



**NTSB** National Transportation Safety Board

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# GA/Experimental Outreach Activities

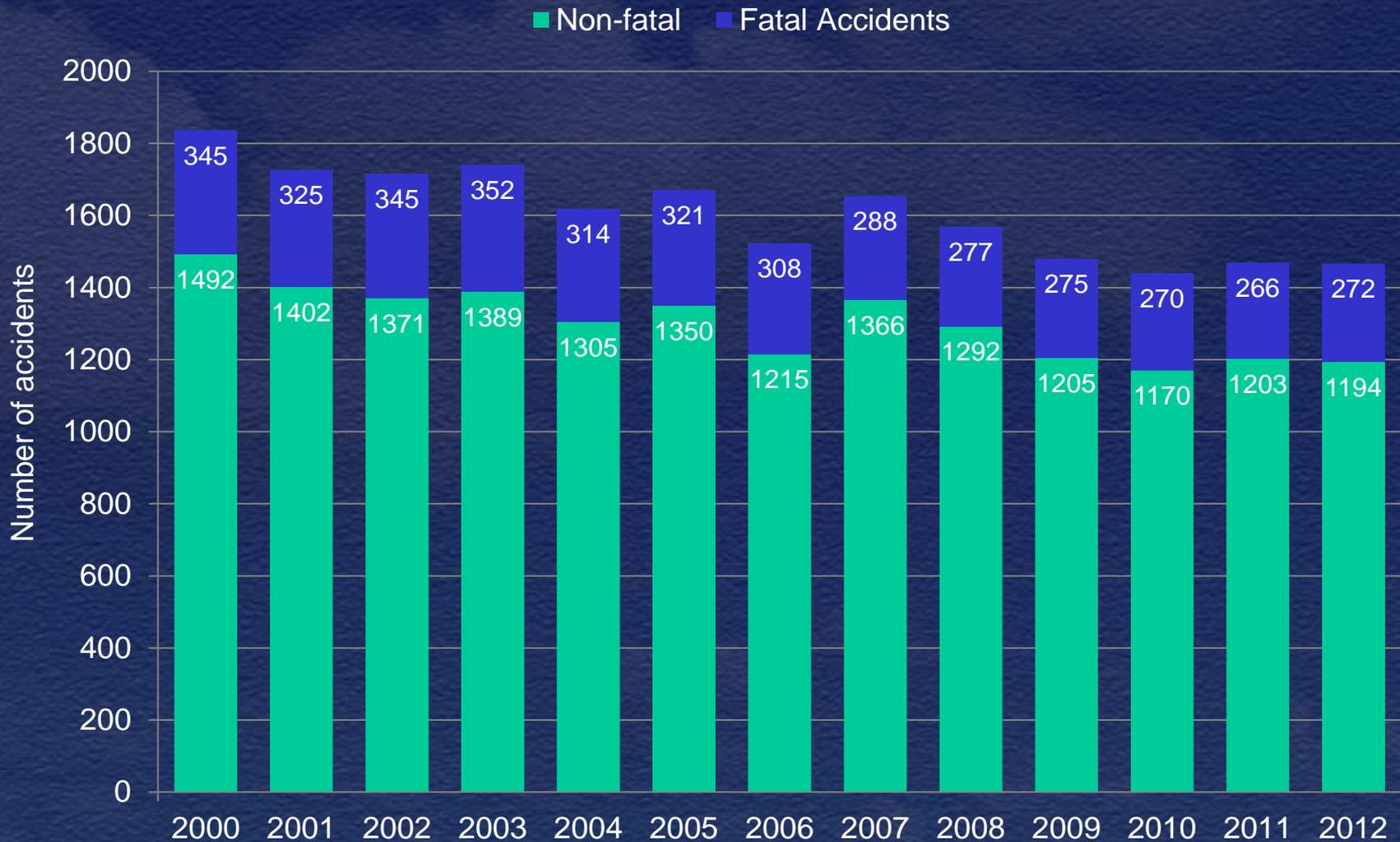
Experimental Aircraft  
Safety Seminar  
August 24, 2013

