NTSB National Transportation Safety Board

# General Aviation and the NTSB Most Wanted List


***NTSB Training Center***

***December 12, 2015***

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Member, NTSB

# N6529R - B36TC Bonanza



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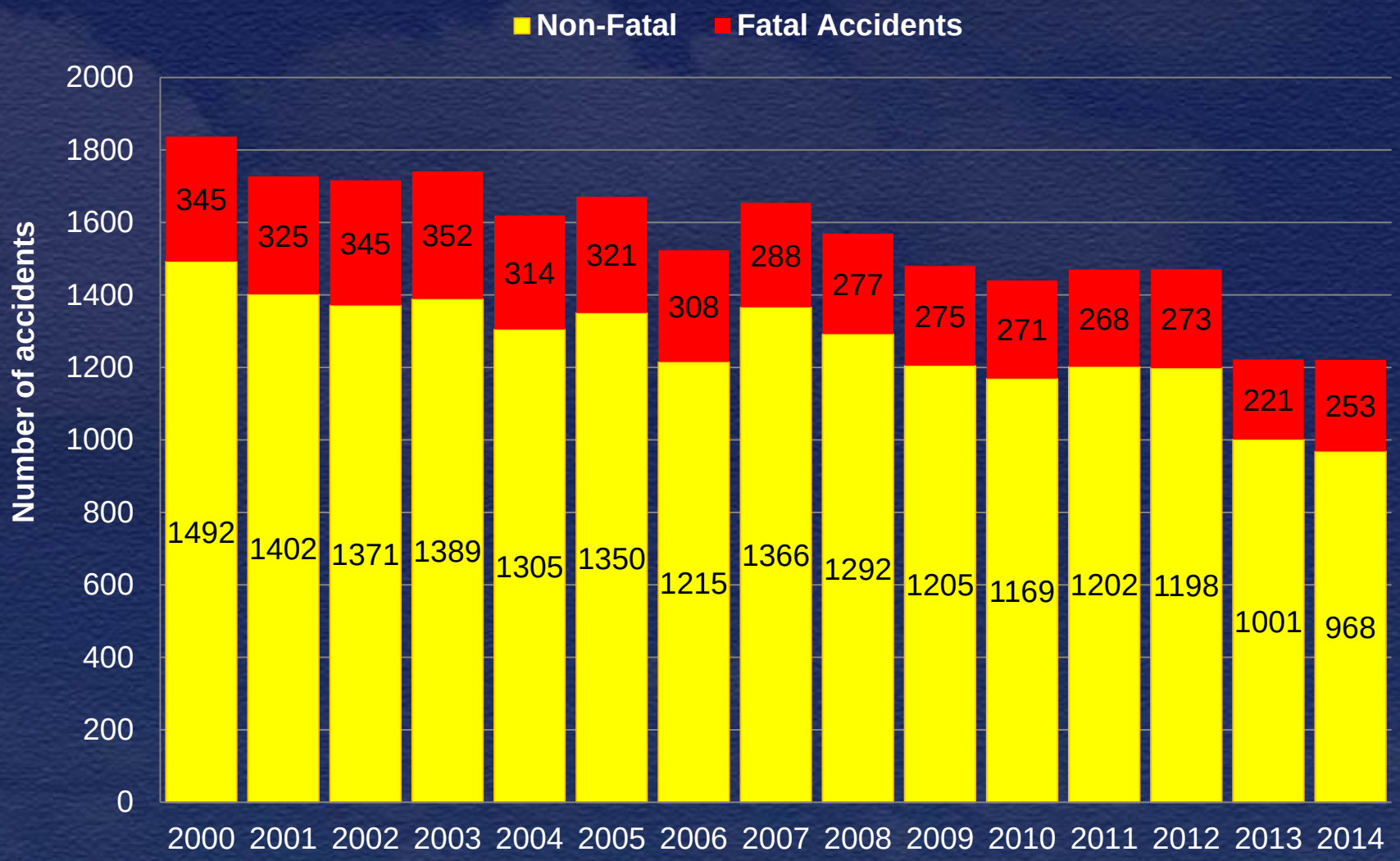
# NTSB Mission

The NTSB is an independent US federal agency charged with determining the probable cause(s) of transportation accidents, making recommendations to prevent their recurrence, conducting special studies and investigations, and coordinating resources to assist victims and their families after an accident.

# Topics

- General Aviation Accident Trends
- Most Wanted List – 2015
  - Distractions
  - Substance Impairment
  - Fitness for Duty
  - Procedural Compliance
  - Loss of Control

# All GA Accidents

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# GA Accident-involved Fatalities


