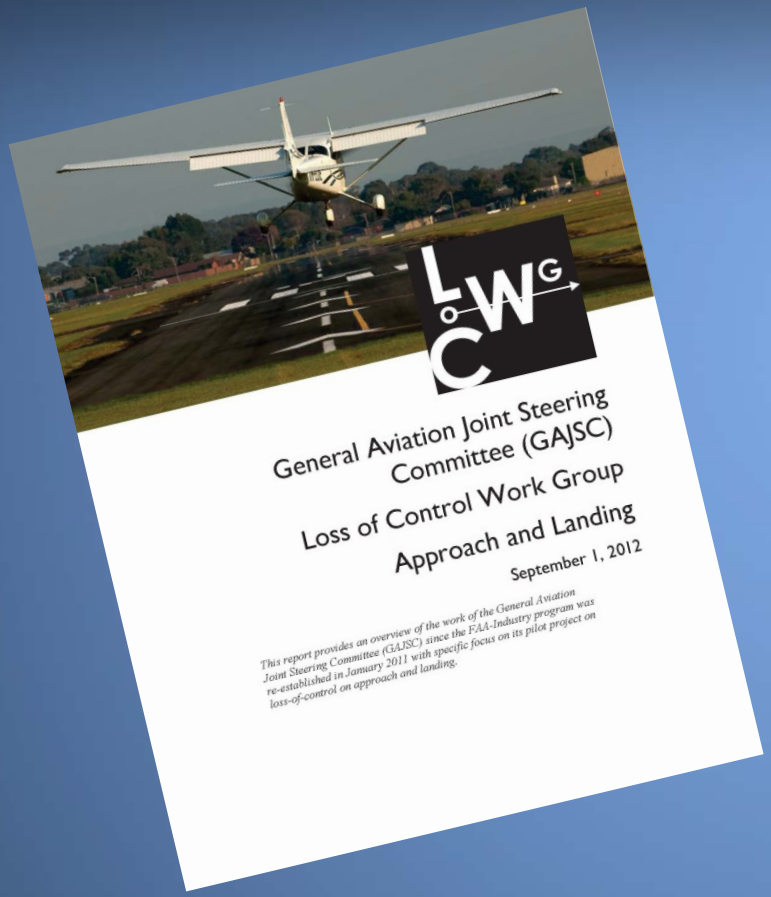
- Identify future areas of study/risk
- Charter safety studies
- Provide guidance and direction
- Draw data from various areas
- Develop a prioritized Safety Plan
- Develop metrics to measure effectiveness of safety solutions

Working Groups

(To include SMEs from various general aviation segments, depending on study)

- Data analyses
- Safety enhancement
- Mitigation development

Loss-Of-Control Working Group



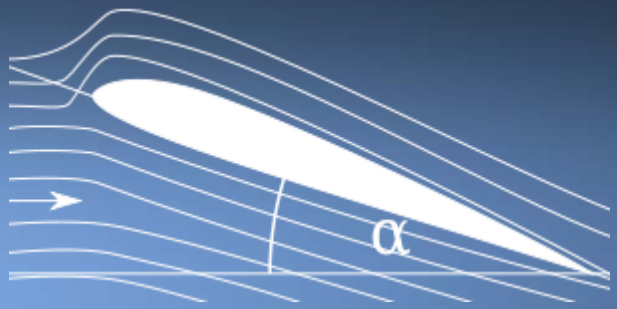
Safety Enhancements Identified

- AOA – New, Current, Retrofit
- Aeronautical Decision Making
- Stabilized Approach
- Single Pilot CRM
- Medication effects
- Weather Technologies
- Etc…