Earl F. Weener, Ph.D.  
Board Member

# N6529R - B36TC Bonanza



# All GA Accidents

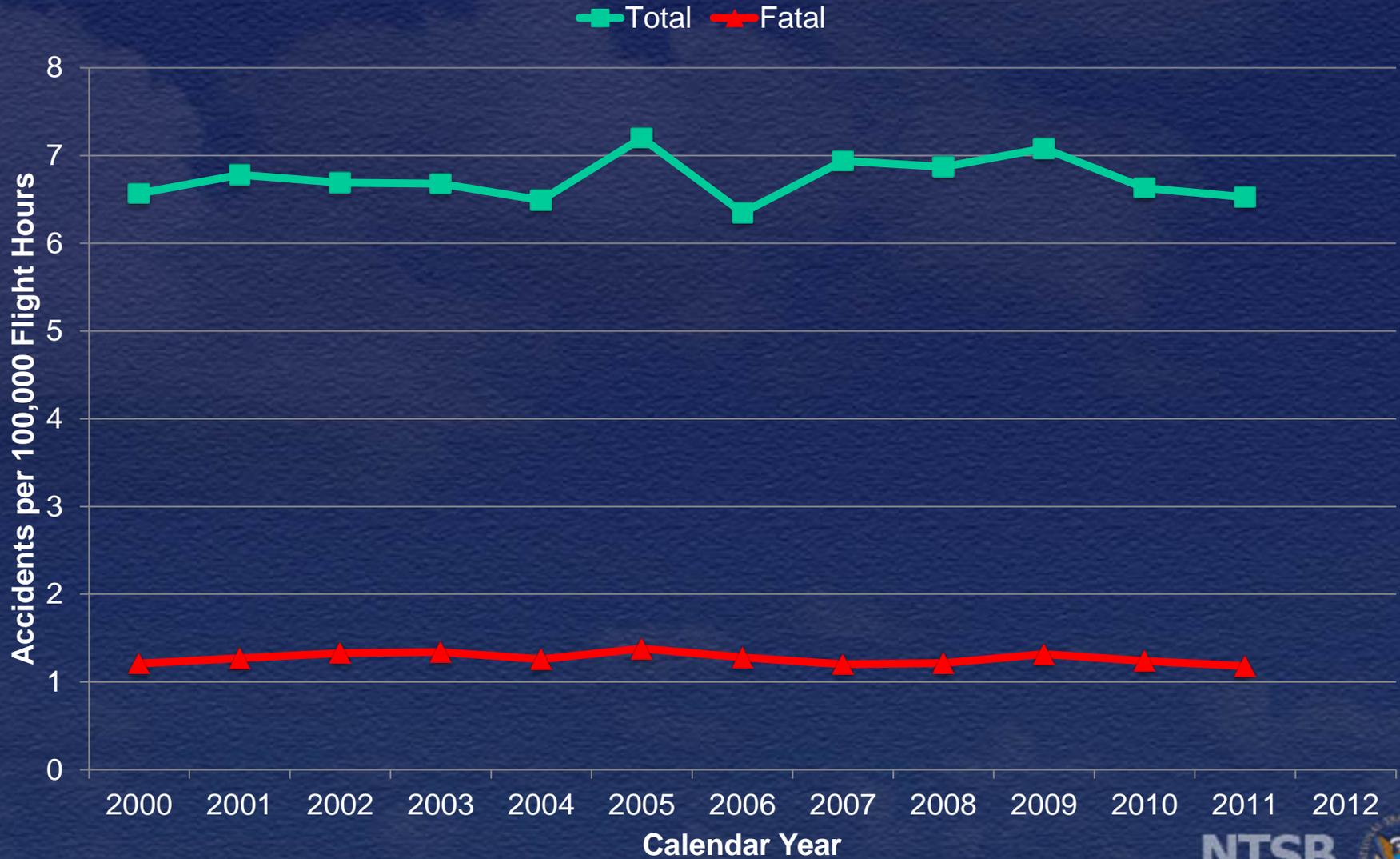


# GA Accident-involved Fatalities

GA Accident-Involved Fatalities



# GA Accident Rates

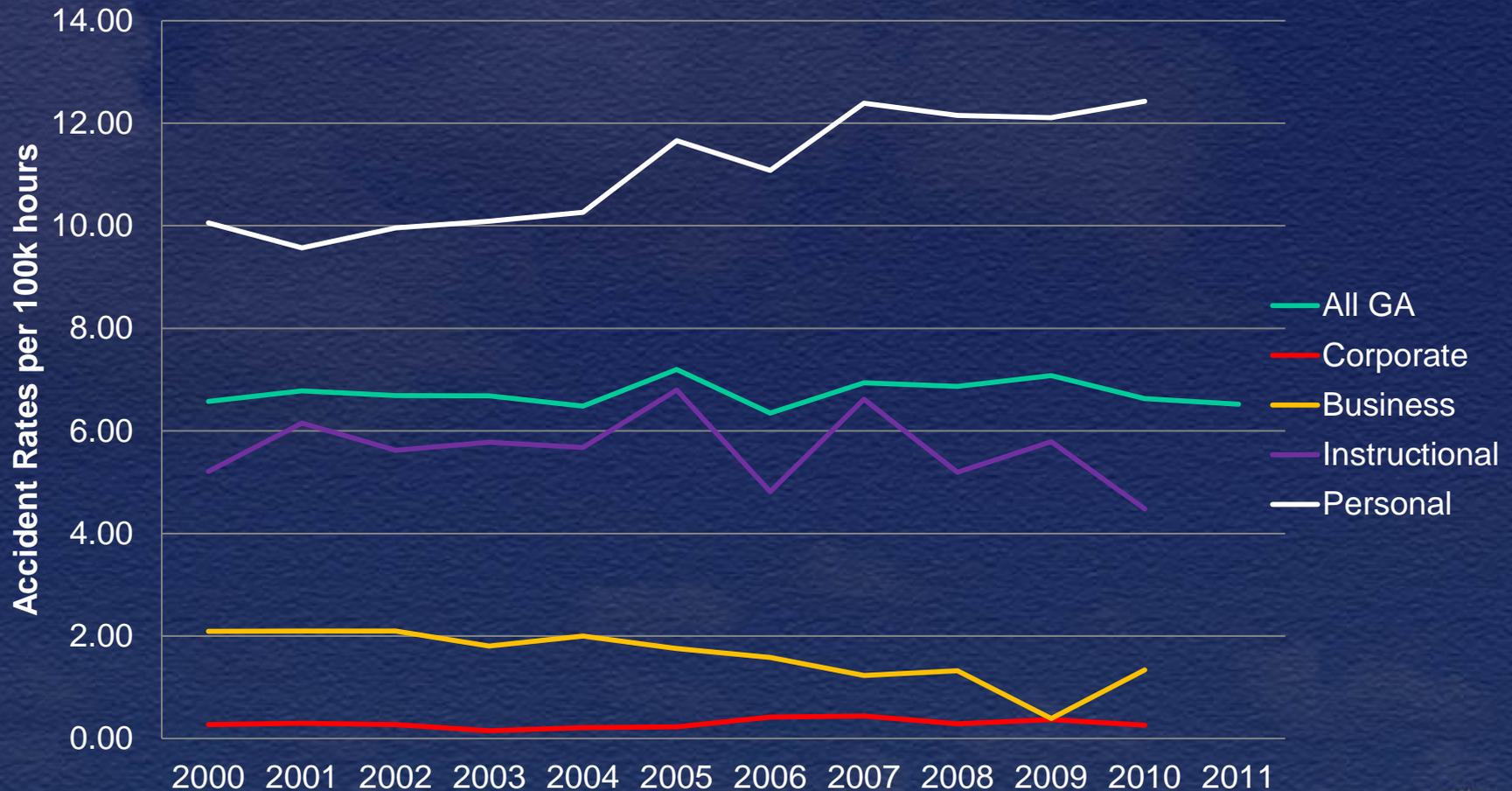


# Defining Fatal Accident Events

- Loss of Control in Flight
- System/Component Failure – Powerplant
- Controlled Flight into Terrain
- Collision with Terrain/Object (non-CFIT)
- VFR Encounter with IMC
- System/Component Failure –  
Non-Powerplant

