National Transportation Safety Board

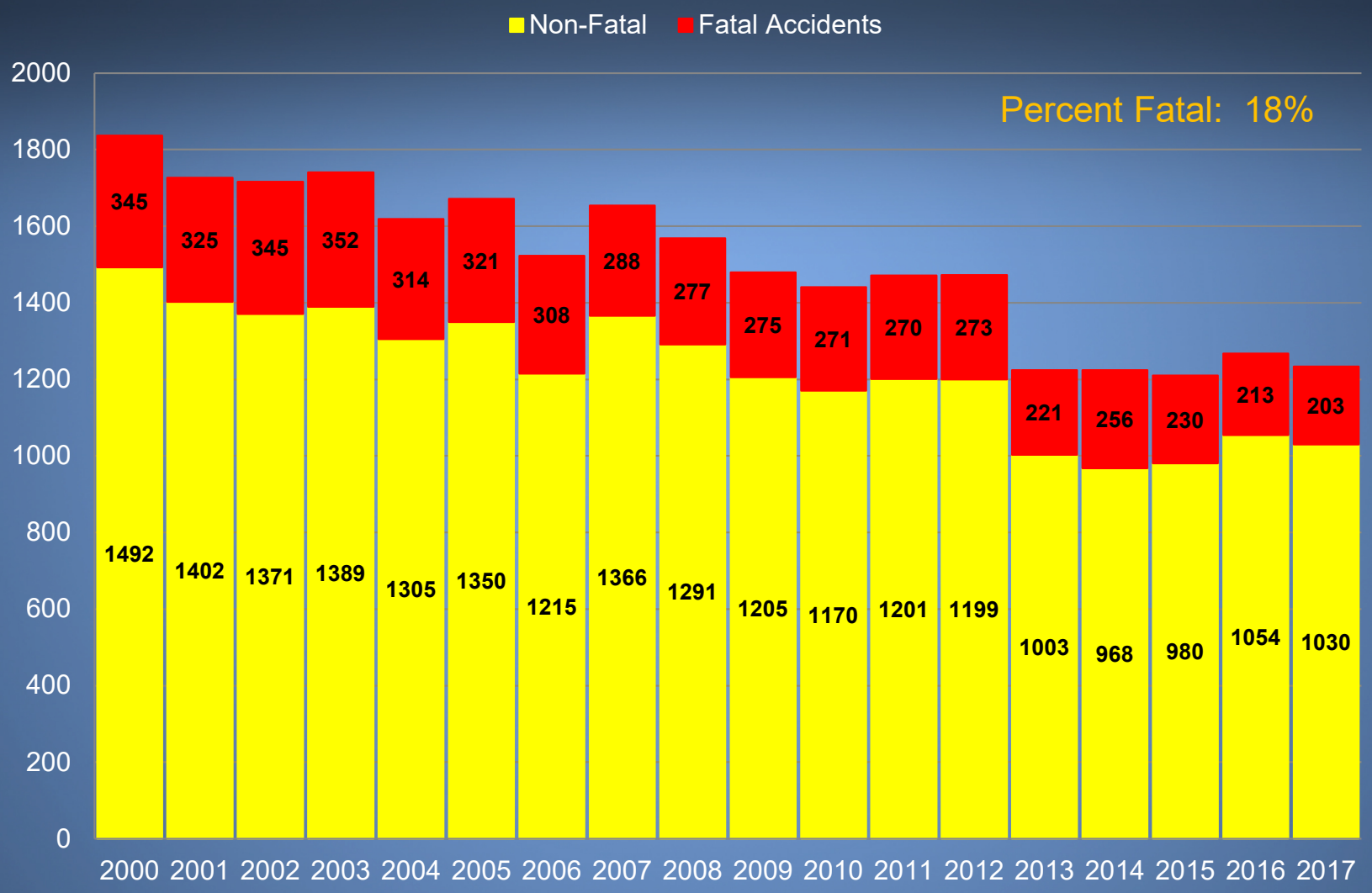
General Aviation Accident Statistics

Earl F. Weener, Ph.D.
Member, NTSB

NTSB Night Flying Seminar

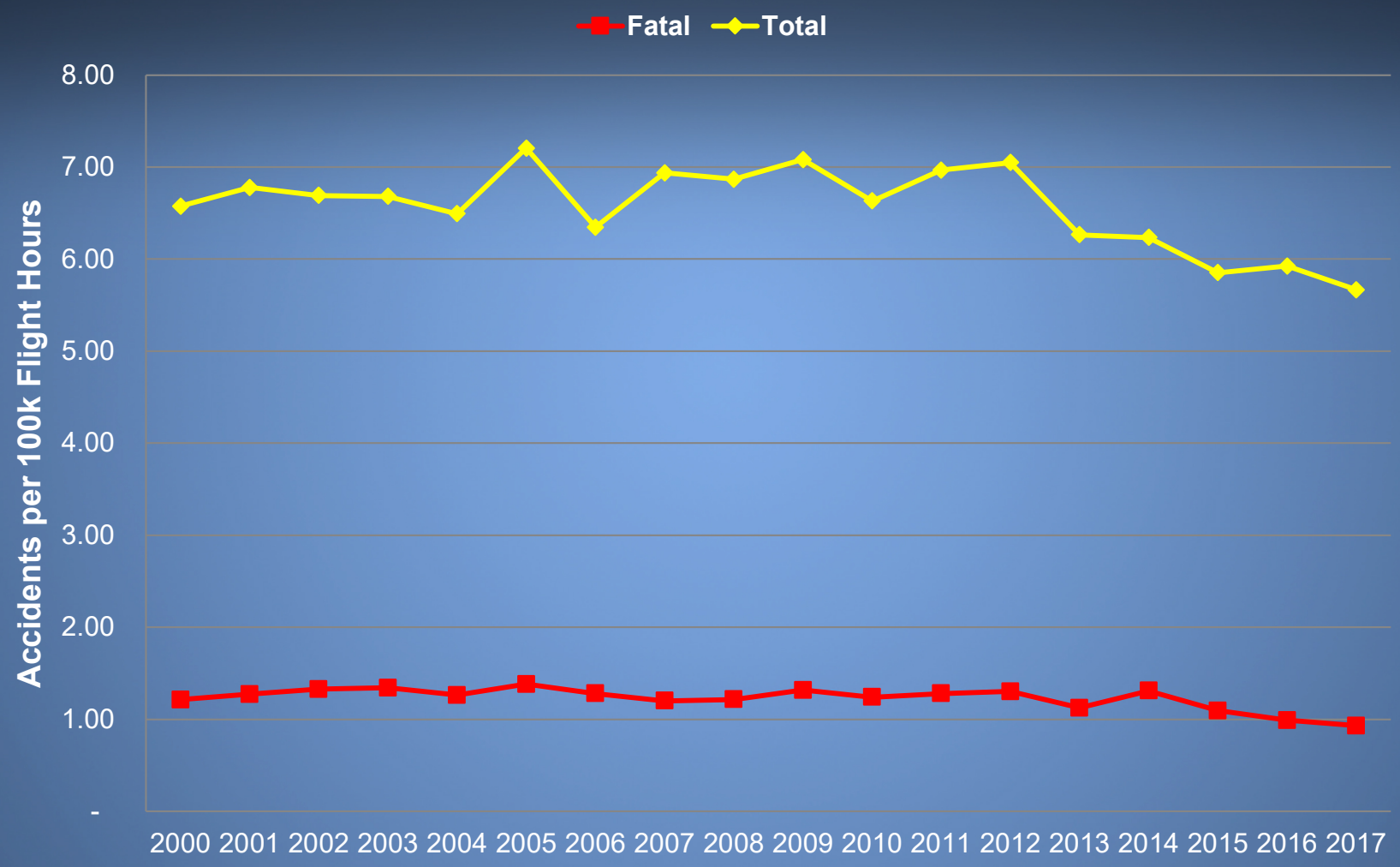
NTSB Training Center December 15, 2018

All GA Accidents