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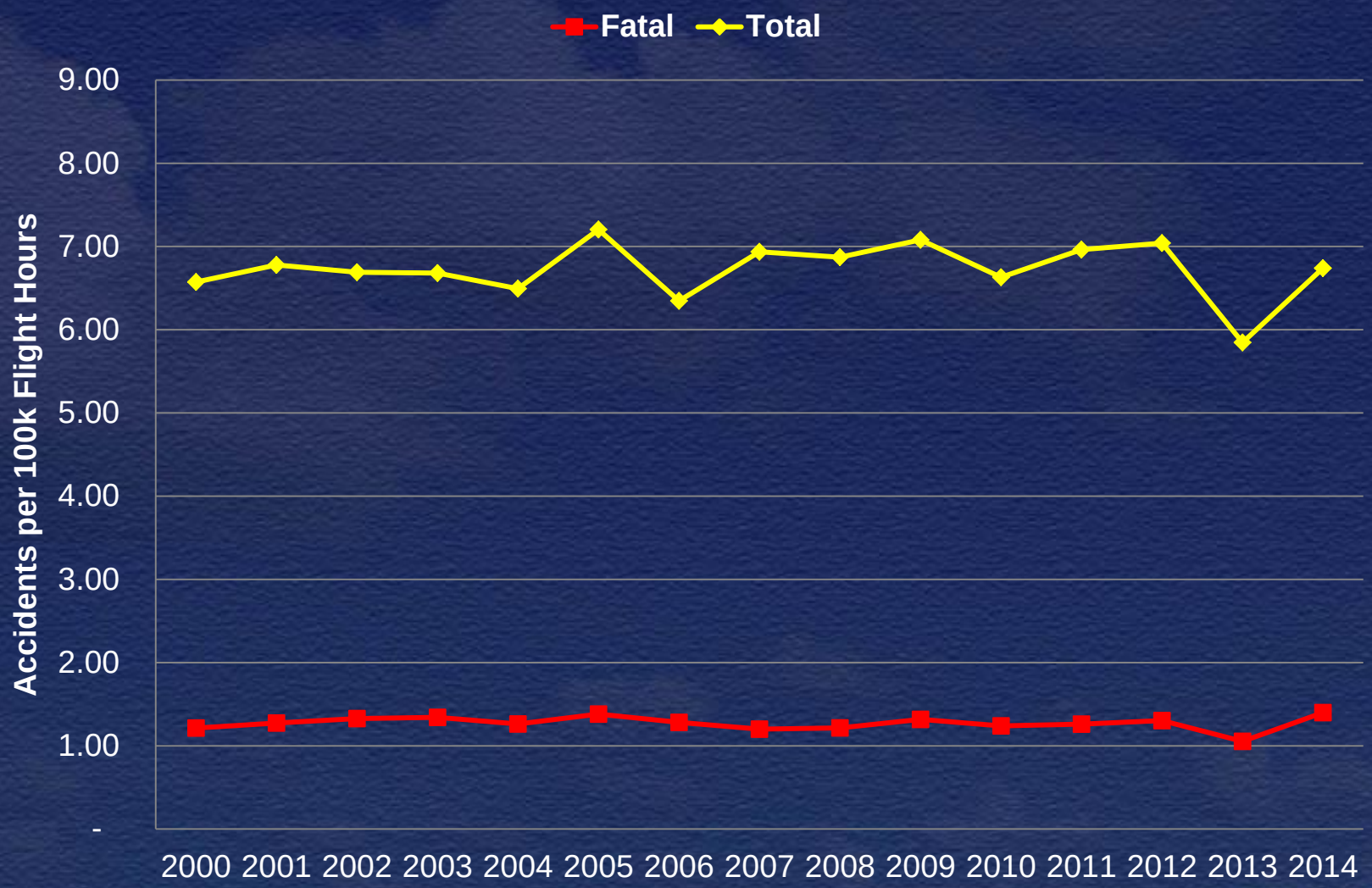
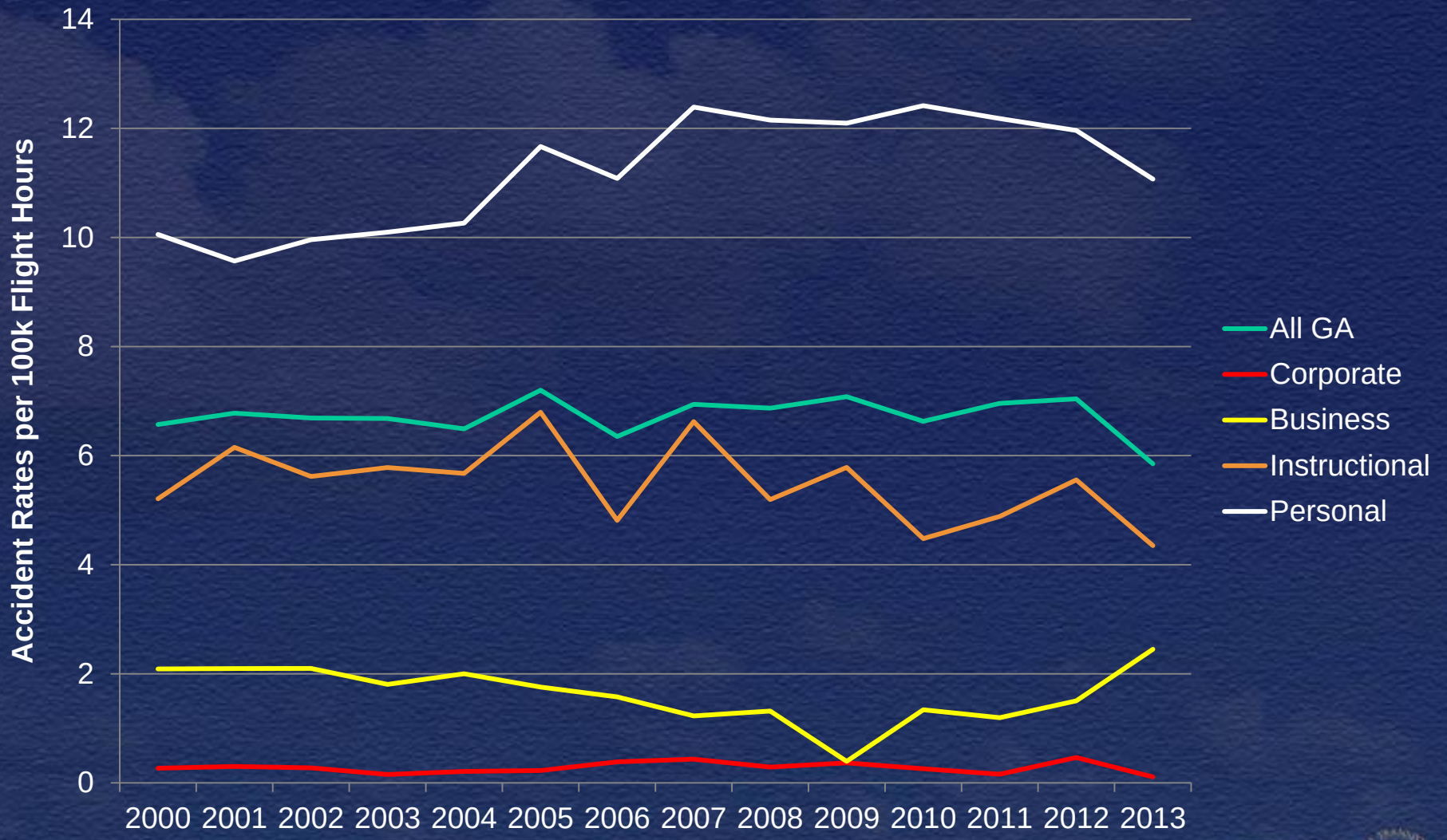
# GA Accident Rates




*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.

# Accident Rates per 100k Flight Hours

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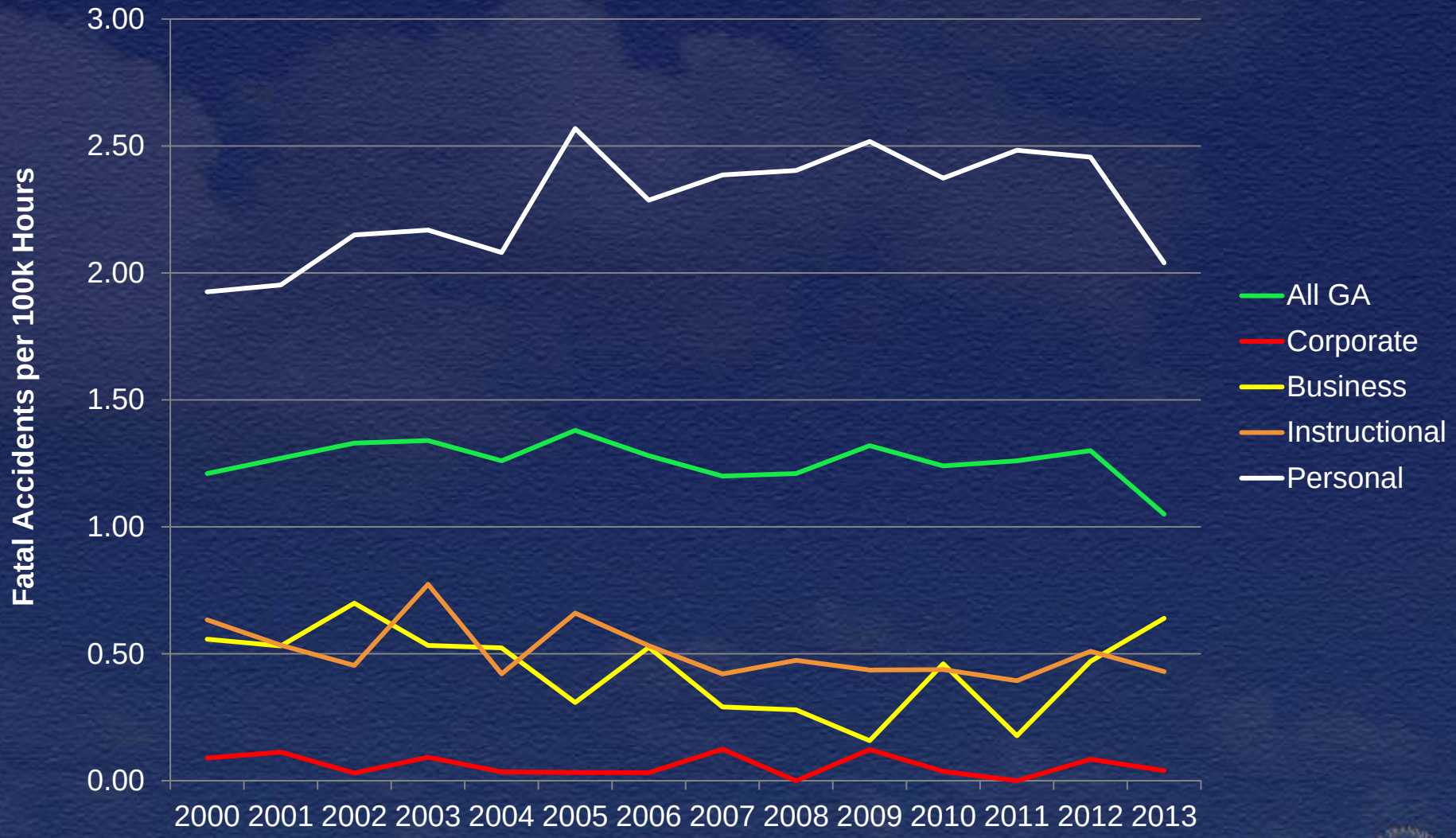
# Fatal Accident Rates per 100k Flight Hours