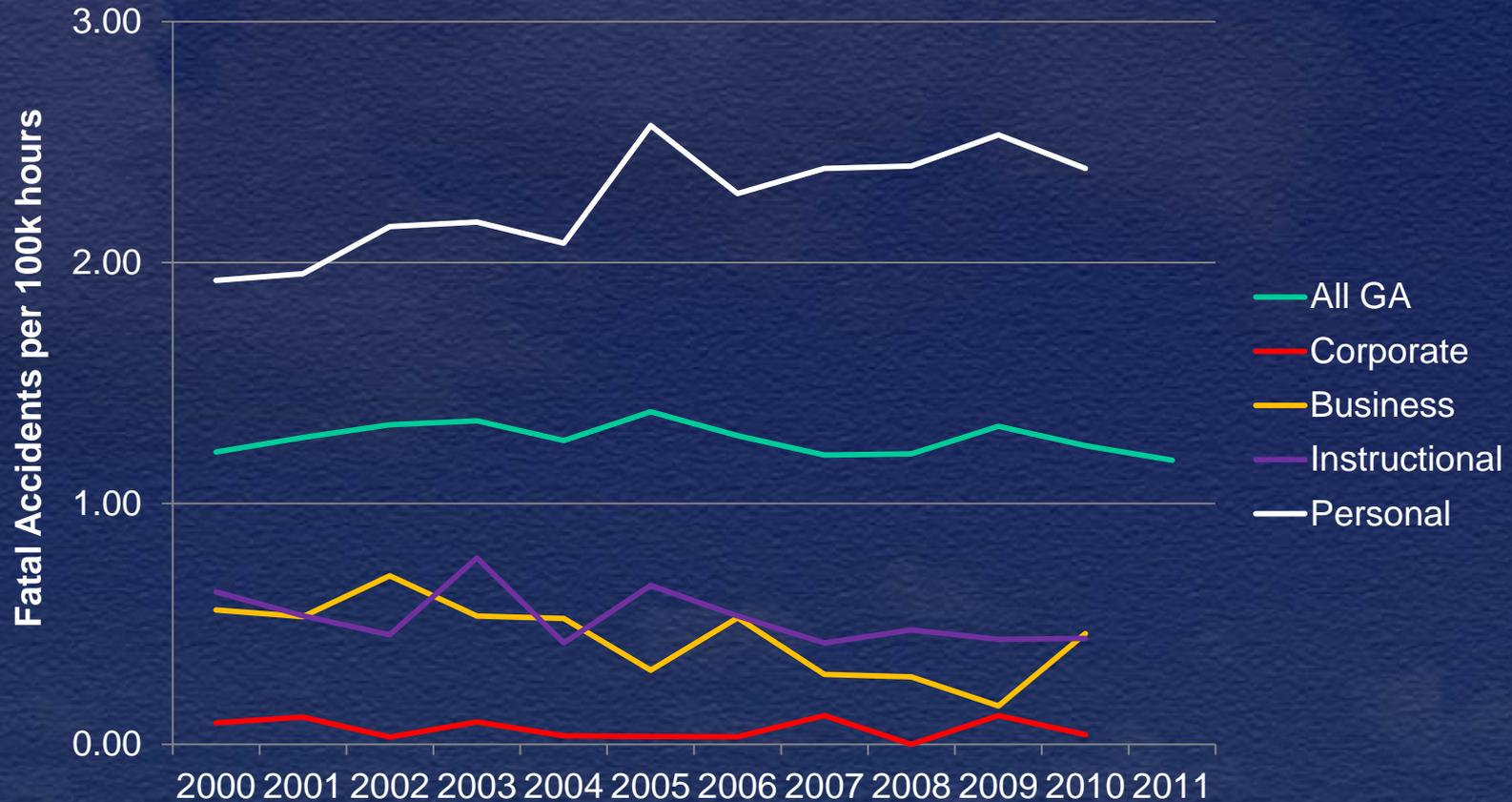
# Accident Rates per 100k Flight Hours

Accident Rates per 100k Flight Hours  
2000-2011

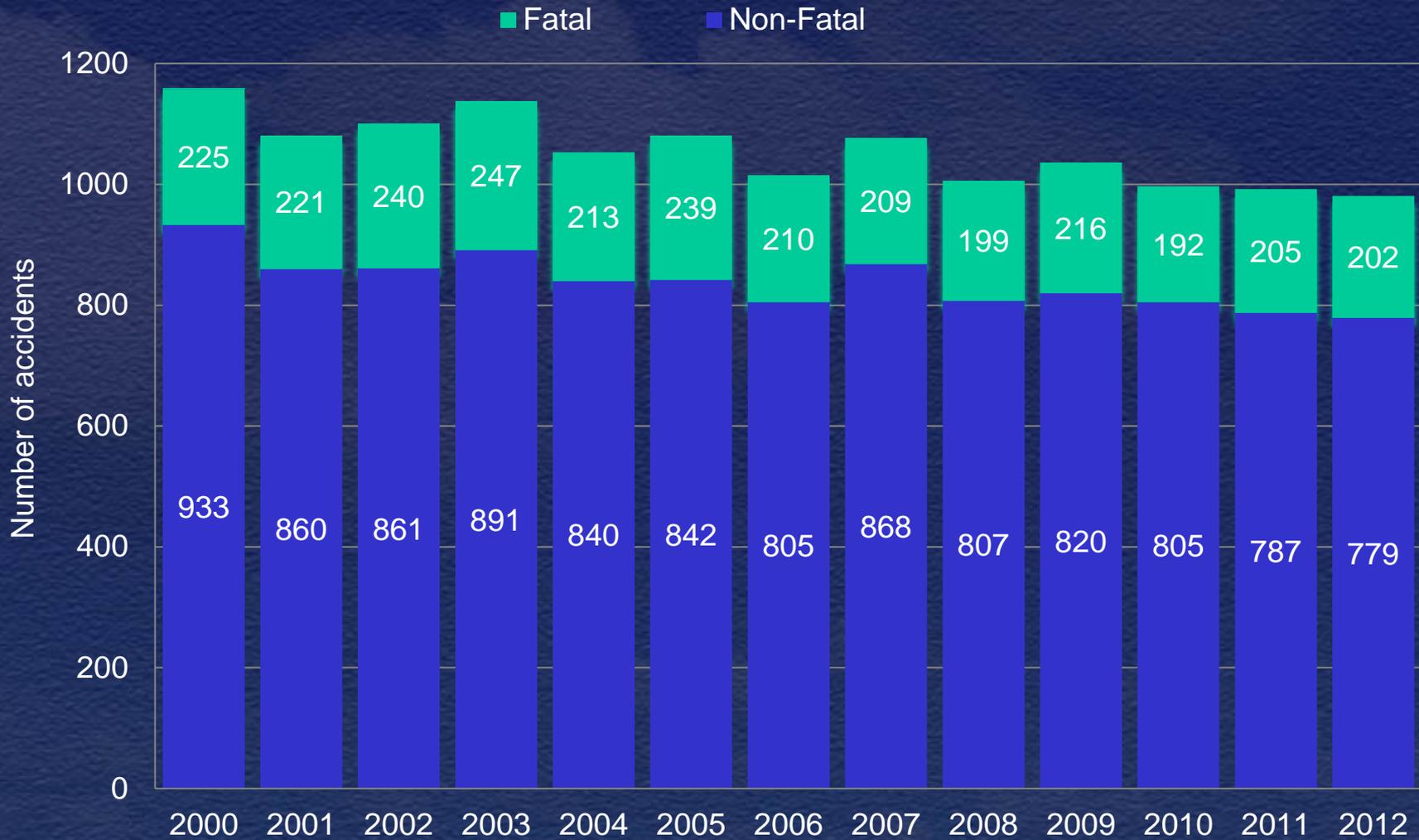


# Fatal Accident Rates per 100k Flight Hours

Fatal Accident Rates per 100k Flight Hours  
2000-2011



# Personal Flying Accidents



# Personal Flying, 2008-2012

Total accidents - loss of control in flight and on the ground and power plant failure were the most common defining events.