NTSB

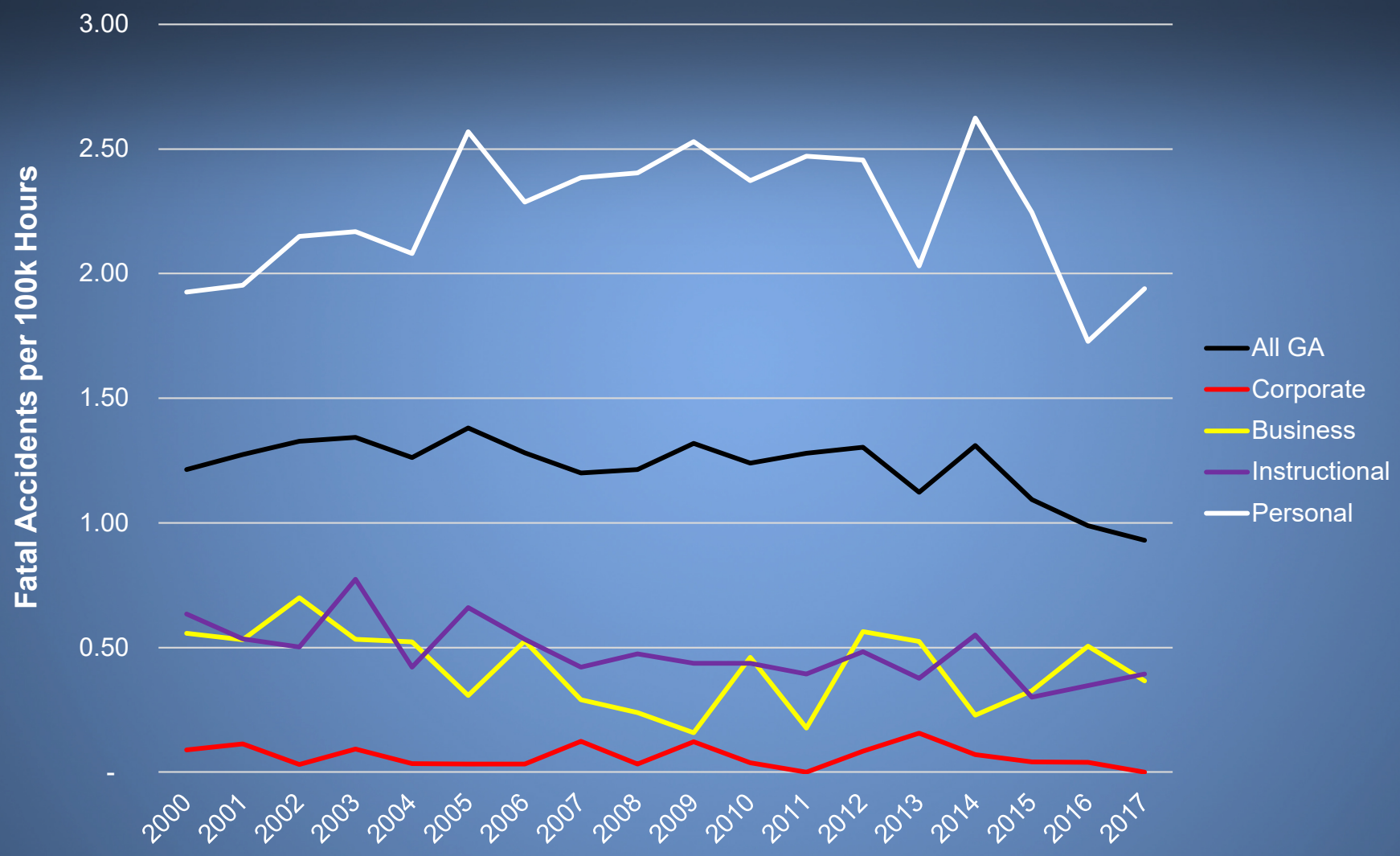
GA Accident Rates



*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.

NTSB

Fatal Accident Rates per 100k Flight Hours



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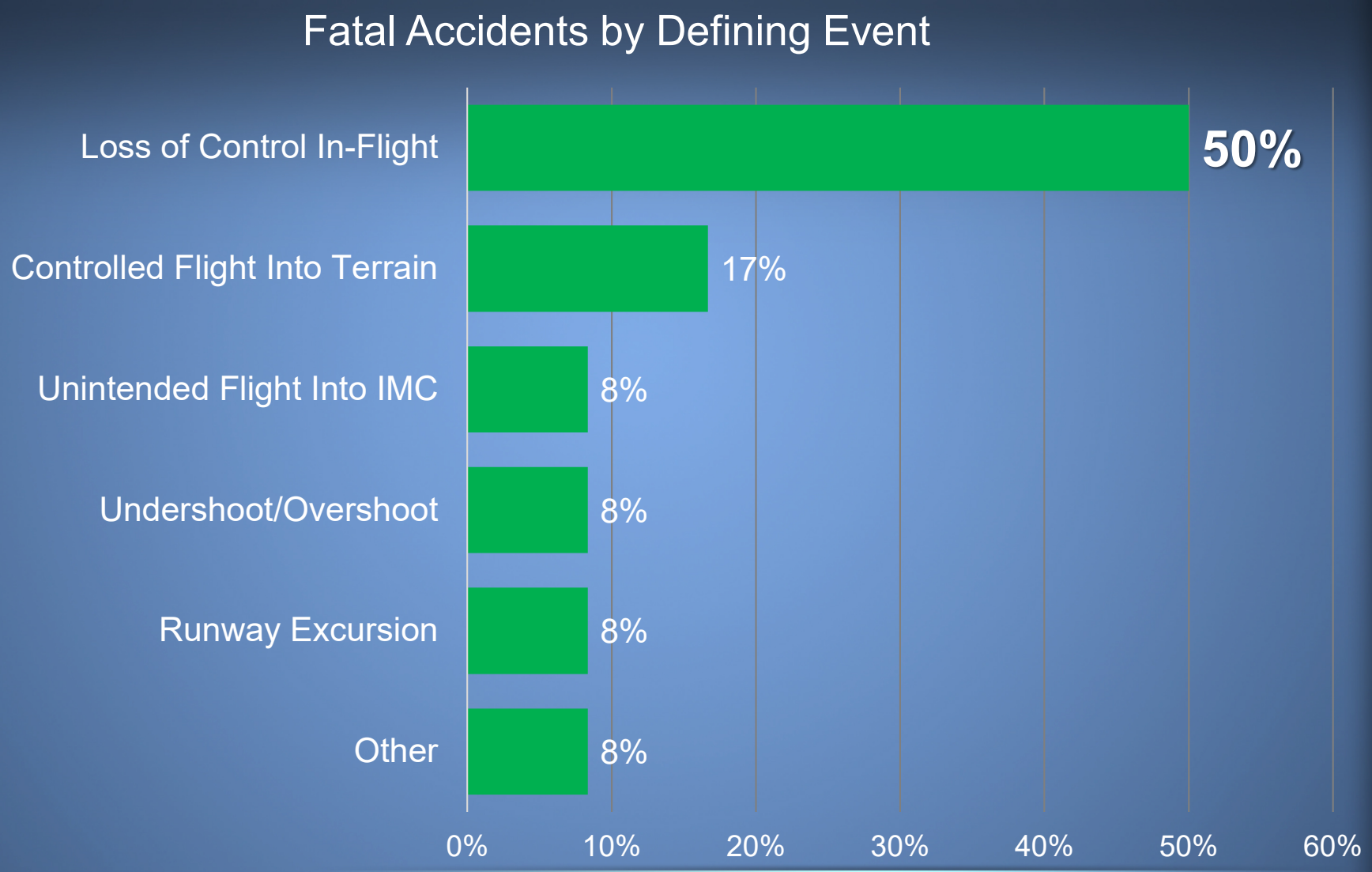
NTSB