*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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# Defining Events – Part 91 Ops

| Business | Instruction | Personal |
|---|---|---|
| 1. Loss of Control | 1. Loss of Control | 1. Loss of Control |
| 2. CFIT | 2. Midair | 2. Powerplant Fail |
| 3. Fuel | 3. Powerplant Fail | 3. CFIT |
| 4. Component Fail | 4. CFIT | 4. Other |
| 5. Powerplant Fail | 5. Other | 5. Component Fail |

# Why GA on the Most Wanted List?

- NTSB investigates approximately 1500 GA accidents per year over the last decade
- Overall GA accident rate flat
  - Has improved little over the last decade
  - Airline accident rate decreased more than 80%
- Personal flying accident rate
  - Increased 10% over last 10 years
  - Fatal rate decreased 6% over that period
- Business flying accident rate
  - Increased 35% over last 10 years
  - Fatal rate increased 20%
- ***GA safety needs attention***



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# NTSB 2015 Most Wanted List


- Disconnect from Deadly Distractions
- End Substance Impairment in Transportation
- Enhance Public Helicopter Safety
- Implement Positive Train Control in 2015
- Improve Rail Tank Car Safety
- Make Mass Transit Safer
- Prevent Loss of Control in Flight in General Aviation
- Require Medical Fitness for Duty
- Strengthen Commercial Trucking Safety
- Strengthen Procedural Compliance



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# Gray Summit, MO – bus/vehicle/truck crash



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# Distraction




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# Distraction




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# Distraction



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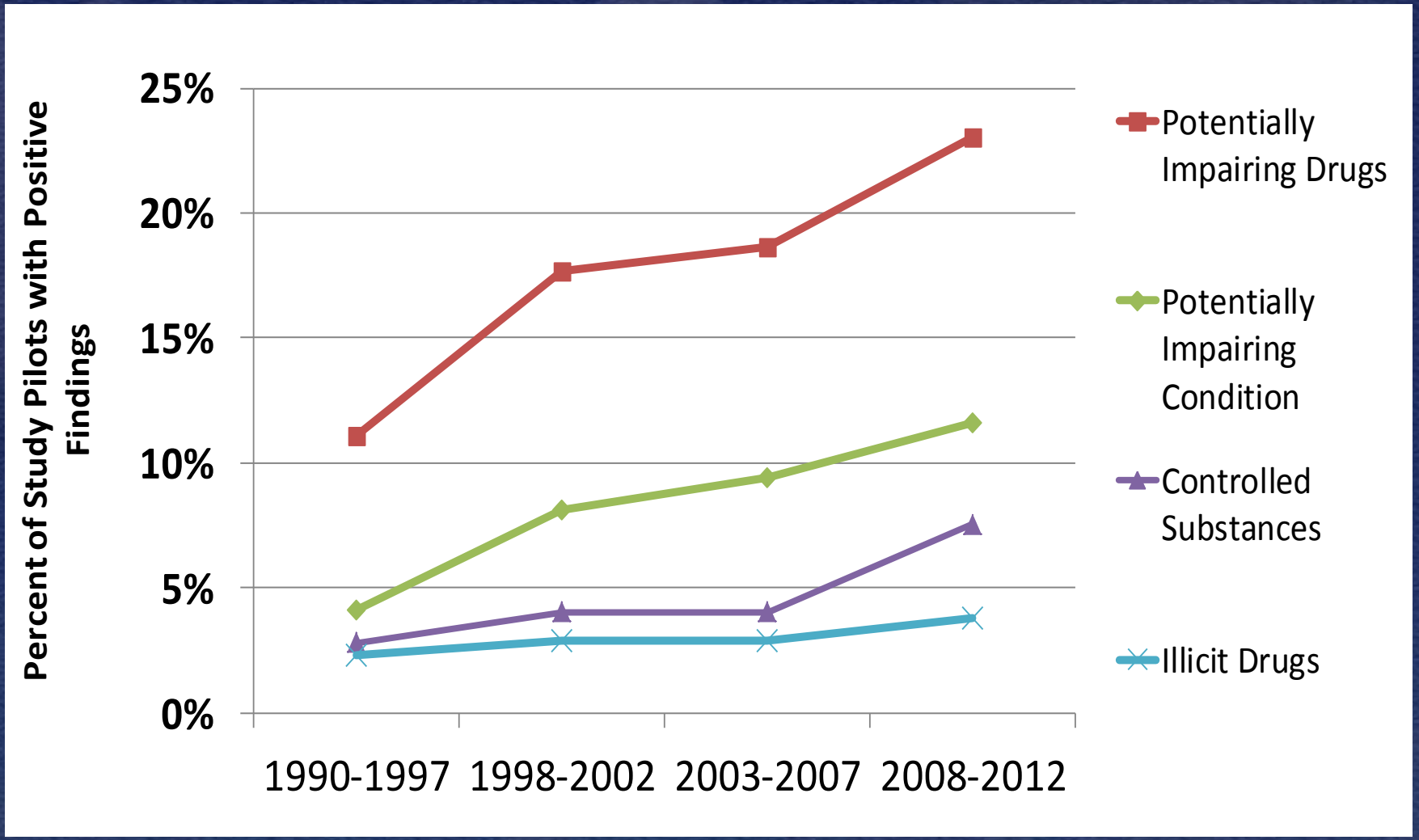
# 2015 MWL - Distractions

- ***Disconnect from Deadly Distractions***
  - A factor in all modes of transportation
- Aviation emphasis
  - Sterile Cockpit
  - Appropriate use of PEDs
  - Manage distractions

# 2015 MWL - Impairment

- ***End Substance Impairment in Transportation***
  - A factor in all modes
- Fatally injured pilots - potentially impairing drugs
  - 11% average 1990 - 1997
  - 23% average 2008 - 2012

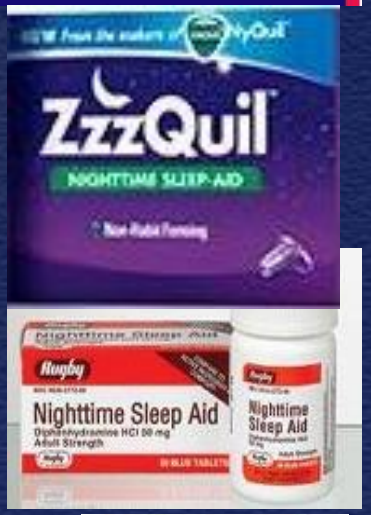
# Toxicology Findings by Category, 1990-2012



# Most Common Drugs

- Sedating antihistamines
  - Most common category
- Diphenhydramine
  - Most common individual drug
  - Most common potentially impairing drug
  - Use INCREASING









## Drug Facts

**Active ingredient (in each capsule)** — **Purpose**

Diphenhydramine HCl 25 mg ..... Antihistamine

### Uses

- temporarily relieves these symptoms due to hay fever or other upper respiratory allergies:
  - runny nose
  - sneezing
  - itchy, watery eyes
  - itching of the nose or throat
- temporarily relieves these symptoms due to the common cold:
  - runny nose
  - sneezing

### Warnings

**Do not use** with any other product containing diphenhydramine, even one used on skin

**Ask a doctor before use if you have**

- a breathing problem such as emphysema or chronic bronchitis
- glaucoma
- trouble urinating due to an enlarged prostate gland

**Ask a doctor** [illegible] taking sedatives or tranquilizers

**When using this product**

- marked drowsiness may occur
- avoid alcoholic drinks
- alcohol, sedatives, and tranquilizers may increase drowsiness
- be careful when driving a motor vehicle or operating machinery
- excitability may occur, especially in children

**If pregnant or breast-feeding**, ask a health professional before use.

**Keep out of reach of children.** In case of overdose, get medical help or contact a Poison Control Center right away. (1-800-222-1222)

### Directions

- take every 4 to 6 hours
- do not take more than 6 doses in 24 hours

| | |
|---|---|
| adults and children 12 years and over | 1 to 2 capsules |
| children 6 to under 12 years | 1 capsule |
| children under 6 years | do not use this product in children under 6 years of age |

### Other information

- store at 59° to 77°F in a dry place. Protect from heat, humidity, and light.
- **do not use if carton is open or blister unit is broken**
- see side panel for lot number and expiration date