Loss of control in flight accounted for the greatest proportion of the personal flying accidents.

## Number of Personal Flying Accidents

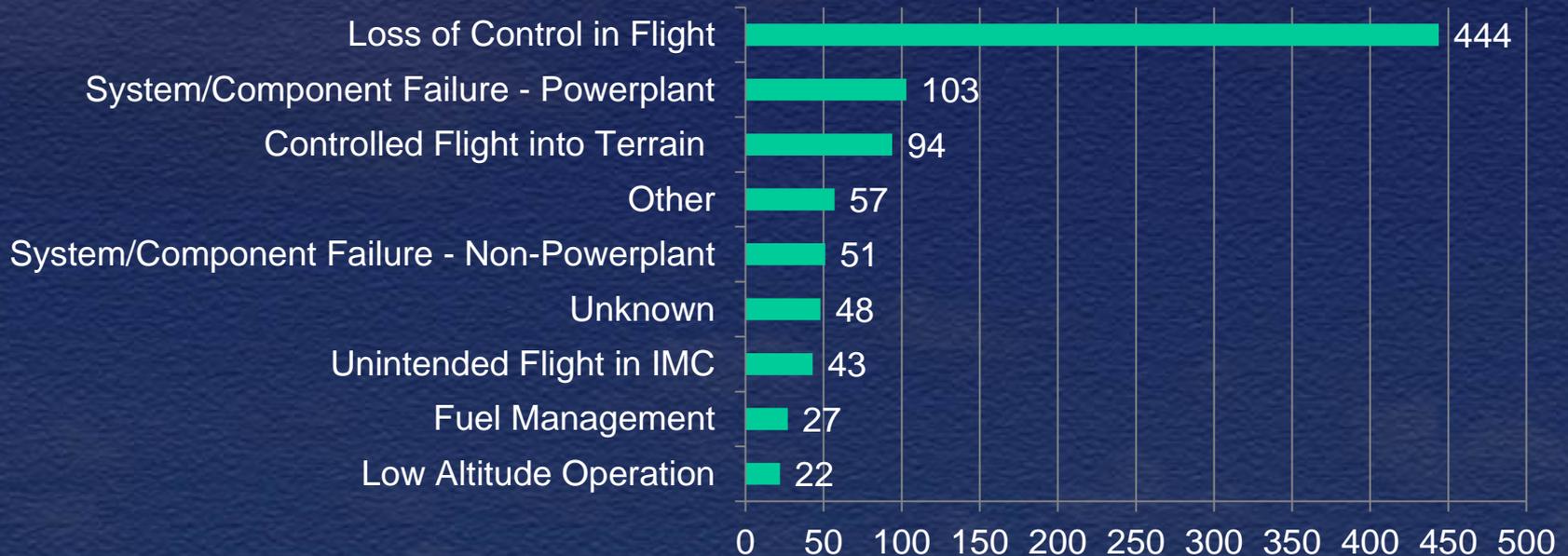


# Personal Flying, 2008-2012

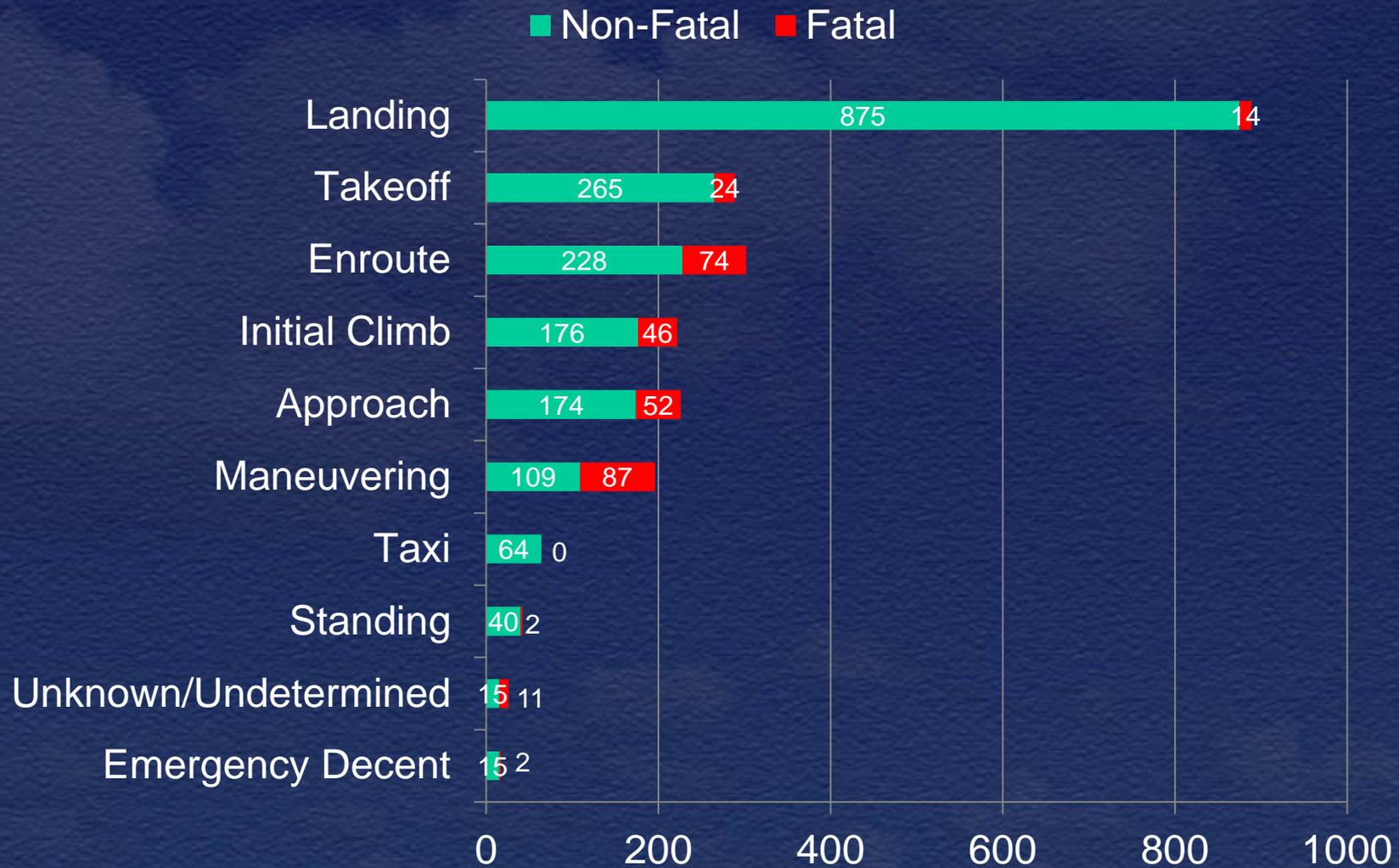
Total accidents - loss of control in flight and on the ground and power plant failure were the most common defining events.

