NTSB National Transportation Safety Board

Business Aviation Status and Challenges

Single Pilot Safety Stand-down

Earl F. Weener
Member, NTSB

NBAA Annual Meeting & Convention, Las Vegas
October 2013

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.

NTSB "Air Force"

- Built/Restored or Building/Restoring*
- **Sheryl Chappell:** Cessna 180 Floatplane
- **John Clark (EAA #603773):** Schreder RS-15, Vans RV-9A, Vans RV-12
- **Paul Cox:** Beech Bonanza G33, Vans RV-8a (Building)
- **Dennis Crider (EAA #1041658):** Vans RV-12
- **Dennis Diaz (EAA #1047382):** Vans RV-7a
- **Craig Hatch (EAA #659495):** Vans RV-8a, Cessna 140
- **Tom Haueter (EAA #251921):** 1943 Stearman, 1934 Lockheed Altair
- **Tim LeBaron (EAA #454270):** Piper J-3, Breezy (experimental), Pober Jr. Ace, 1941 Piper J5A, 1946 Cessna 120, 1975 Cessna 150, 1946 Ercoupe, Vans RV-4, 1947 Piper PA-11 Cub Special
- **Larry Lewis (EAA #751909):** Varga Kachina 2150A, Vans RV-8
- **Ron Price:** 1972 McCollough J2, Long EZ
- **Eliott Simpson:** Vans RV-7, Pietenpol Aircamper
- **Bob Swaim (EAA #221919):** 1974 Beech Sport, 1947 Cessna 140, 1967 Cessna 150, 1941 Stinson 10A, Kitfox
- * At least one airplane listed was built/restored or is in the process of being built/restored.

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NTSB "Air Force"

- Own (Not Built/Restored)
- **Member Earl Weener (EAA #727429):** Beech Bonanza B36TC
- **Kurt Anderson:** Navion, Aeronca 11AC, Cessna 170A
- **Tim Burtch (EAA #1078661):** Cessna 172
- **John Brannen:** Sonerai IIL
- **Evan Byrne:** Cessna 172
- **Jill Demko:** PA-22-108 Piper Colt
- **J. Michael Duncan:** Beech Bonanza V35B
- **Kristi Dunks (EAA #689578):** 1955 Piper Super Cub
- **Catherine Gagne (EAA #646357):** 1956 Beech Bonanza G35
- **Craig Hatch:** Cessna 170a
- **Mike Huhn:** Cessna 182
- **Judge William Mullins:** Vans RV-8a
- **Jose Obregon:** Cessna 172
- **Jim Ritter:** Piper Comanche
- **Chris Stephens (EAA #689593):** Piper Comanche

N6529R - B36TC Bonanza

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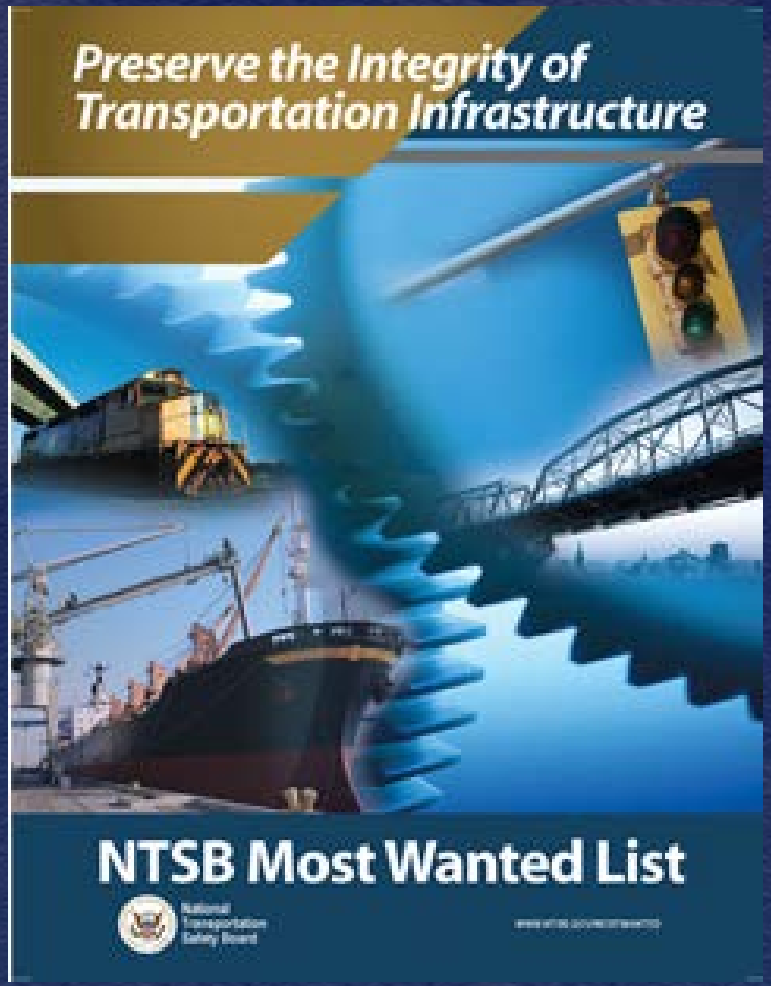
NTSB Most Wanted List



- 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

Why GA on the Most Wanted List?