28 Safety Enhancements
plus
8 more with second study

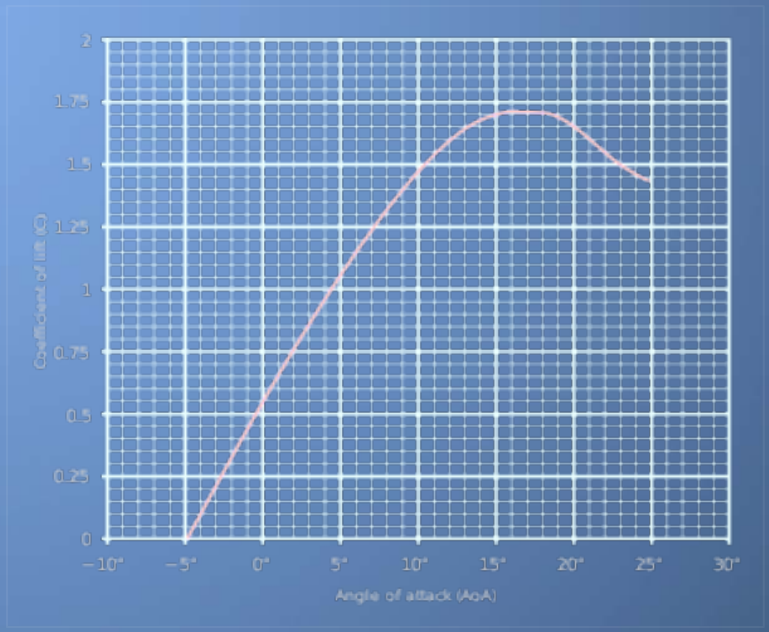
Lower Cost AOA Displays

- Stall occurs at a specific Angle-of-Attack
  - But not necessarily at the same airspeed



First of AOA indicators built to ASTM stds and installed as a minor mod

FAA policy changed on Non-Required Safety Equipment



LOC Roundtable – What, When, Where

Roundtable Agenda

Tuesday, April 24, 2018

0830–0845 . . . . **WELCOME/OPENING** • Robert L. Sumwalt, *NTSB Chairman*

0845–0900 . . . . **INTRODUCTION:** ***Data & Accidents***
• John DeLisi, *Director, NTSB Office of Aviation Safety*

0900–1100 . . . . **TOPIC 1:** ***Pilot Training/Education***

1100–1200 . . . . **LUNCH** • *On your own (Promenade Level)*

1200–1215 . . . . **SPECIAL PRESENTATION:** ***Remora Systems, EAA Founder's Innovation Prize Winner***

1215–1400 . . . . **TOPIC 2:** ***Cockpit Technology***

1400–1415 . . . . **BREAK**

1415–1450 . . . . **TOPIC 3:** ***Challenges & Next Steps***

1450–1500 . . . . **CLOSING** • Robert L. Sumwalt, *NTSB Chairman*

MODERATED BY NTSB CHAIRMAN
Robert L. Sumwalt

NTSB 50 Making Transportation Safer
YESTERDAY ★ TODAY ★ TOMORROW

Organizations At The Table

Industry & Government Roundtable Participants

Aircraft Owners & Pilots Association | Justin Barkowski, *Director of Gov't/Regulatory Affairs*
AOPA Air Safety Institute | Paul Deres, *Director of Education*
Experimental Aircraft Association | Sean Elliott, *Vice President of Advocacy & Safety*
Embry-Riddle Aeronautical University | Carolina Anderson, *Associate Professor of Aeronautics*
Federal Aviation Administration | Mel Johnson, *Policy & Innovation Division;* Brad Palmer, *General Aviation & Commercial Division;* Dave Sizoo, *Small Airplane Standards Staff;* Corey Stephens, *Accident Investigation & Prevention*
ForeFlight | Tyson Weihs, *Co-Founder and CEO*
General Aviation Manufacturers Association | Jens Hennig, *VP of Operations*
Liberty University School of Aeronautics | Andrew Walton, *Director of Safety*
Mindstar Aviation | Stasi Poulos, *President and CEO*
NTSB | *The Honorable* Earl Weener, *Board Member;* Timothy LeBaron, *Deputy Director for Regional Operations;* Mike Folkerts, *Air Safety Investigator*
Orbital ATK Flight Systems | Charlie Precourt, *VP & General Manager*
Patty Wagstaff Aviation Safety | Patty Wagstaff, *General Manager*
Society of Aviation & Flight Educators | Doug Stewart, *Founding & Charter Member*

Douglas Adams
Author

"Human beings,
who are almost unique
in having the ability to learn
from the experience of others,
are also remarkable
for their apparent disinclination to do so."

National Transportation Safety Board

Safety Management System

- Safety Policy
- Safety Risk Management
- Safety Assurance
- Safety Promotion

Changes to Safety Culture

Reactive & Forensic

- Whack-a-mole management
- Crisis safety management
- Silos of knowledge
- Data is collected

Risk-based & Predictive

- Risk management
- Change management
- Data analysis and information sharing
- Data answers questions

Changes to Safety Culture

Reactive & Forensic		Risk-based & Predictive
• "Off with their heads"	→	• Just culture
• Safety organization responsible for safety	→	• Everyone responsible for safety
• Regulator is dictatorial and despised	→	• Regulator is collaborative and respected
• Safety expected by regulations	→	• Safety enhanced via voluntary initiatives