Loss of control in flight accounted for the greatest proportion of the fatal personal flying accidents.

## Number of Fatal Accidents

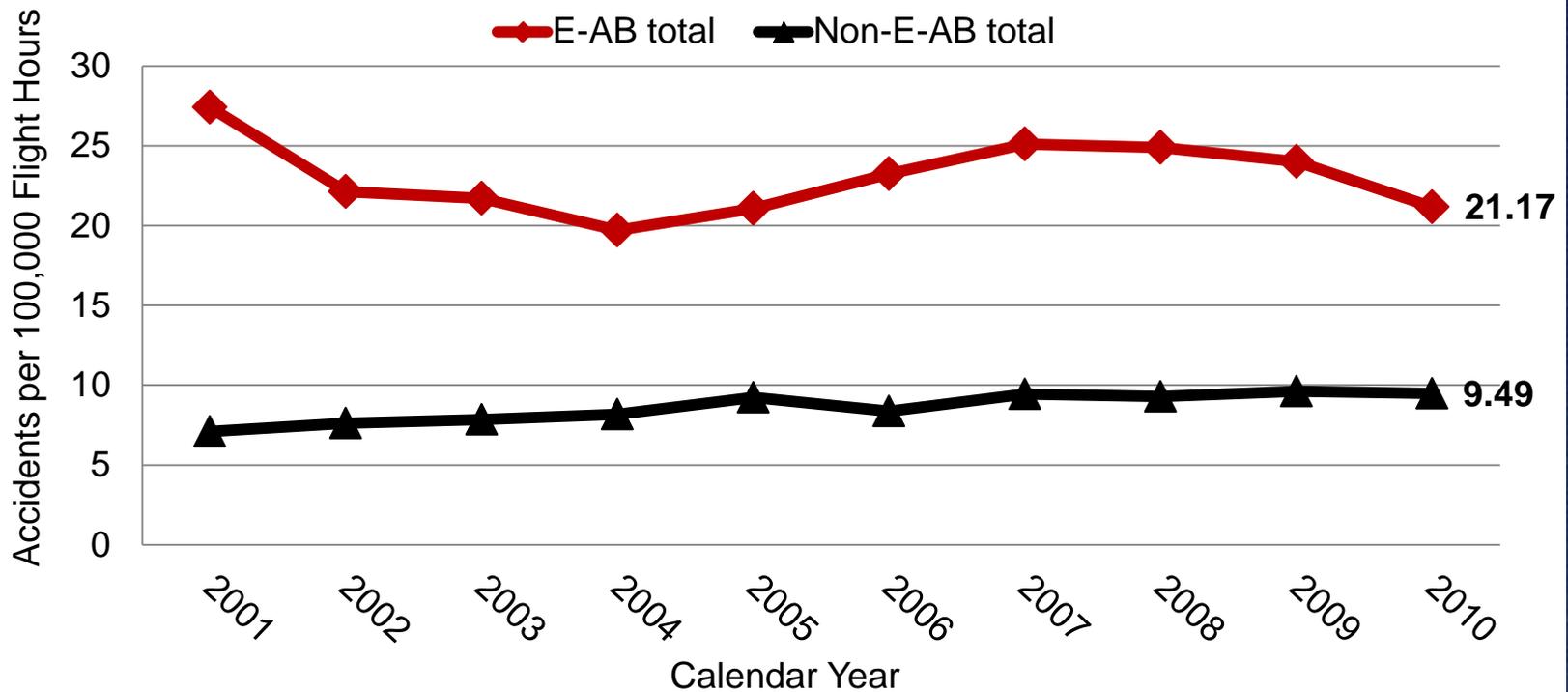


# Phase of Flight for Personal Flying – 2010-2012



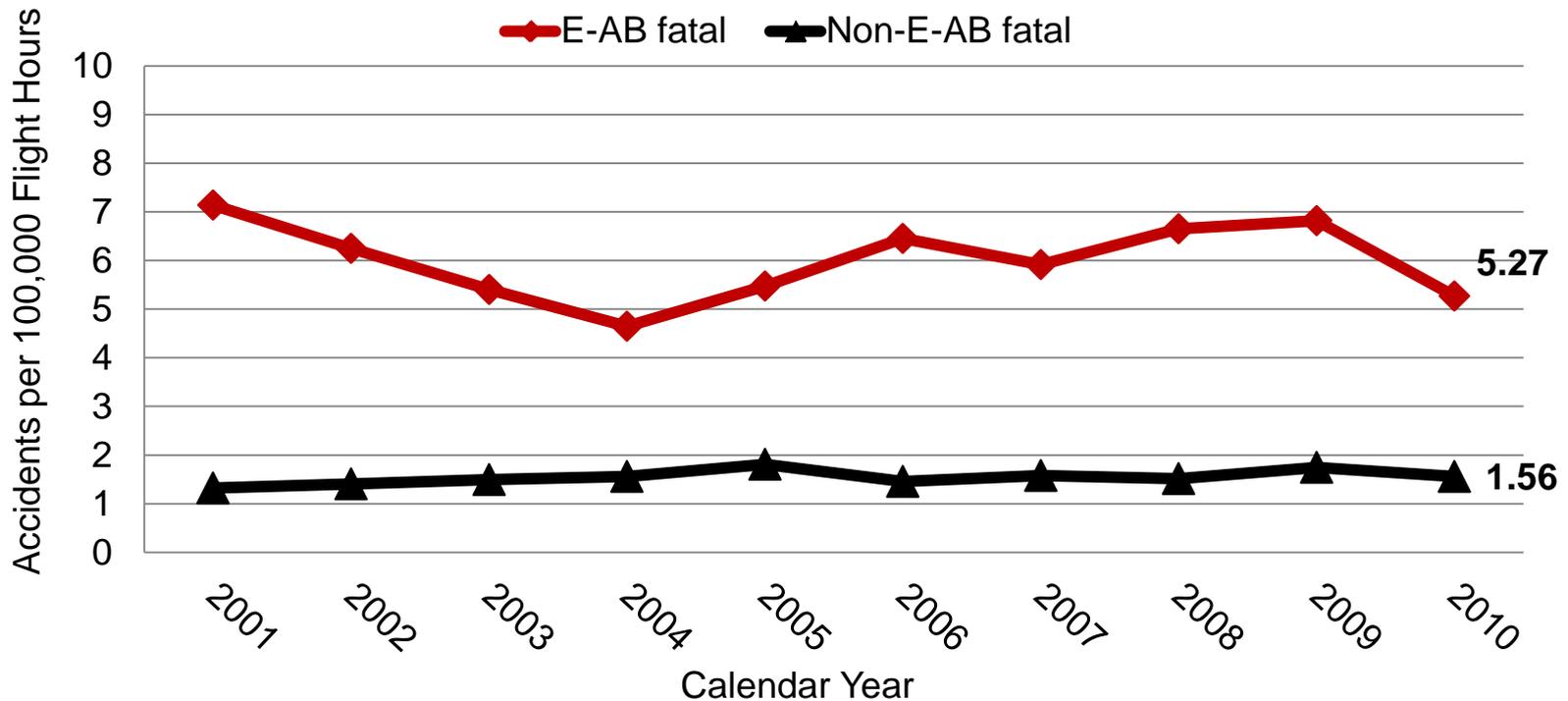