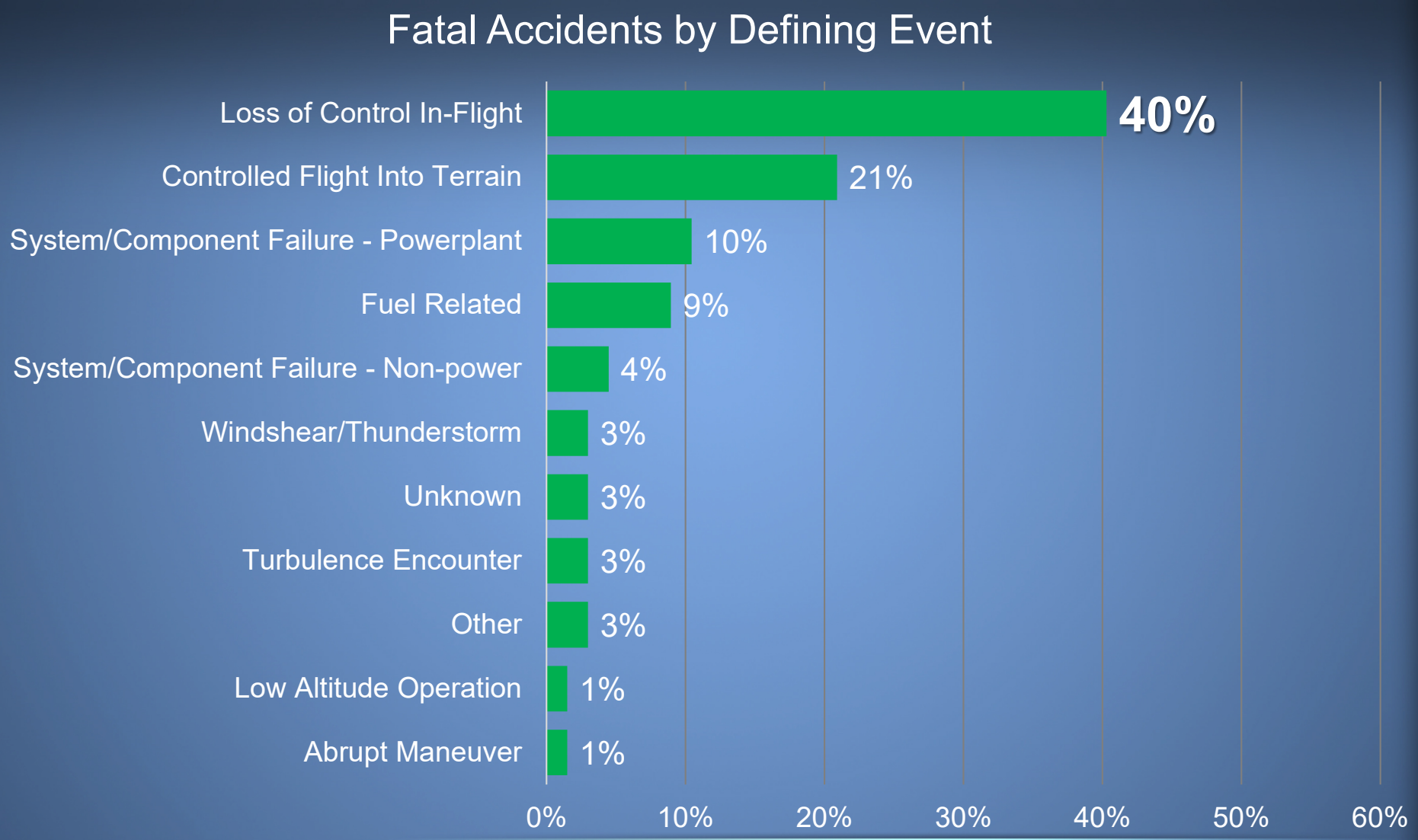
Corporate Flying, 2008-2017



Excludes cases without event data

NTSB

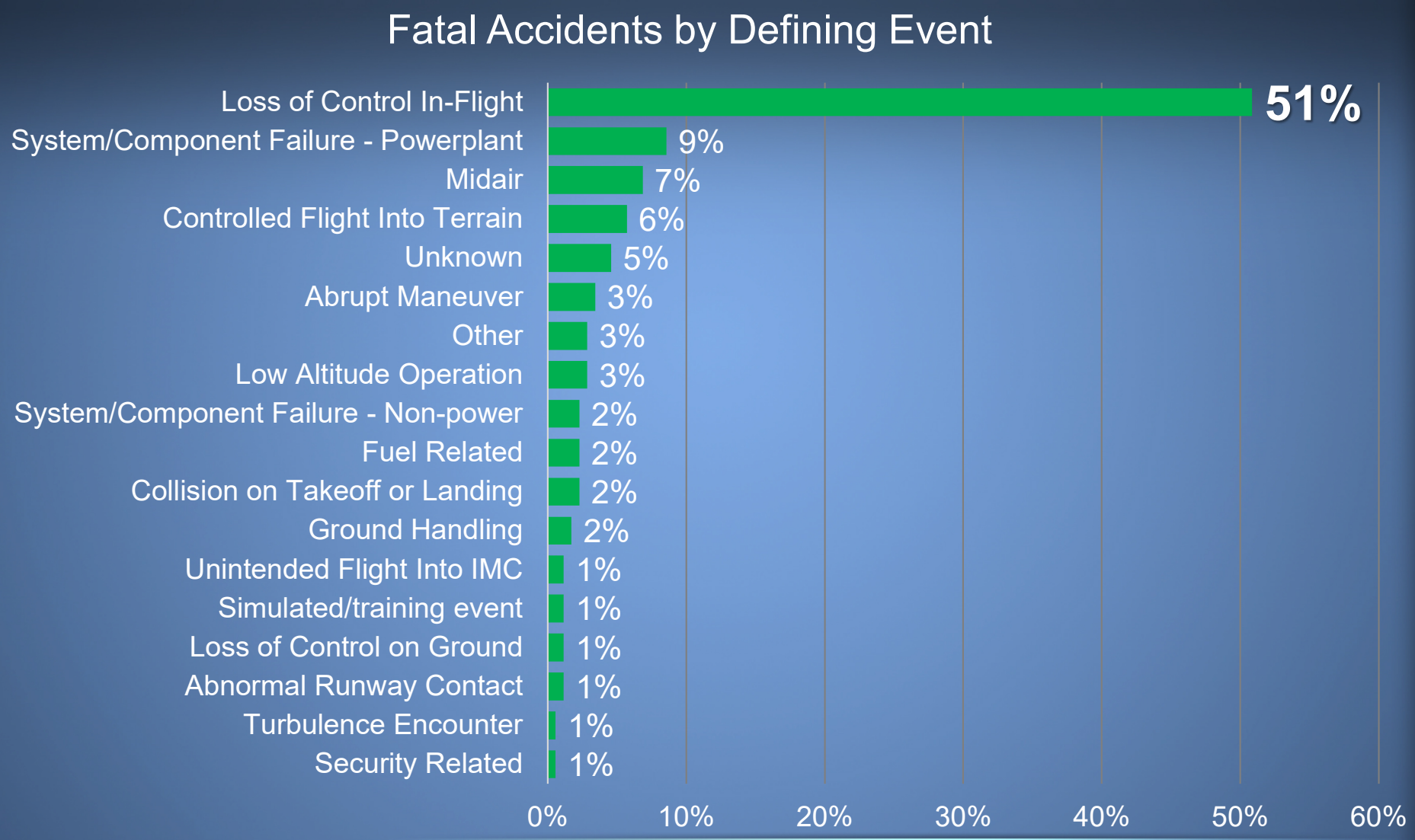
Business Flying, 2008-2017



Excludes cases without event data

NTSB

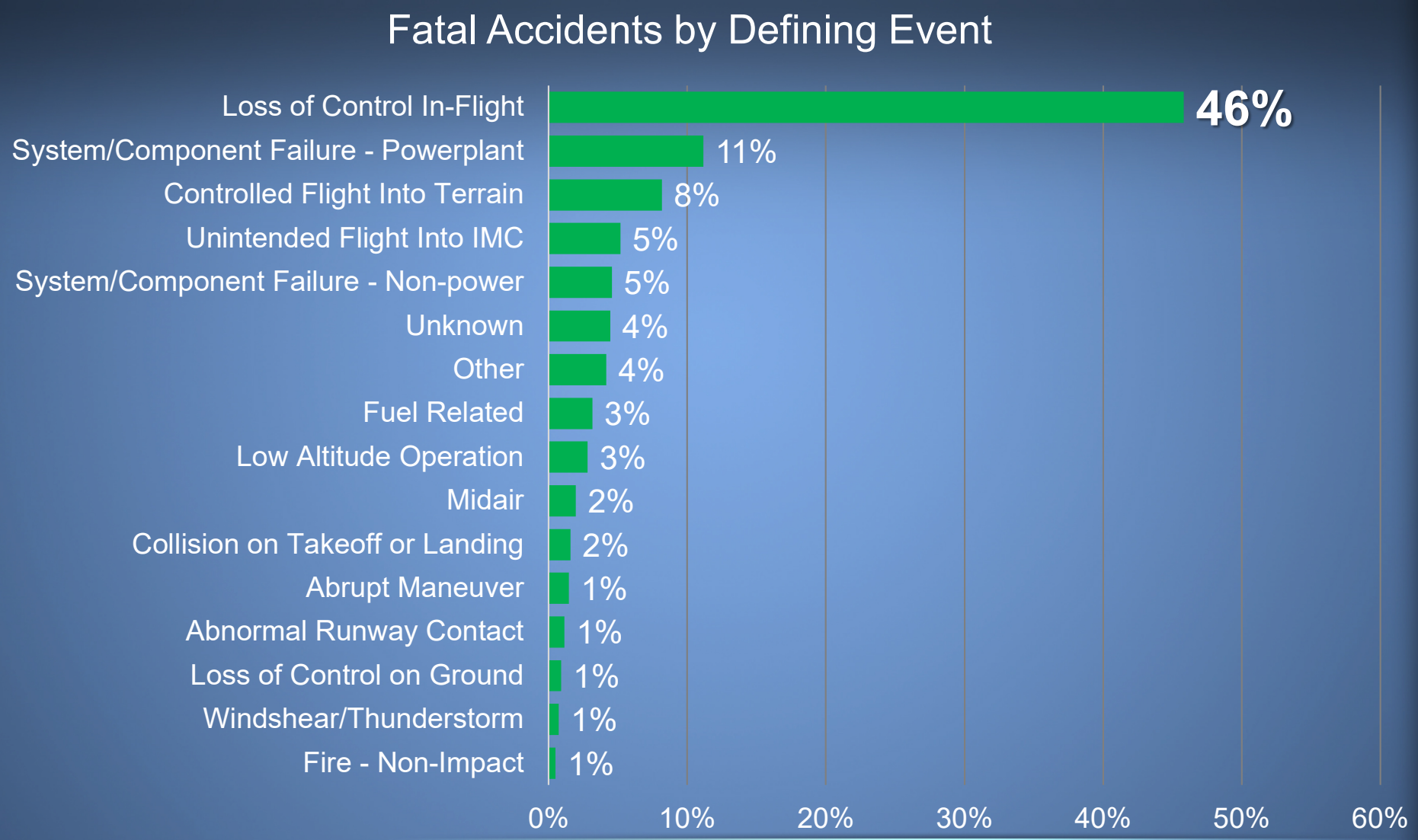
Instructional Flying, 2008-2017



Excludes cases without event data

NTSB

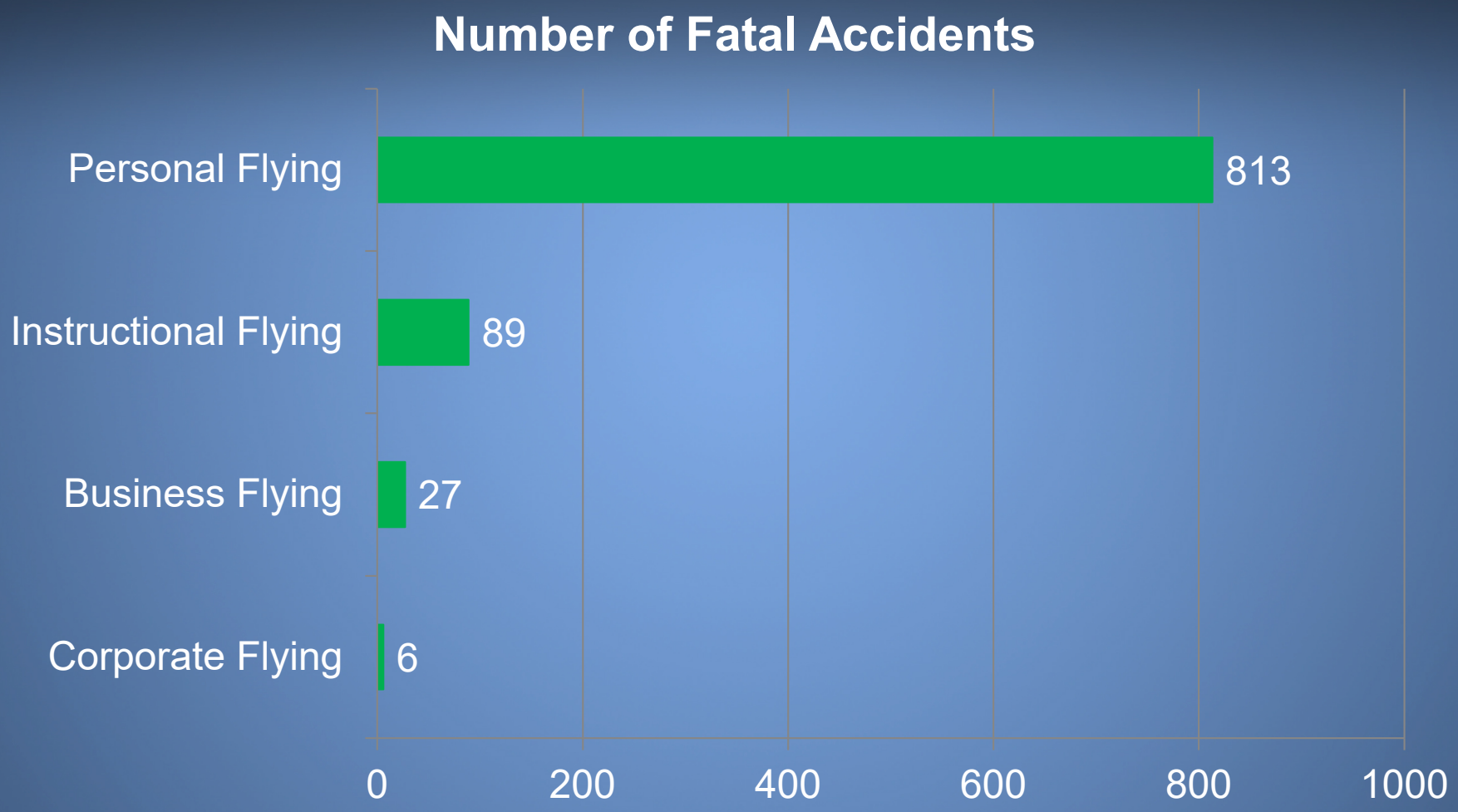
Personal Flying, 2008-2017



Excludes cases without event data

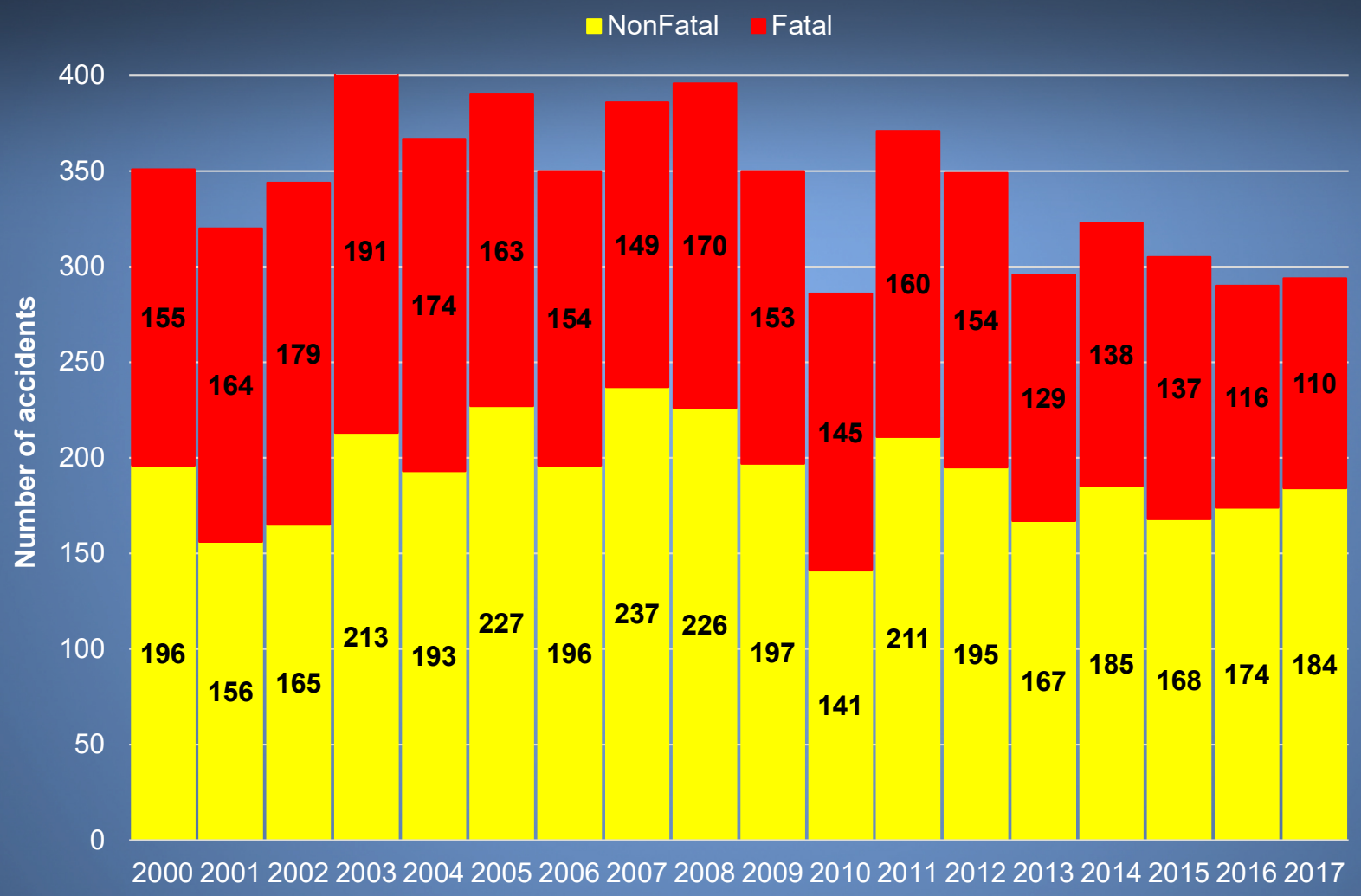
NTSB

Loss of Control In-Flight, 2008-2017



NTSB

GA LOC In-Flight Accidents



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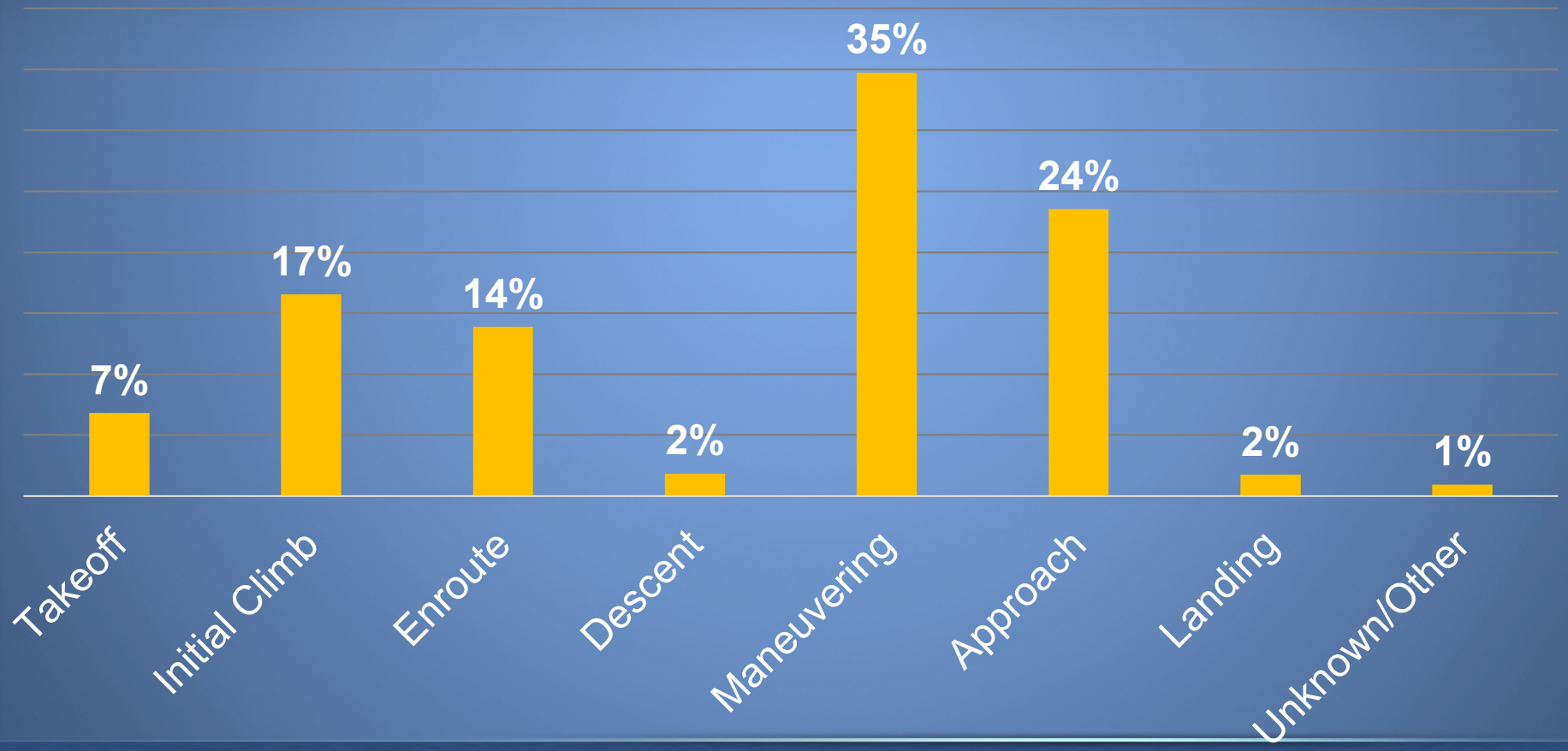
GA LOC: Where It Happens

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



Excludes cases without event data

NTSB

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
  - Maneuvering
  - Approach to landing
  - Initial Climb

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