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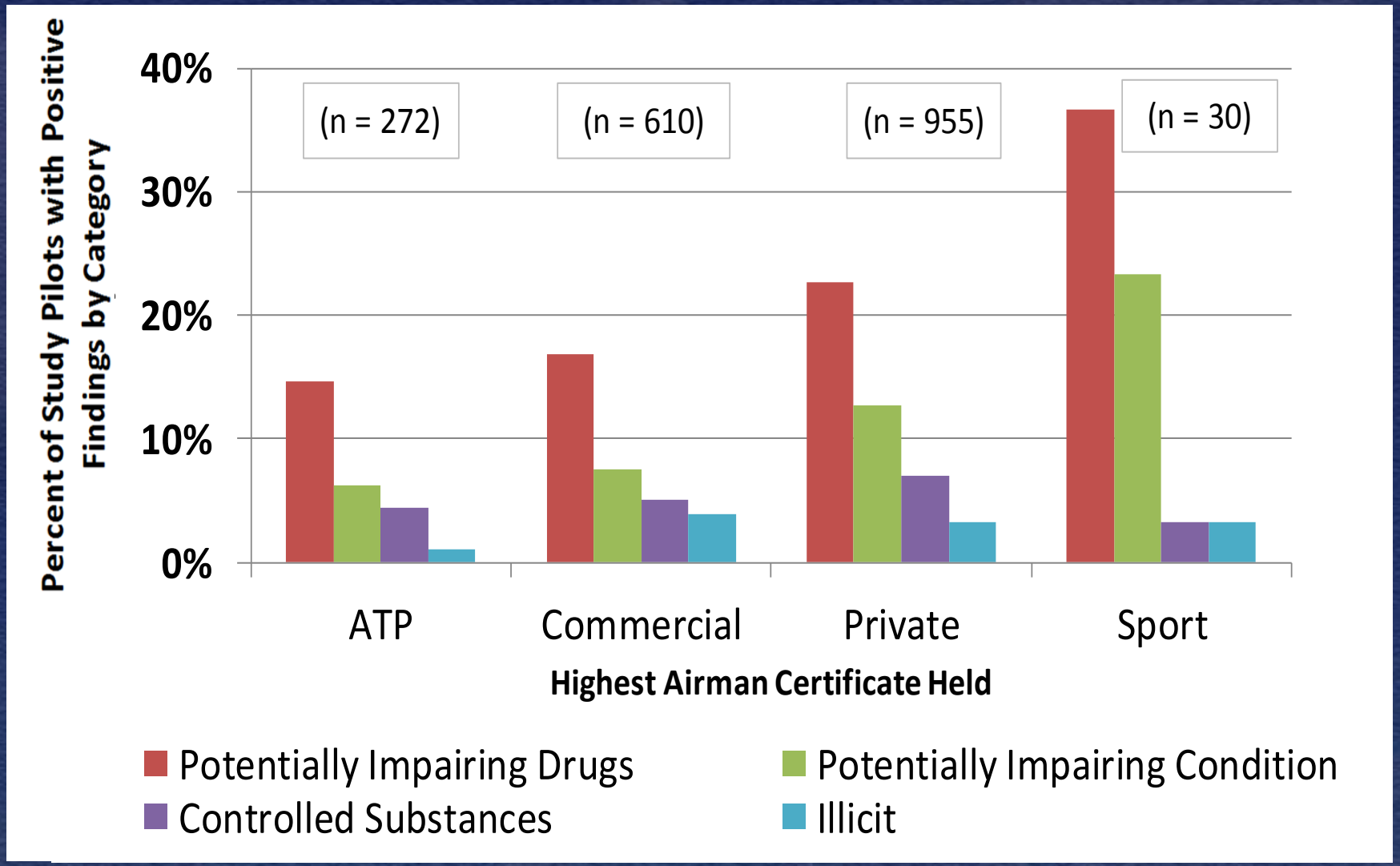
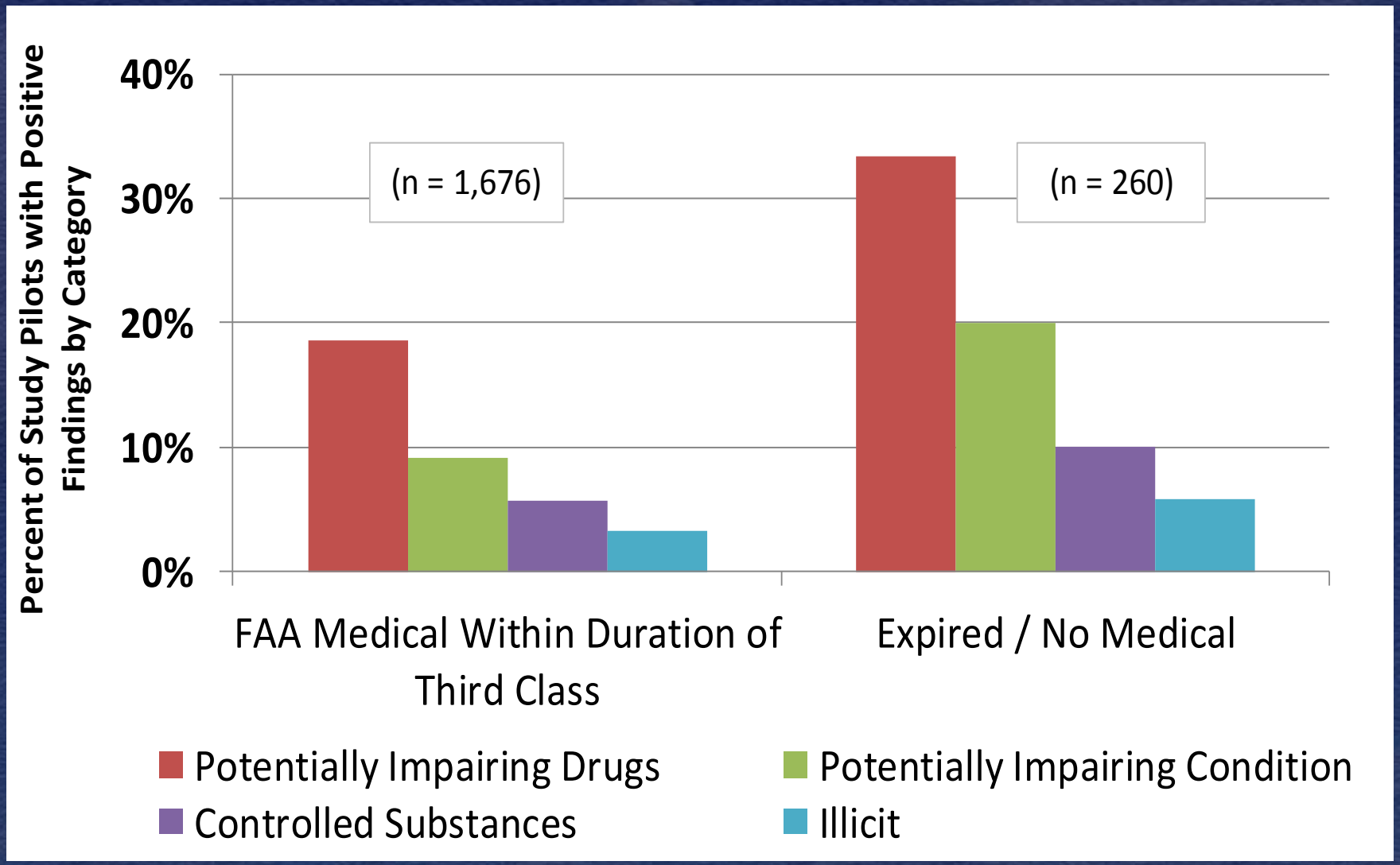
# Toxicology Findings by Certificate, 2005-2012



# Toxicology Findings by Medical, 2005-2012



# Medical Resources for Pilots

- FAA Publications
  - *Medications and Flying*
  - *Guide for Aviation Medical Examiners*
- Aircraft Owners and Pilots Association (AOPA)
  - Member resources

# Medical Resources for Pilots

- General Aviation Joint Steering Committee (GAJSC)
  - 2013 Letter to pilots
  - 2014 Initiatives
    - Drug database
    - Training course