# Accident rates of E-AB aircraft

## Accident Rate per 100,000 Flight Hours, 2001-2010



# Accident rates of E-AB aircraft

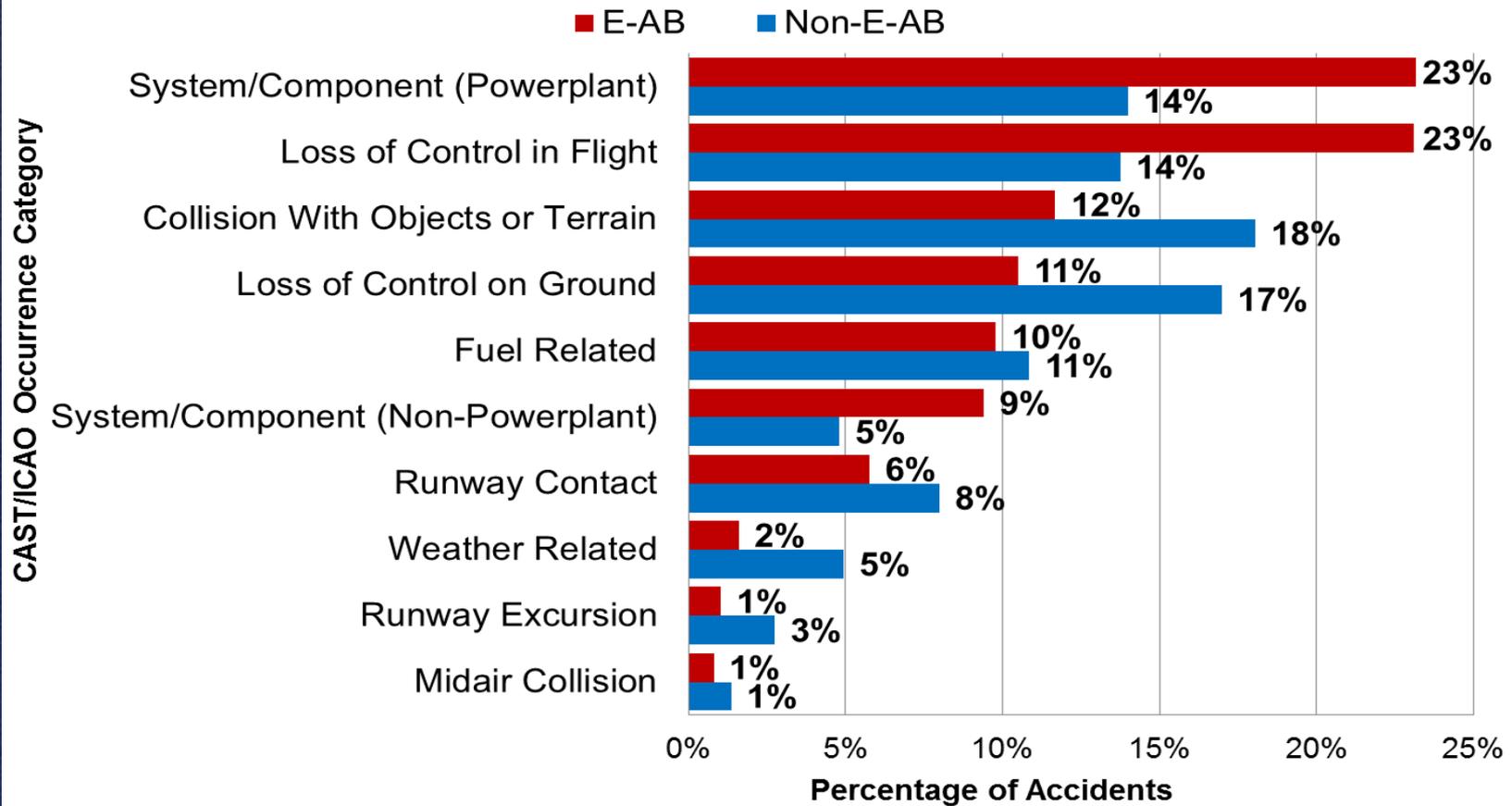
## Fatal Accident Rates per 100,000 Flight Hours, 2001-2010