Loss of Control

GAJSC — Who We Are…

Steering Committee

Co-chairs – Steve Gottlieb (FAA/AVP)
Sean Elliott (EAA)

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

Industry – AOPA, EAA, GAMA, NATA, NBAA, SAFE, NAFI, 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, CAP

- 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

GAJSC – Loss of Control – Approach and Landing

- First Working Group
- Reviewed 180 accidents
- Report completed 2012
- Safety interventions identified
- Safety Enhancements (SEs) developed

GAJSC – Loss of Control – Inflight SEs

- AoA Systems – new & production
- AoA Systems – existing fleet
- Aeronautical Decision Making (ADM)
- Over reliance on automation
- Transition training
- Transition Training LODA for EAB

GAJSC – Loss of Control – Inflight SEs

- Utilization of Type Clubs
- Flight Training after period of flight inactivity
- Part 135 Safety Culture
- Stabilized Approach and Landing
- Weather Technology – Weather Cameras

GAJSC – Loss of Control – Inflight SEs

- Weather Technology – Use of Available Weather Information
- Engine Monitoring Technology
- Flight After Use of Medication with Sedating Effects
- Flight with Impairing or Incapacitation Medical Conditions – Improve Medical Records

GAJSC – Loss of Control – Inflight SEs

- Flight with Impairing or Incapacitation Medical Conditions – Barriers to Communication
- Risk Based Flight Review
- Flight Data Monitoring
- E-AB/Flight Test
- Single Pilot CRM

GAJSC – Loss of Control – Inflight SEs

- Reduce Regulatory Roadblocks
  – Streamline Novel Technology
- Reduce Regulatory Roadblocks
  – Part 23 ARC
- Reduce Regulatory Roadblocks
  – Review of 14CFR 21.8 & 21.9

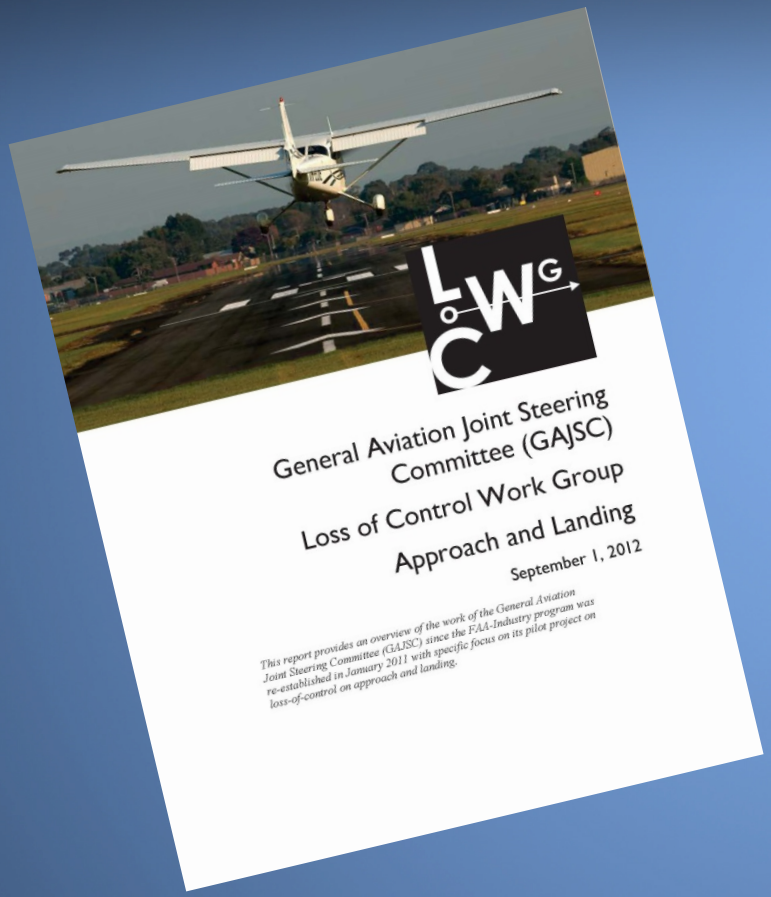
GAJSC – Loss of Control – Inflight SEs

- Pilot Response to Unexpected Events
- Medication List for Pilots
- Test Pilot Utilization and AEB Proficiency
- Airman Certification Standards