# Fitness for Duty

# 2015 MWL – Fitness for Duty

- ***Require Medical Fitness for Duty***
  - A factor in all modes
- Airman Medical – fitness at exam time
- Pilots must self-assess fitness
  - Need for appropriate flight preparations
- Focus on medical conditions
  - Example – Obstructive Sleep Apnea
- Enhance medical knowledge

# Lubbock, TX – ATR 42-320 Cargo Aircraft

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# Procedural Compliance


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# 2015 MWL – Procedural Compliance

- ***Strengthen Procedural Compliance***
  - More than a dozen related commercial aircraft accidents in last ten years
  - Equally applicable to corporate and business operations
    - Implement well developed procedures
    - Train to the procedures
    - Emphasize and reinforce operations to the procedures

# Loss of Control

# Loss of Control



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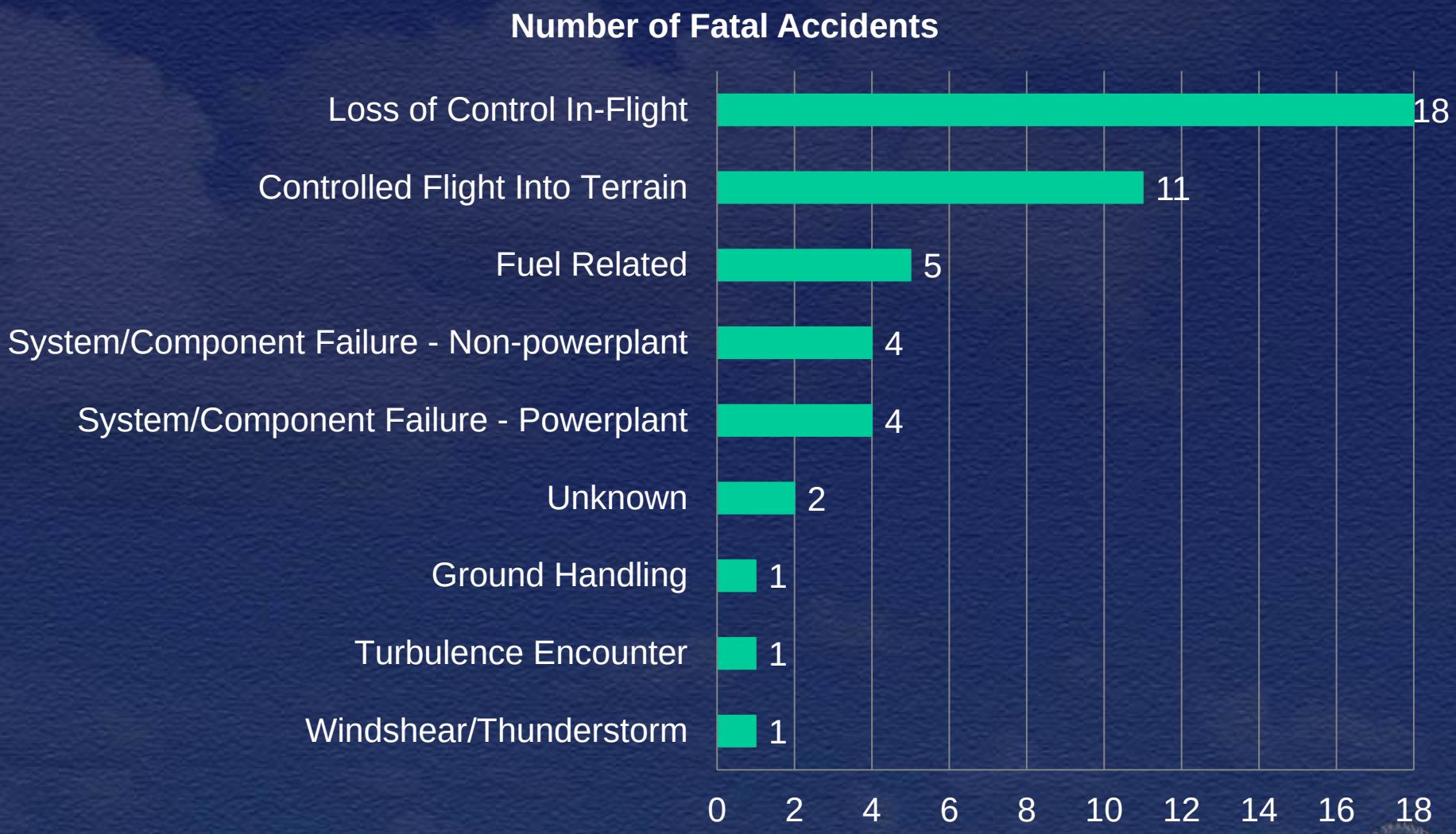
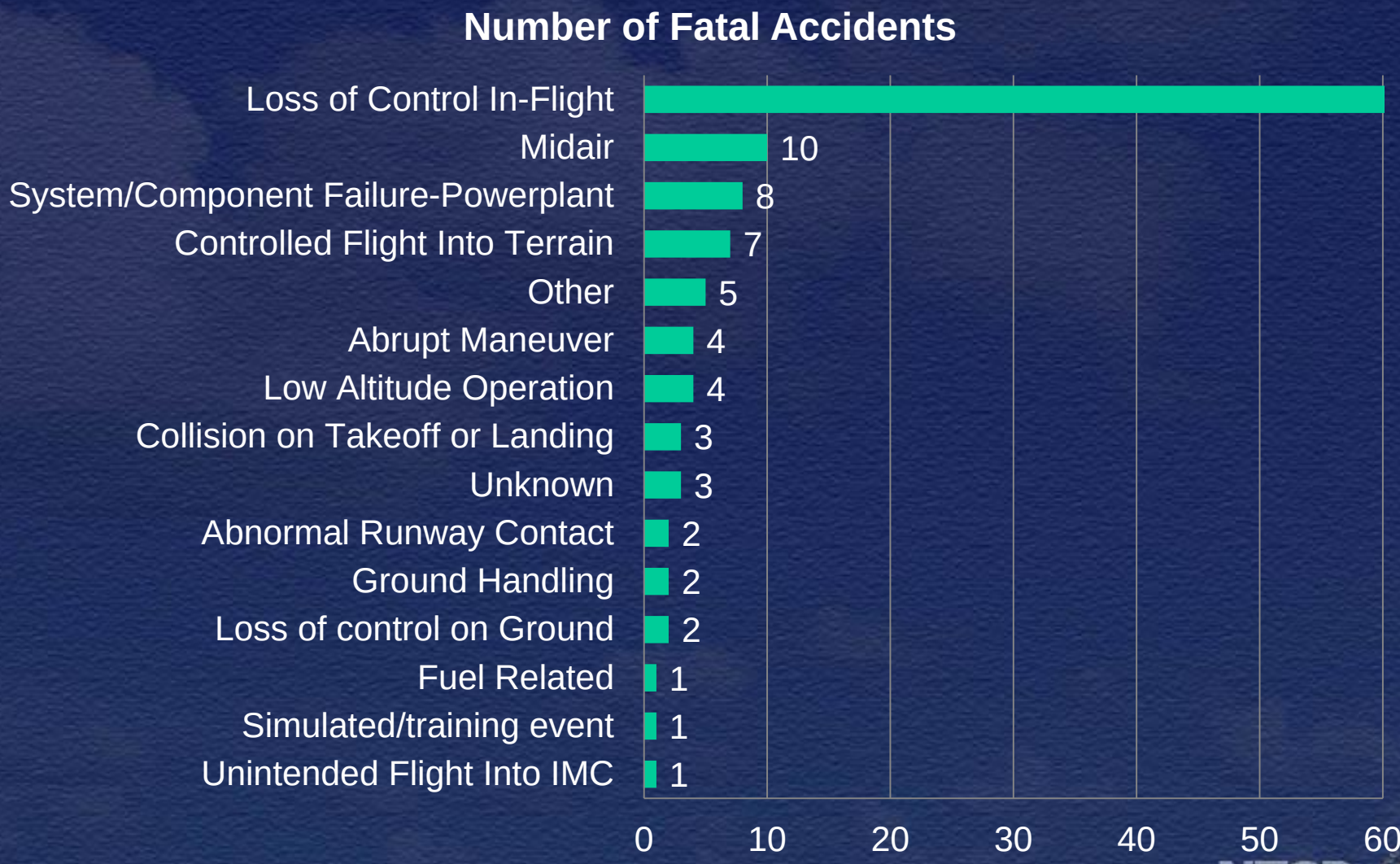
# 2015 MWL – Loss of Control