# E-AB Aircraft Accidents, 2008-2012



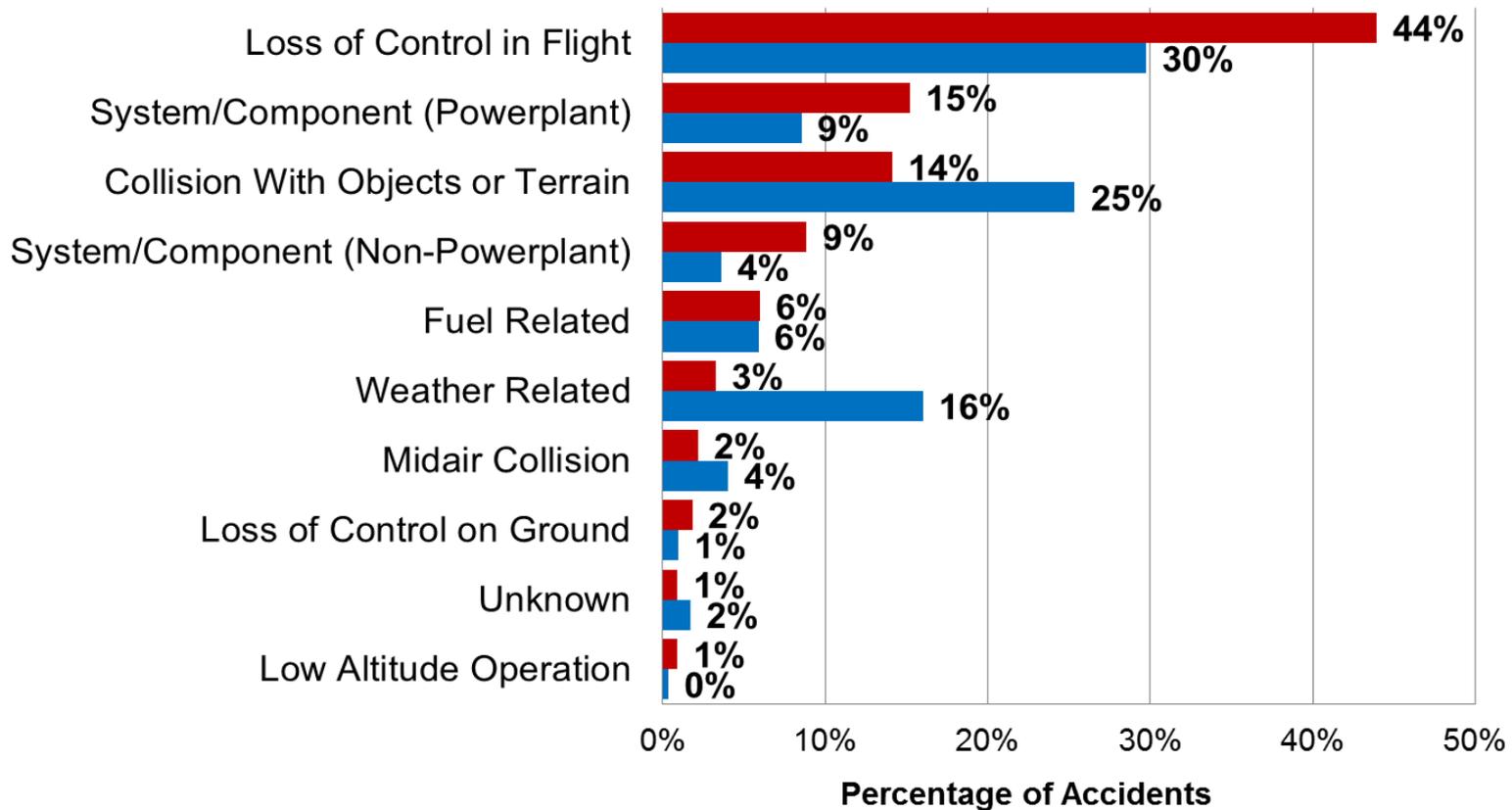
# Top 10 Accident Occurrence Categories, 2001–2010



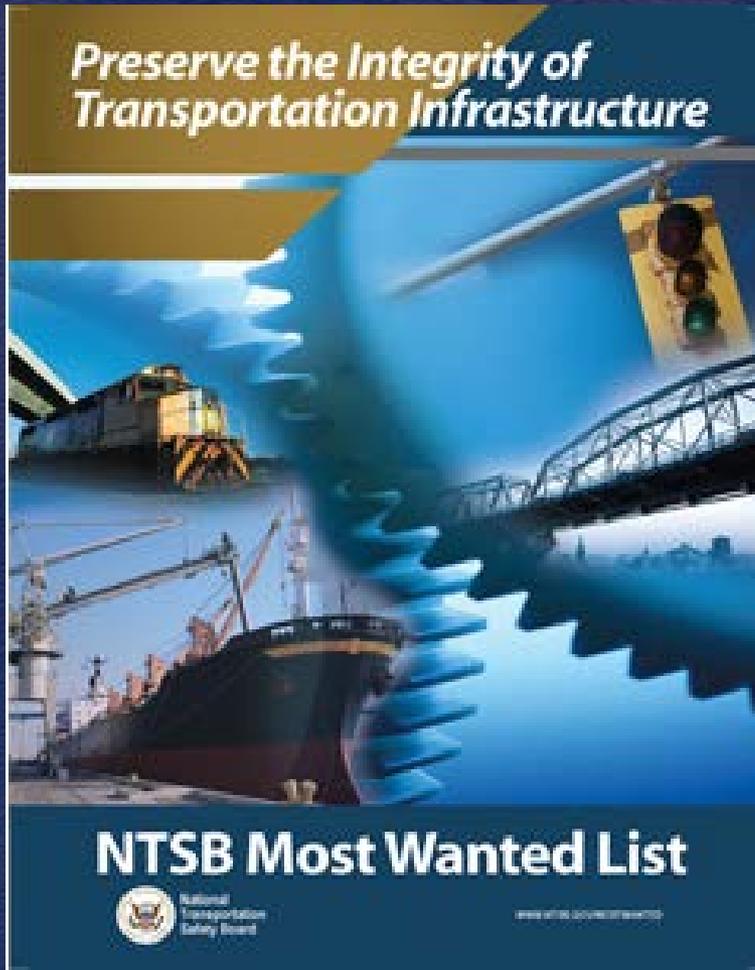
# Top 10 Fatal Accident Occurrence Categories, 2001–2010

■ E-AB ■ Non-E-AB

CAST/ICAO Occurrence Category



# NTSB Most Wanted List



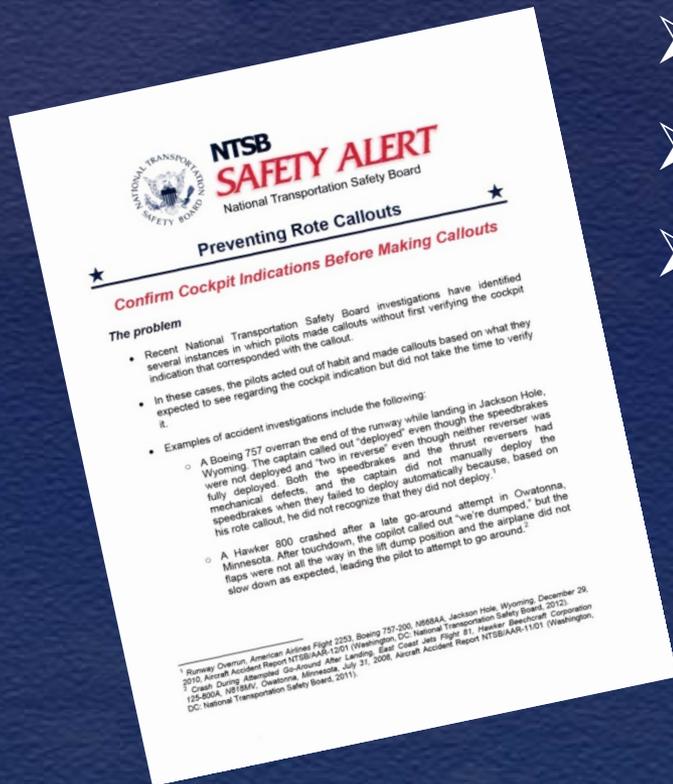
- Improve general aviation safety
- Improve safety of airport surface operations
- Eliminate distraction in transportation
- Preserve the integrity of transportation infrastructure
- Improve fire safety in transportation
- Enhance pipeline safety
- Implement positive train control systems
- Improve the safety of bus operations
- Eliminate substance-impaired driving
- Mandate motor vehicle collision avoidance technologies

# Reduced Visual References

- What you can do –
  - Get a preflight weather briefing and plan for contingencies
  - Resist external pressures
  - Honestly assess your skills
  - Know your equipment
  - Seek help from Air Traffic Control
  - Don't underestimate the challenges of night flying
  - Manage distractions