GAJSC – Loss of Control – Inflight SEs

- Safety Culture
- Safety Outreach

Loss-Of-Control Working Group



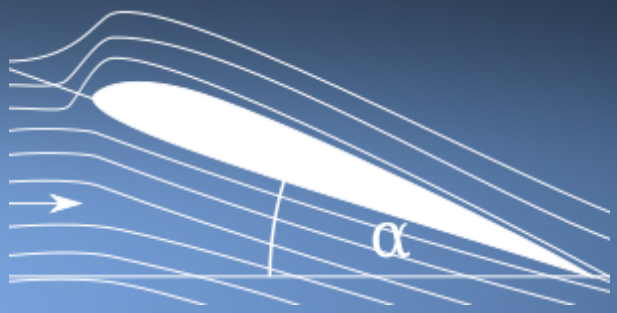
Safety Enhancements Identified

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

27 Safety Enhancements
plus
7 more with second study

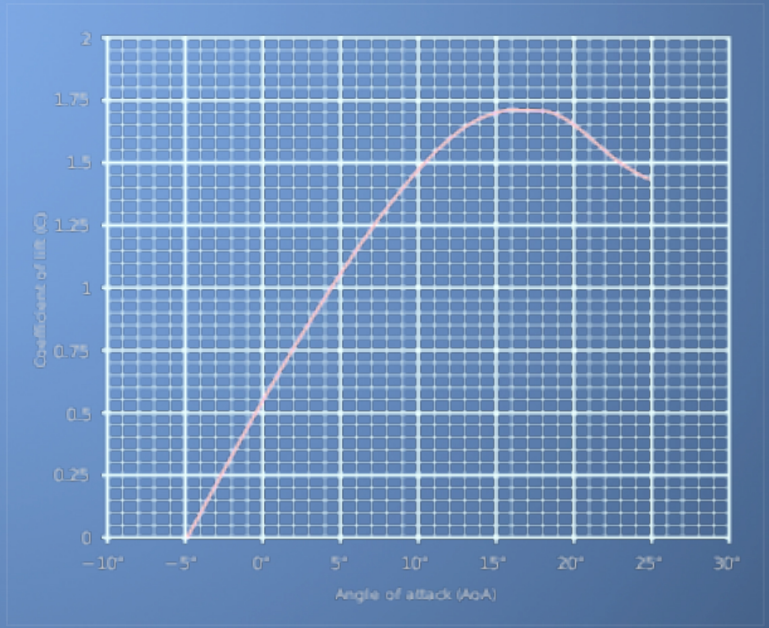
Lower Cost AOA Displays

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