- ***Prevent Loss of Control in Flight in General Aviation***
- More than 40% fatal GA accidents were LOC during 2004 – 2014
- Most deadly flight phases
  - Approach to landing
  - Maneuvering
  - Climb

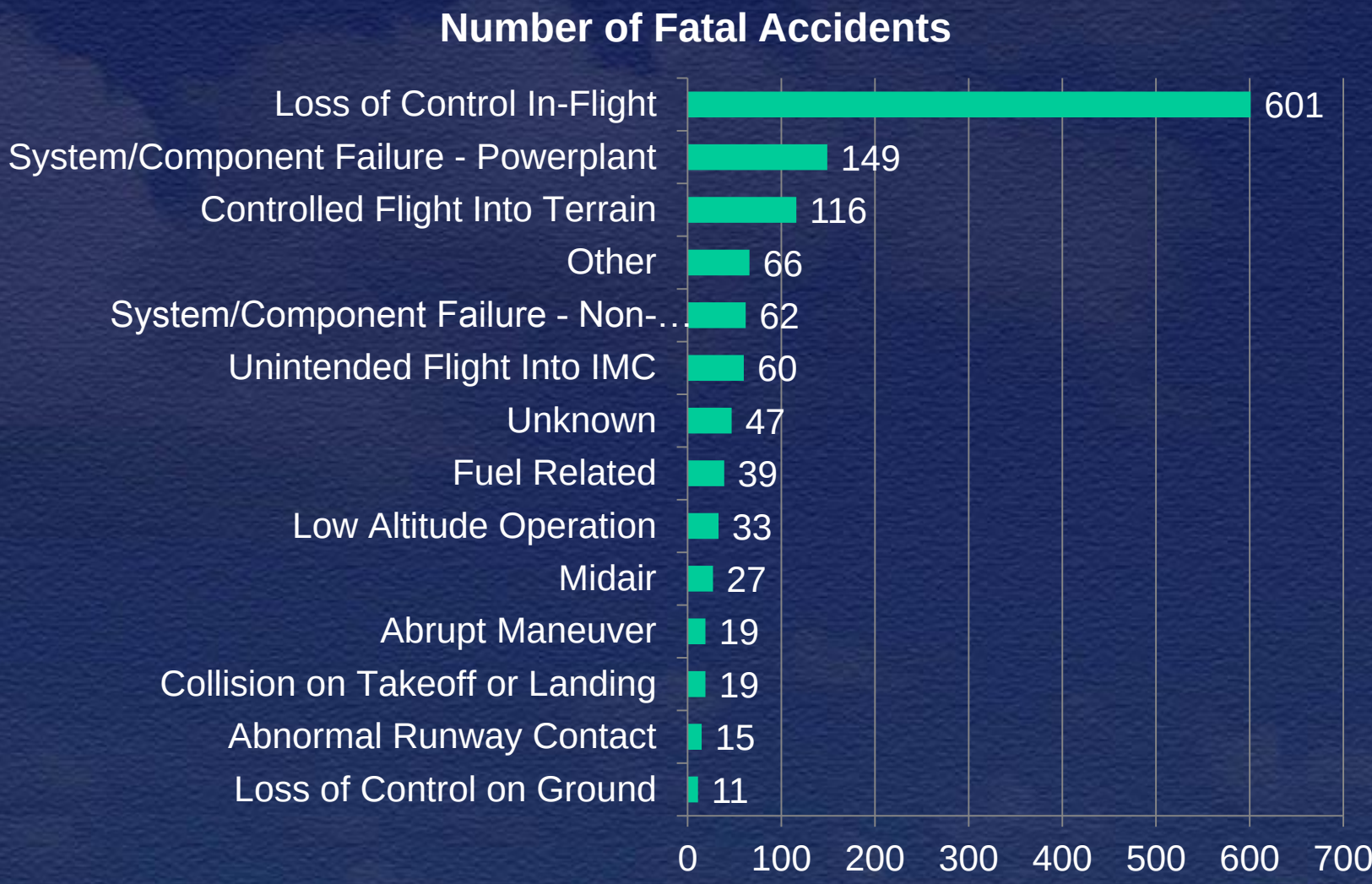
# Business Flying, 2008-2014



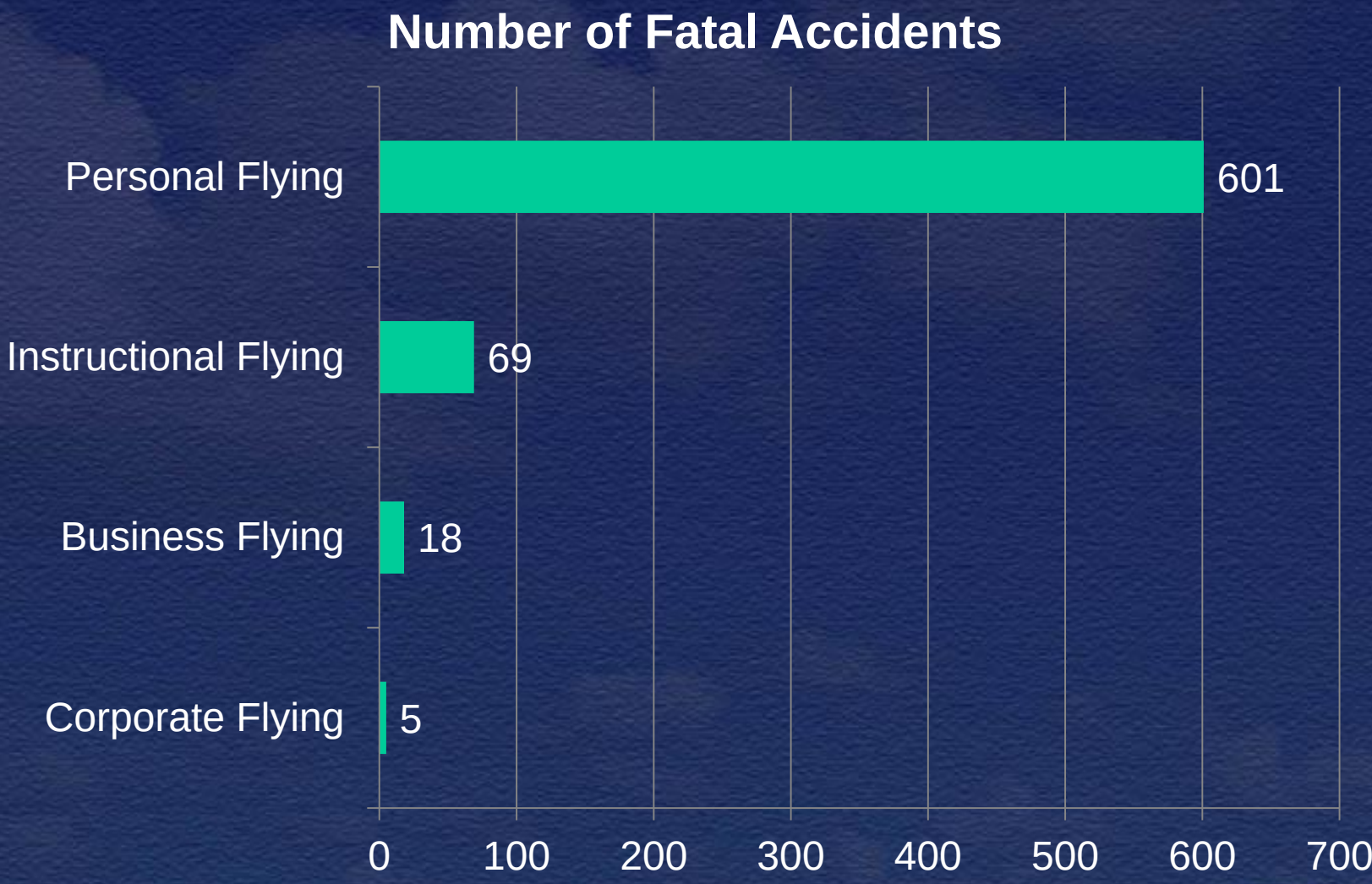
# Instructional Flying, 2008-2014



# Personal Flying, 2008-2014



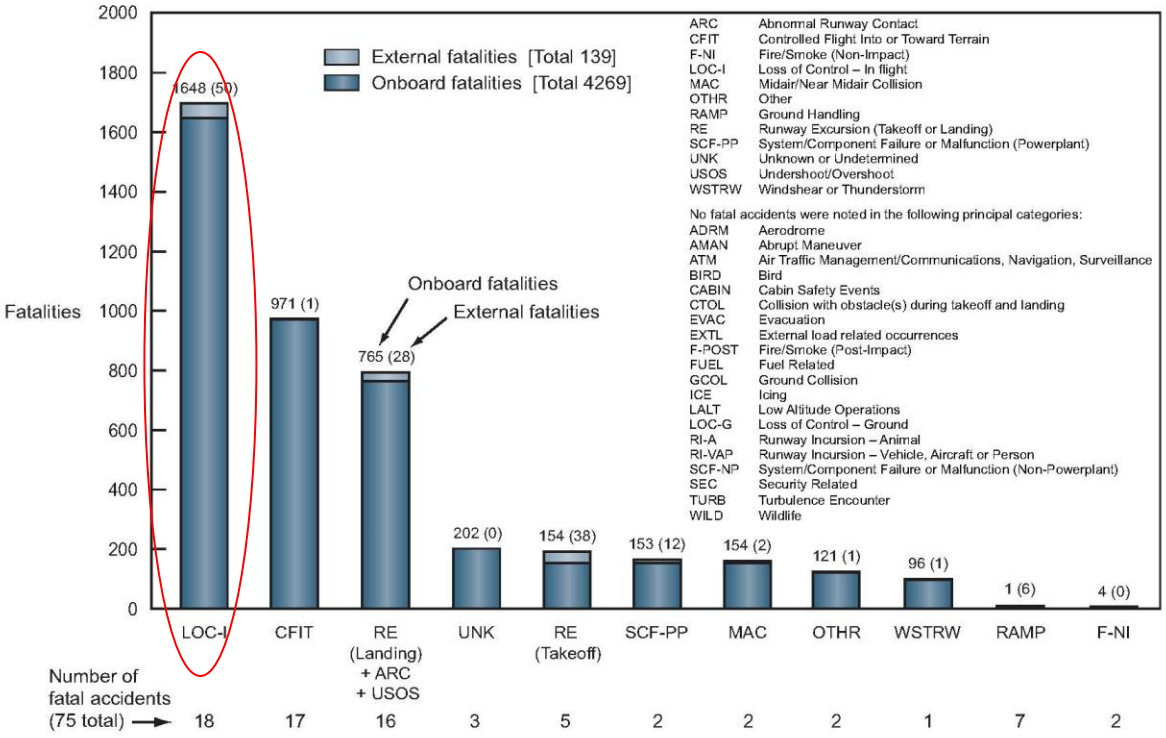
# Loss of Control In-Flight, 2008-2014



# Boeing Annual Statistical Summery

## Fatalities by CAST/ICAO Common Taxonomy Team (CICTT) Aviation Occurrence Categories

### Fatal Accidents – Worldwide Commercial Jet Fleet – 2003 Through 2012




*Note: Principal categories as assigned by CAST.*