# NTSB Safety Alerts

- 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](http://www.NTSB.gov)



# Alfred Sheinwold

“Learn all you can from the mistakes of others. You won’t have time to make them all yourself”

# Loss of Control in Flight



# Loss of Control In-flight

- Accident #LAX08FA300
- Beechcraft A36
- Approach to KCRQ Runway 24, Carlsbad CA airport, 331 ft msl
- One person onboard, fatal
- Weather – 100 ft ceiling,  $\frac{1}{4}$  mi visibility, wind 280 degrees at 5 kt
- ILS 24 minimums 200 ft ceiling,  $\frac{3}{4}$  mi visibility

# Loss of Control In-flight

- Pilot
  - Private certificate
  - Instrument rating 2 months prior
  - Nine hundred hours total time
  - No instrument training in accident aircraft
- Aircraft
  - No apparent malfunctions
  - Adequate fuel

# Loss of Control In-flight

- Accident sequence
  - ATC cleared for ILS approach RW 24
  - Tower issued “low altitude alert” and advised pilot he was south of localizer
  - Two minutes later pilot stated he was “aborting” the approach
  - One minute later pilot stated “I’m in trouble”

# Loss of Control In-flight

- Radar tracks
  - Two miles from approach end RW24 airplane crossed LOC at 800 ft heading south
  - Track started tight left-hand turns
  - Altitude fluctuated between 600 and 1100 ft msl
  - Last radar return showed airplane at 900 ft msl and 56 kt ground speed
- Wreckage confined to initial impact area

# Loss of Control In-flight

## Probable Cause

The pilot's failure to maintain control during the instrument approach and attempted go-around

# Controlled Flight into Terrain



# Controlled Flight into Terrain

- Accident NYC08FA138
- Cirrus SR22
- Night IFR Departure Front Royal Virginia, KFRR, 709 ft msl
- Two fatalities – pilot & son
- Weather – Winchester, KOKV, 15 mi S
  - Wind 340 deg at 4 kt
  - 3 mi visibility in rain
  - Broken 2,400 ft, overcast 3,000 ft

# Controlled Flight into Terrain

- Pilot
  - Private Certificate, Instrument rating
  - Estimated total time – 193 hours
- Aircraft
  - Airplane total time less than 300 hrs
  - No apparent malfunctions
  - Flight data extracted from PFD system

# Controlled Flight into Terrain

- Accident sequence
  - IFR clearance – direct COGAN intersection, climb and maintain 4,000, expect 5,000 ft, 10 minutes after departure
  - Prior to takeoff, Desired Course set to 050 deg, approximate direct course to COGAN
  - Airplane departed RW27
  - GPS waypoint COGAN selected during takeoff roll
  - Aircraft path continued west, consistent with GPSS not selected

# Controlled Flight into Terrain

- Flight path
  - Total time of flight 80 seconds
  - First 40 sec, runway heading, climbing 900 to 1,000 fpm
  - 25 sec, vertical speed decreased to 0 fpm,
  - then up 2200 fpm,
  - then decreased to 700 – 750 fpm up
  - Airplane reached 2,200 ft msl and 140 kt ias
  - Last 6 sec, steep descending turn to left, roll to 95 deg and pitch to 27 deg down

# Controlled Flight into Terrain

## Probable Cause

The pilot's failure to maintain clearance from rising mountainous terrain, and his failure to turn toward his assigned course during initial climb. Contributing to the accident were the low ceiling, reduced visibility, dark night conditions and rising mountainous terrain

# Summary

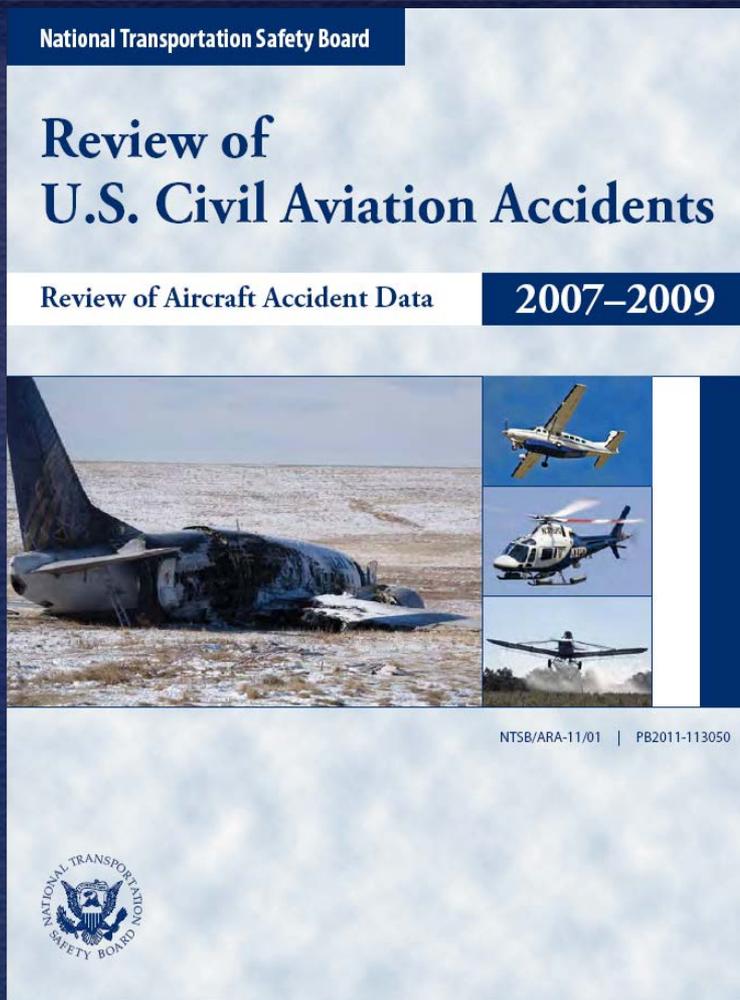
- Pilot proficiency
  - Launch into hard IMC with new instrument rating and no instrument instruction in airplane
  - System operational confusion on IFR departure

# Summary

- Preparation & planning
  - Launch into weather with destination forecast to be below minimums
- Decision making
  - Numerous points where a different decision would have lead to a different outcome



# You can try this at home



- NTSB accident files are on-line
- Many recent accident Dockets are on-line
  - Factual reports,
  - Interviews
  - Photographs
- [www.nts.gov](http://www.nts.gov)

<http://www.nts.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.”

# A Personal Decision

The equipment we fly is capable of much greater safety than many pilots achieve.

At what accident rate do you want to operate by yourself or with family and friends; down with the Corporate and Business operators or at the Personal level?

**It's your choice!**





**NTSB**