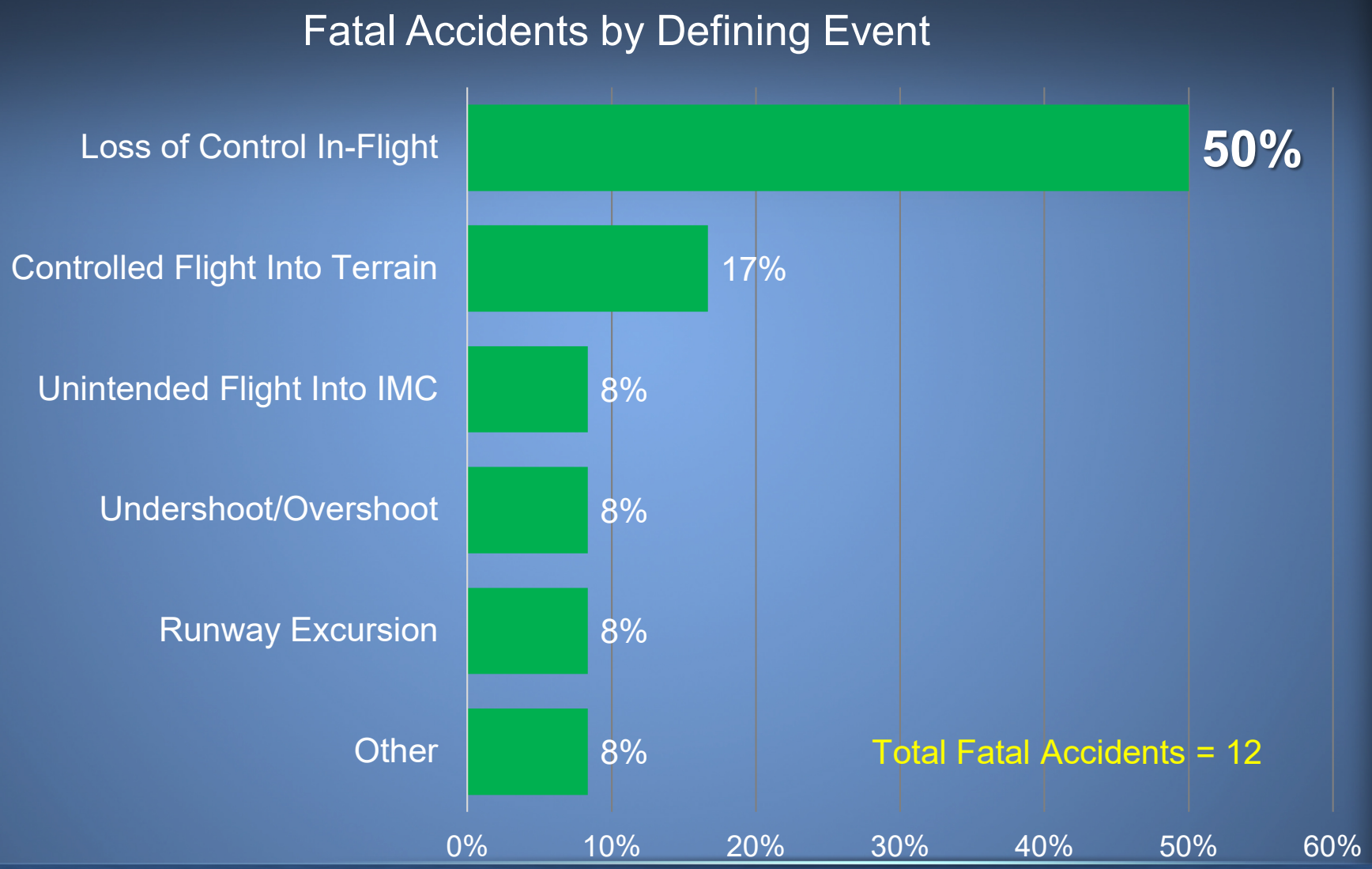


First of AOA indicators built to ASTM stds and installed as a minor mod

FAA policy changed on Non-Required Safety Equipment

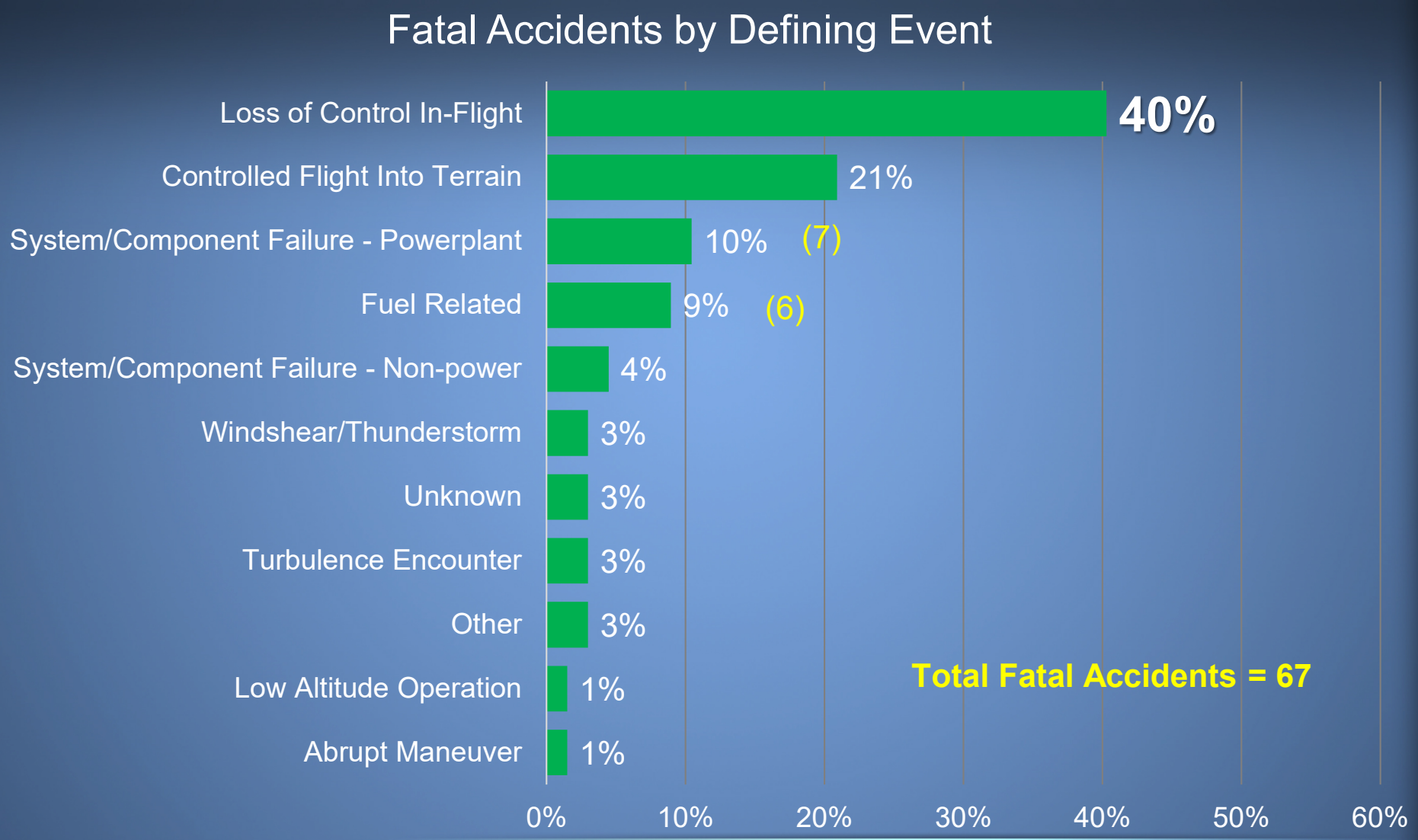


Corporate Flying, 2008-2017



Excludes cases without event data

Business Flying, 2008-2017



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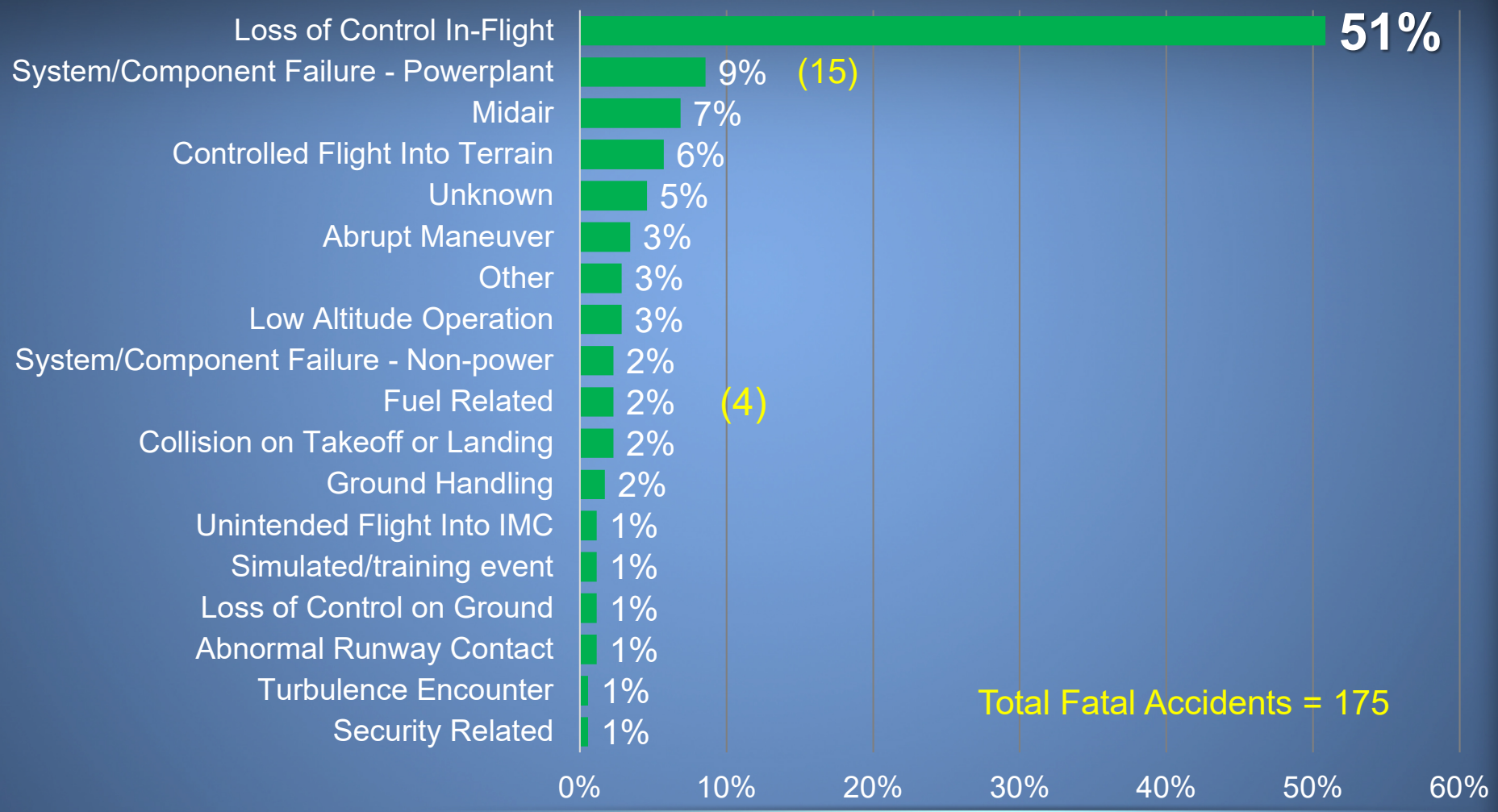
NTSB