*For a complete description of CICTT Aviation Occurrence Categories, go to: http://www.intlaviationstandards.org/*

# Primary category of accidents

| | | |
|---|---|---|
| Personal flying | – | LOC |
| Instructional flying | – | LOC |
| Business flying | – | LOC |
| Corporate flying | – | LOC |
| Airline flying | – | LOC |

# Fatal Airport LOC 2008-2014

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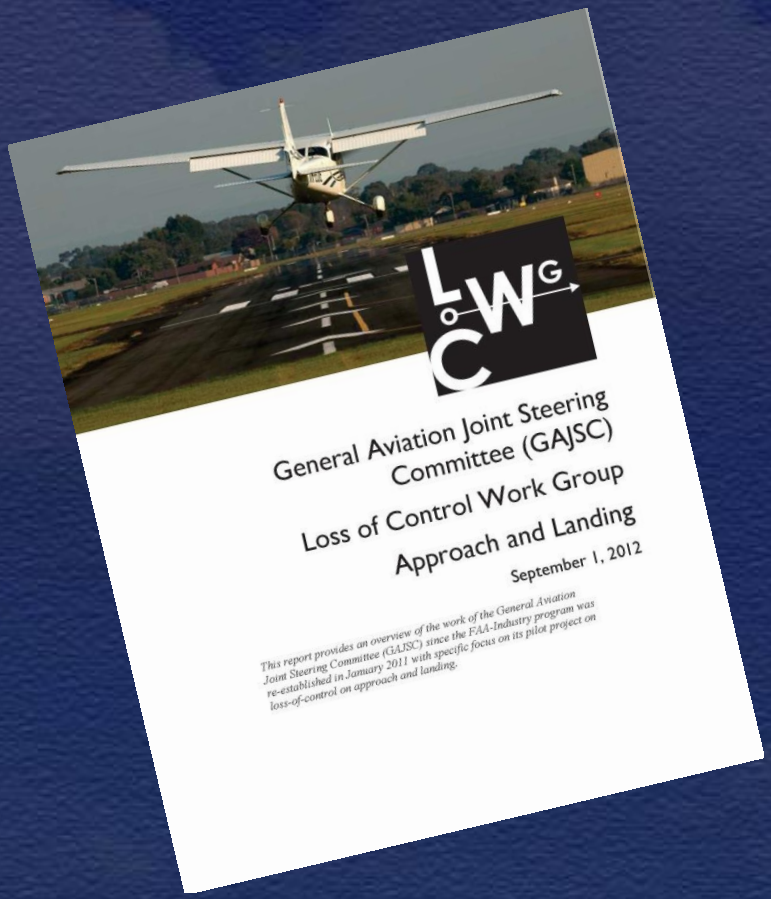
# Loss-of-control Working Group




Safety Enhancements Identified

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

28 Safety Enhancements



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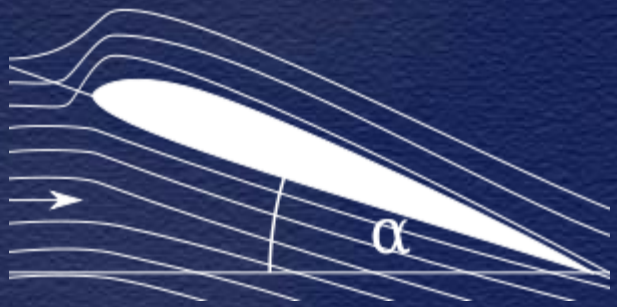
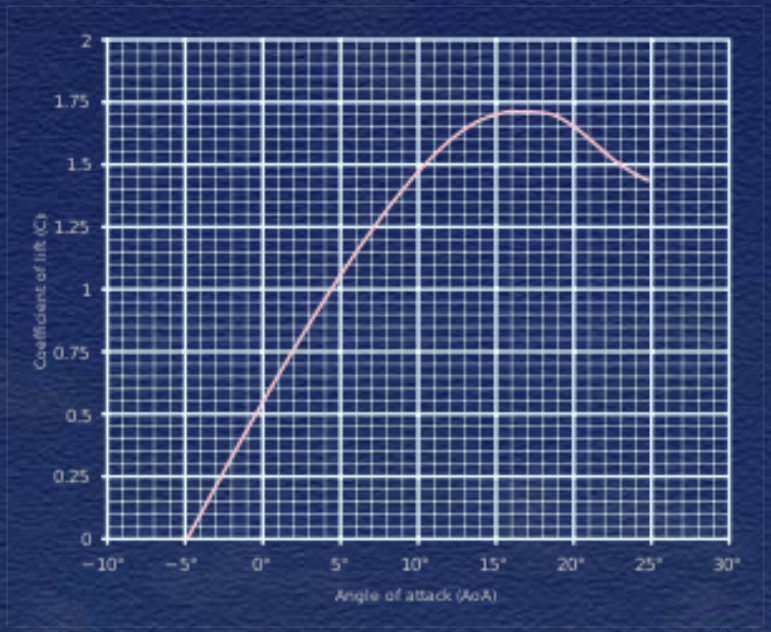
# Lower Cost AOA Displays