- NTSB investigates approximately 1500 GA accidents per year
- Overall GA accident rate flat
  - Has not improved over the last ten years
  - Air carrier accident rate decreased almost 80%
- Personal flying accident rate
  - Increased 20% over last 10 years
  - Fatal rate increased 25% over that period

- ***GA safety needs attention***

General Aviation Safety

Climbing to the Next Level

June 19-20, 2012

Safety Forum Agenda

- **Panel 1 – Safety Priorities**
  - NASA, GA-JSC, FAA
- **Panel 2 – Safety Programs**
  - ABS, AVEMCO Insurance, AOPA, FAA (Wings Program)
- **Panel 3 – Role of the Flight Instructor**
  - SAFE, NAFI, FAA, UND, IAFTP
- **Panel 4 – Content, Quality & Consistency of Pilot Training**
  - FAA, ASA, Red Bird Simulators, SAFE, ERAU

Safety Forum Agenda (cont'd)

- **Panel 5 – Weather Related Decision-Making**
  - FAA, Baron Services, ERAU, CAMI, Independent Aviation Safety Speaker, FAA
- **Panel 6 – Aircraft Maintenance and Modification**
  - FAA, EAA/VAA, Middle TSU, PAMA
- **Panel 7 – New Aircraft Design and Certification**
  - FAA, GAMA, Cirrus, AOPA, ICON Aircraft
- **Panel 8 – Advanced Avionics and Handhelds**
  - GAMA, AOPA, NASA, ERAU

NTSB Safety Alerts

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

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SAFETY ALERT
National Transportation Safety Board