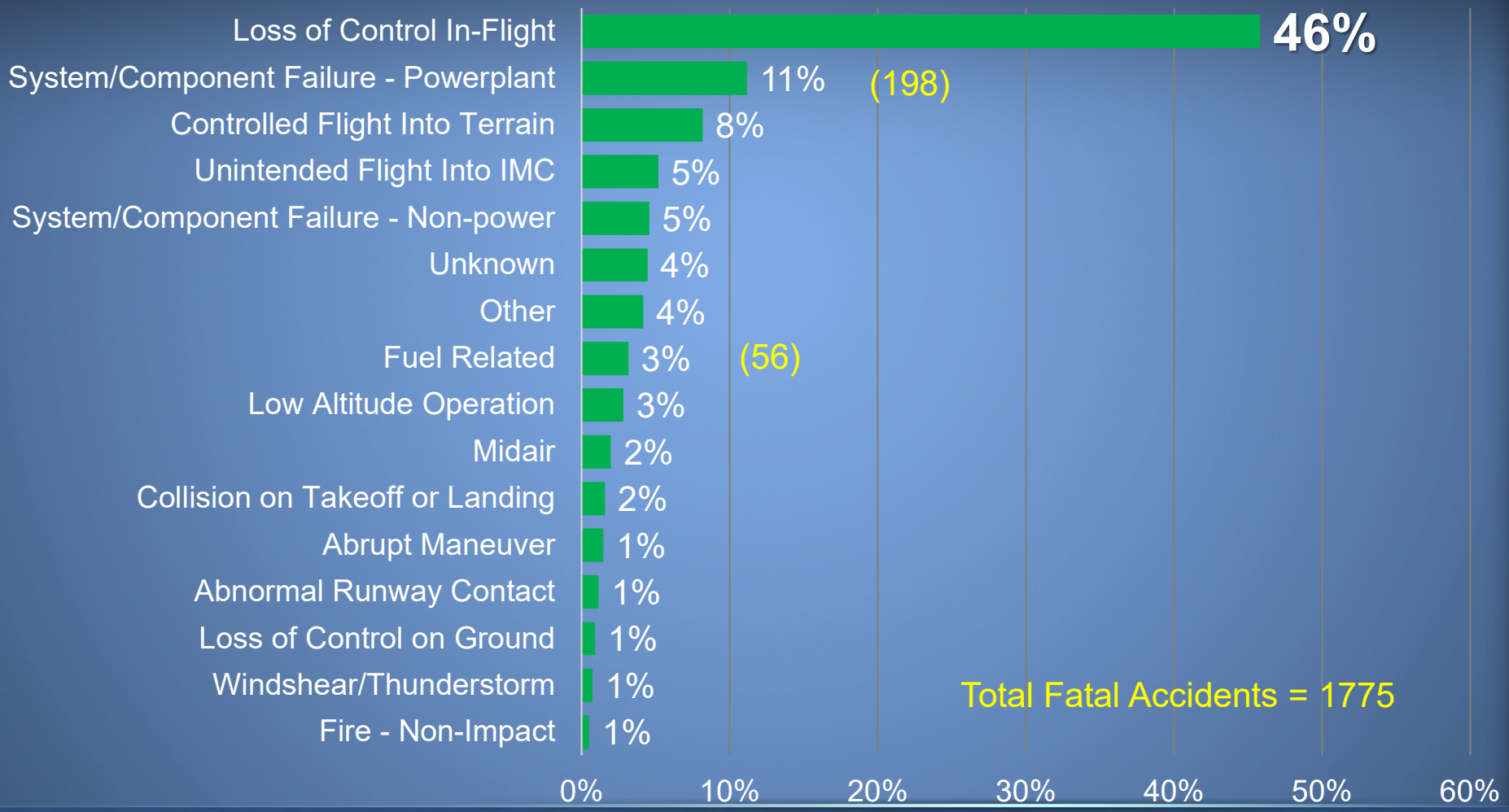
Instructional Flying, 2008-2017



Excludes cases without event data

Personal Flying, 2008-2017

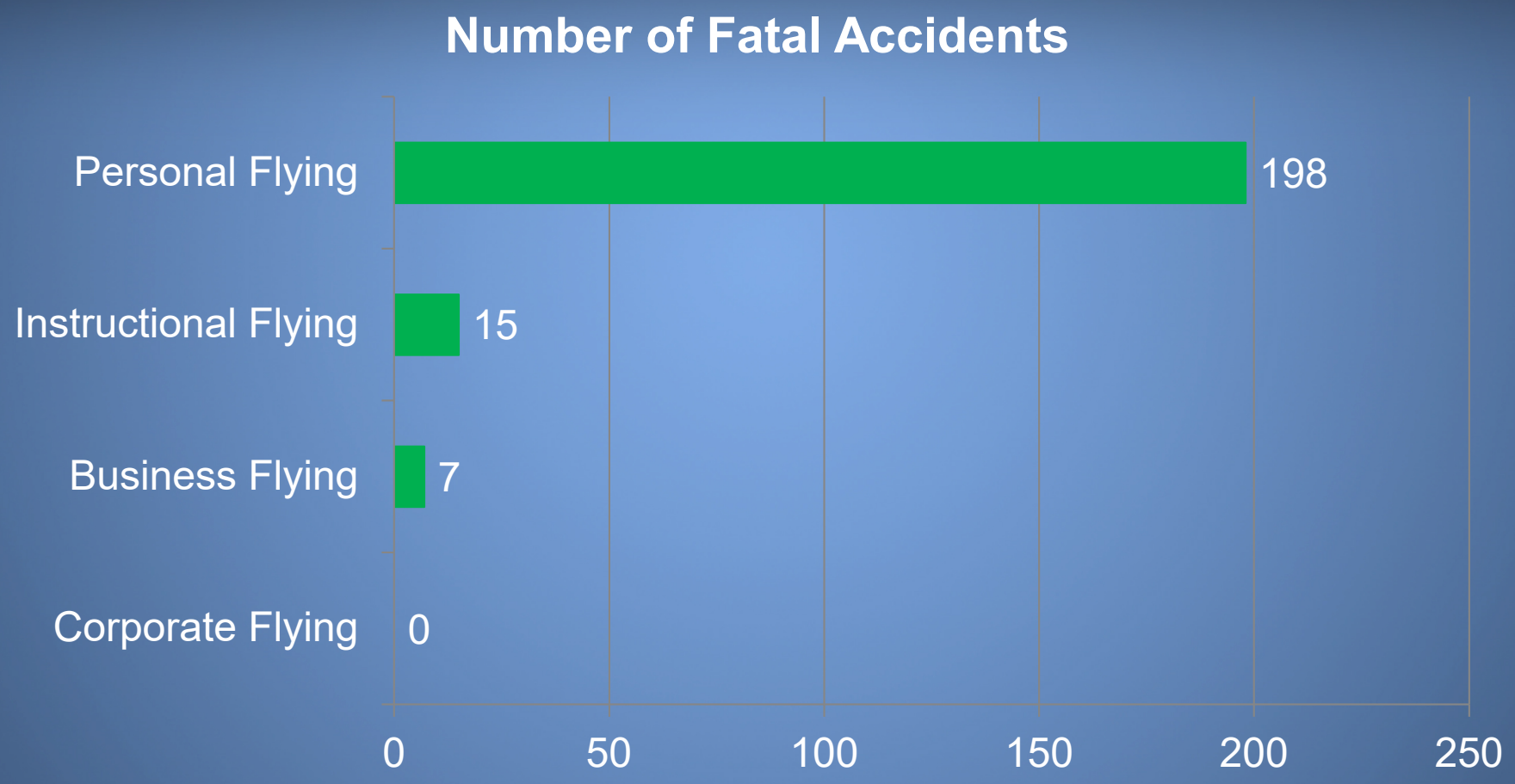
Fatal Accidents by Defining Event



Excludes cases without event data

NTSB

System Component Failure – Powerplant, 2008-2017



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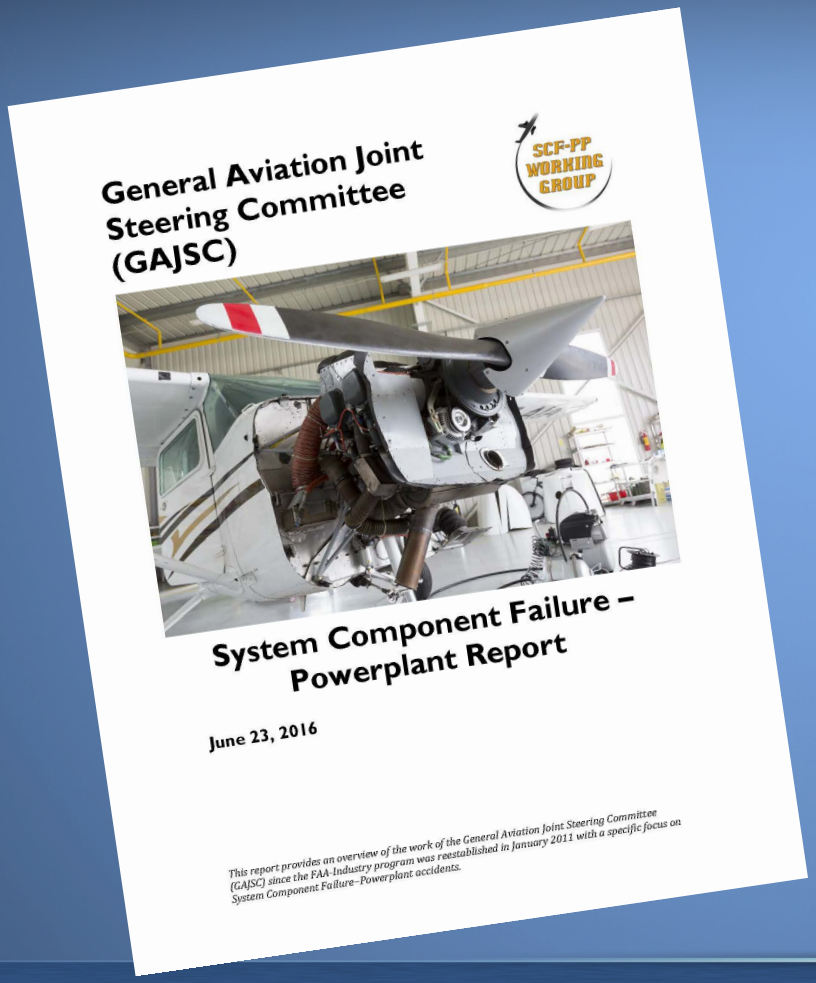
GAJSC – SCF-PP - SEs

- Mitigating the Risk of Improper Torquing
- Vmc Scenario Training
- Multi-engine Emergency Management Technology
- Smart Cockpit Technology
- Survivability
- Mitigating V-Band Clamp Failures

GAJSC – SCF-PP SEs

- Modernized Maintenance Safety Reporting System
- Maintenance Placard
- A&P Education and Training
- Ignition Systems
- SCF-PP Outreach

System Component Failure – Powerplant Working Group


General Aviation Joint Steering Committee (GAJSC)

SCF-PP WORKING GROUP

System Component Failure – Powerplant Report

June 23, 2016

This report provides an overview of the work of the General Aviation Joint Steering Committee (GAJSC) since the FAA-Industry program was reestablished in January 2011 with a specific focus on System Component Failure–Powerplant accidents.

11 Safety Enhancements

Report available at www.gajsc.org

Alfred Sheinwold

Learn all you can from the mistakes of others.

You won’t have time to make them all yourself”

Accident Investigations/data tables

Table 10. Accidents, Fatalities, and Rates, 1998 through 2017,
US General Aviation

	Accidents		Fatalities			Accidents per 100,000 Flight Hours[b]	
Year	All	Fatal	Total	Aboard	Flight Hours[a]	All	Fatal
1998	1,902	364	624	618	25,517,000	7.430	1.411
1999	1,905	340	621	615	29,246,000	6.503	1.159
2000	1,837	345	596	585	27,838,000	6.574	1.214
2001	1,727	325	562	558	25,430,000	6.775	1.270
2002	1,716	345	581	575	25,545,000	6.690	1.327
2003	1,741	352	633	630	25,997,000	6.682	1.342
2004	1,619	314	559	559	24,888,000	6.493	1.262
2005	1,671	321	563	558	23,167,712	7.204	1.381
2006[c]	1,523	308	706	547	23,962,936	6.347	1.281
2007	1,654	288	496	491	23,818,668	6.936	1.201
2008	1,568	277	496	487	22,804,648	6.867	1.215
2009	1,480	275	479	470	20,861,866	7.075	1.313
2010	1,441	271	458	455	21,688,409	6.630	1.240
2011	1,471	270	458	447	-	-	-
2012	1,472	273	438	438	20,880,993	7.045	1.303
2013	1,223	221	390	386	19,492,356	6.259	1.118
2014	1,224	256	423	413	19,617,389	6.239	1.305
2015	1,211	230	378	375	20,576,000	5.851	1.098
2016	1,267	213	386	379	21,333,747	5.925	0.984
2017[d,e]	1,233	203	330	330	21,702,719	5.667	0.931

Notes

[a] Flight hours are estimated by the Federal Aviation Administration. Miles flown and departure information for general aviation operations is not available. Also, note that the 2011 estimates are not currently available.

[b] Suicide, sabotage and stolen/unauthorized aircraft cases, included in "Accidents" and "Fatalities" but excluded from accident rates in this table are: 1998 (6 acc., 4 fatal acc.); 1999 (3, 1); 2000 (7, 7); 2001 (4, 2); 2002 (7, 6); 2003 (4, 3); 2004 (3, 0); 2005 (2, 1); 2006 (2, 1); 2007 (2, 2); 2008 (2, 0); 2009 (4, 1); 2010 (3, 2); 2011 (3, 1); 2012 (1, 1); 2013 (3, 3); 2014 (0, 0); 2015 (7, 4); 2016 (3, 3); 2017 (3, 1).

- NTSB accident files are on-line
- Most accident Dockets are on-line
  - Factual reports,
  - Interviews
  - Photographs
- www.ntsb.gov

NTSB

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

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

Beech A36 / Huggins, MO
/ June 12, 2015