- 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 installation policy changed



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# Stall Recovery

- Reduce the angle-of-attack below stall AOA (Max CL)
  - Push over to eliminate stall warning
- Level wings
- Adjust thrust
  - Avoid overspeed and high G levels
- Pitch back to level flight
- Don't try to "***Power out of a stall***"

# NTSB Safety Alerts

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SAFETY ALERT
National Transportation Safety Board

**Preventing Rote Callouts**

**Confirm Cockpit Indications Before Making Callouts**

*The problem*

- Recent National Transportation Safety Board investigations have identified several instances in which pilots made callouts without first verifying the cockpit indication that corresponded with the callout.
- In these cases, the pilots acted out of habit and made callouts based on what they expected to see regarding the cockpit indication but did not take the time to verify it.
- Examples of accident investigations include the following:
  - A Boeing 757 overran the end of the runway while landing in Jackson Hole, Wyoming. The captain called out "deployed" even though the speedbrakes were not deployed and "two in reverse" even though the speedbrakes had fully deployed. Both the speedbrakes and the thrust reversers had mechanical defects, and the captain did not manually deploy the speedbrakes when they failed to deploy automatically because, based on his rote callout, he did not recognize that they did not deploy.[1]
  - A Hawker 800 crashed after a late go-around attempt in Owatonna, Minnesota. After touchdown, the copilot called out "we're dumped," but the flaps were not all the way in the lift dump position and the airplane did not slow down as expected, leading the pilot to attempt to go around.[2]

[1] Runway Overrun, American Airlines Flight 2253, Boeing 757-200, N668AA, Jackson Hole, Wyoming, December 29, 2010, Aircraft Accident Report NTSB/AAB-12/01 (Washington, DC: National Transportation Safety Board, 2012).
[2] Crash During Attempted Go-Around After Landing, East Coast Jets Flight 81, Hawker Beechcraft Corporation 125-800A, N818MV, Owatonna, Minnesota, July 31, 2008, Aircraft Accident Report NTSB/AAR-11/01 (Washington, DC: National Transportation Safety Board, 2011).

- Preventing Aerodynamic Stalls
- Reduced Visual References
- Is Your Aircraft Talking to You
- Risk Management for Pilots
- Risk Management for Mechanics

Available on www.NTSB.gov



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# NTSB LOC Forum Opening

**OPENING REMARKS AND ACCIDENT STATISTICS PRESENTATION (9:00 AM–9:20 AM)**

Member Earl F. Weener, Presiding

Paul Cox, Senior Air Safety Investigator, Office of Aviation Safety

# NTSB LOC Forum Panel 1

**INDUSTRY AND GOVERNMENT PERSPECTIVES AND ACTIONS (9:20 AM-10:30 AM)**

- An overview of inflight loss of control accidents in general aviation and actions taken by government and industry to decrease the accident rate.

Panelists:

- **Wendell Griffin** Director, Office of Accident Investigation & Prevention, Federal Aviation Administration
- **George Perry** Senior Vice President, Aircraft Owners and Pilots Association Air Safety Institute
- **Sean Elliott** Vice President, Advocacy and Safety, Experimental Aircraft Association
- **Ray Stanton** Manager for Risk Control Services, Old Republic Aerospace Insurance

# NTSB LOC Forum Panel 2

**HUMAN PERFORMANCE AND MEDICAL ISSUES (10:45 AM-11:55 AM)**

- Human performance and medical issues related to inflight loss of control accidents.

Panelists:

- **Christopher Wickens, PhD** Professor, Colorado State University
- **Frederic Dehais, PhD** Professor, Institut Supérieur de l'Aéronautique et de l'Espace
- **Dennis Beringer, PhD** Senior Scientist for Flight-crew Performance Research, Federal Aviation Administration CAMI Human Factors Laboratory
- **Jonathan Sackier, MD** Medical Counsel to the Aircraft Owners and Pilots Association

# NTSB LOC Forum Panel 3

**PILOT TRAINING SOLUTIONS (1:30 PM-2:40 PM)**

- This session will examine training solutions to prevent inflight loss of control accidents.

Panelists:

- **Rich Stowell** Master Aerobatic Instructor, Society of Aviation and Flight Educators
- **Thomas P. Turner** Executive Director, American Bonanza Society Air Safety Foundation
- **David Oord** Vice President Regulatory Affairs, Aircraft Owners and Pilots Association
- **Stasi Poulos** President, Mindstar Aviation

# NTSB LOC Forum Panel 4

**EQUIPMENT AND TECHNOLOGY SOLUTIONS (2:55 PM-4:05 PM)**

- This session will discuss technology solutions to prevent inflight loss of control accidents.

Panelists:

- **Earl Lawrence** Director of the Office of Unmanned Aircraft Systems Integration, Federal Aviation Administration Former Manager, Small Airplane Directorate, Federal Aviation Administration
- **James Higgins** Associate Professor, University of North Dakota
- **Jeffrey Pierson** Member, ASTM F44 Committee
- **Steve Jacobson** Senior Vice President, Product Development, Avidyne

# NTSB LOC Forum Open Discussion

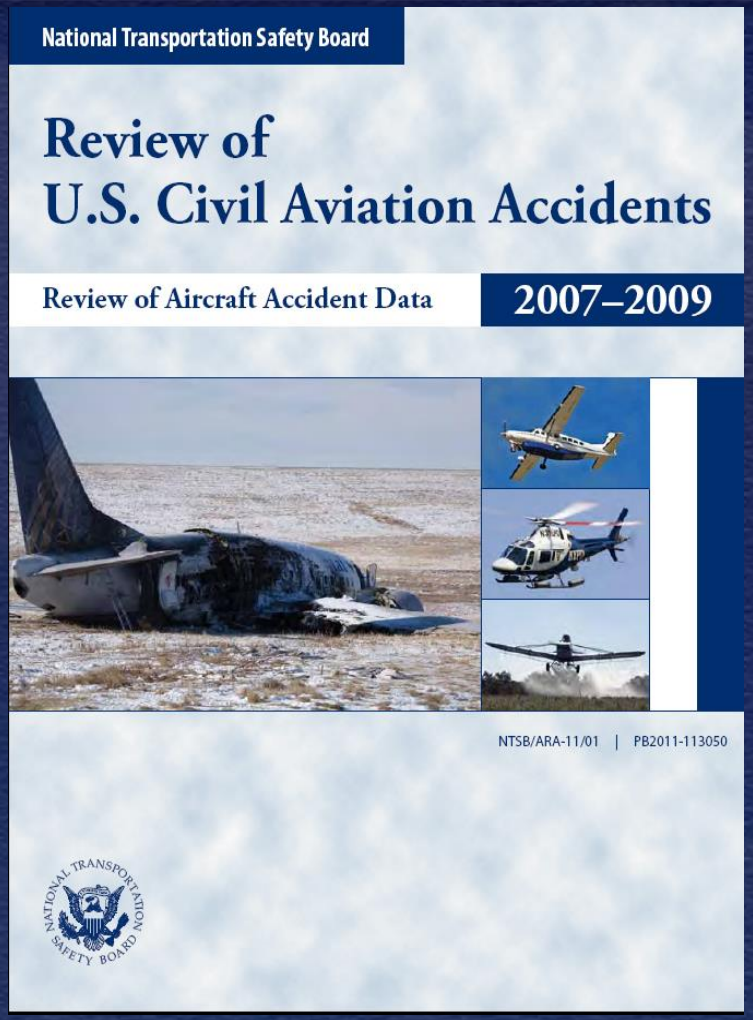
A round table discussion among

- Member Earl F. Weener,
- John DeLisi, Director, Office of Aviation Safety,
- NTSB technical panel, and
- All panelists.

# Alfred Sheinwold

"Learn all you can from the mistakes of others.  You won't have time to make them all yourself"

# Accident Investigations




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

http://www.ntsb.gov/doclib/reports/2011/ARA1101.pdf

# Douglas Adams

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