Preventing Rote Callouts

Confirm Cockpit Indications Before Making Callouts

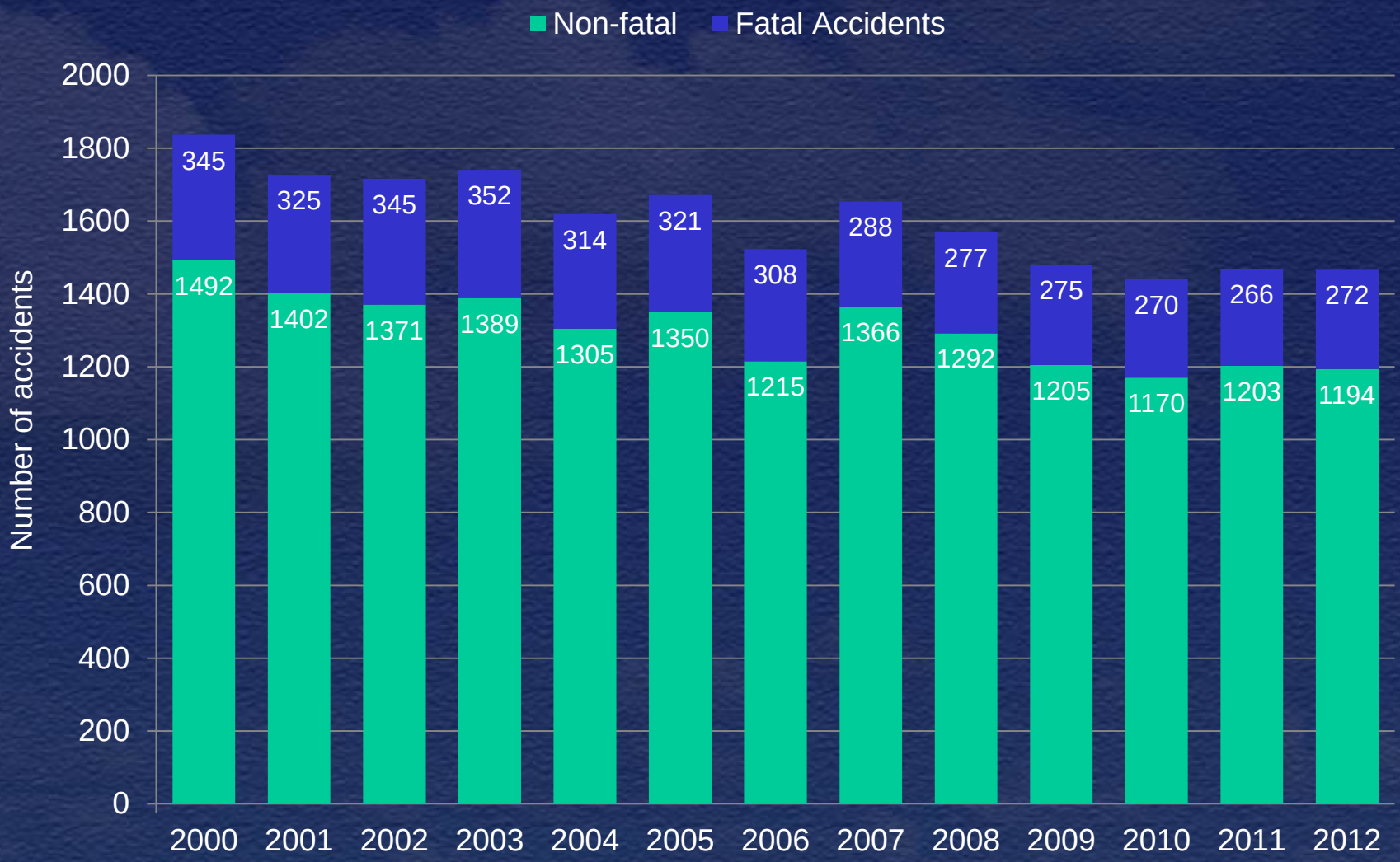
The problem

- 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 thrust reversers was fully deployed. Both the speedbrakes and the neither reverser 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).

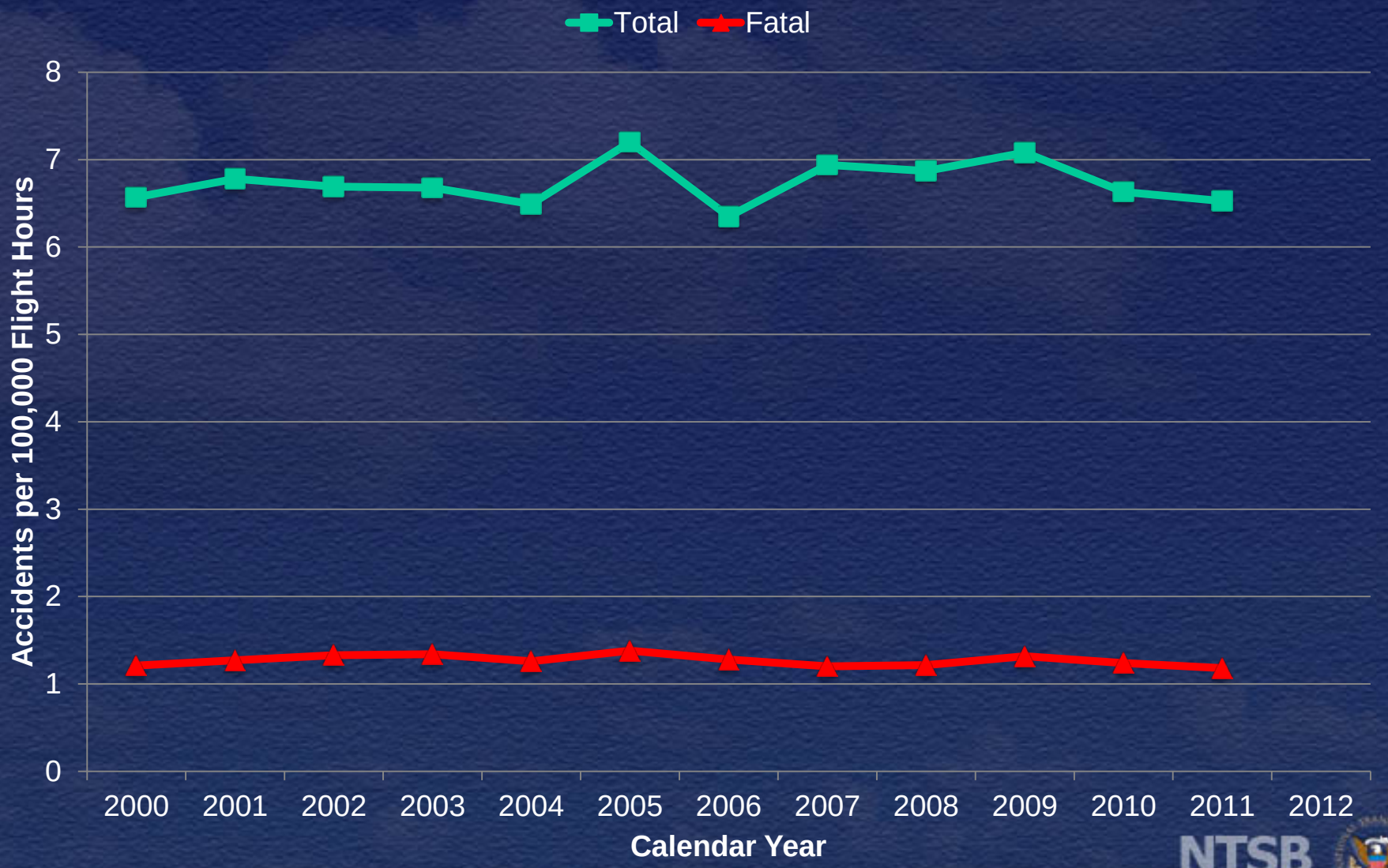
Available on www.NTSB.gov

All GA Accidents



GA Accident-involved Fatalities

GA Accident Rates



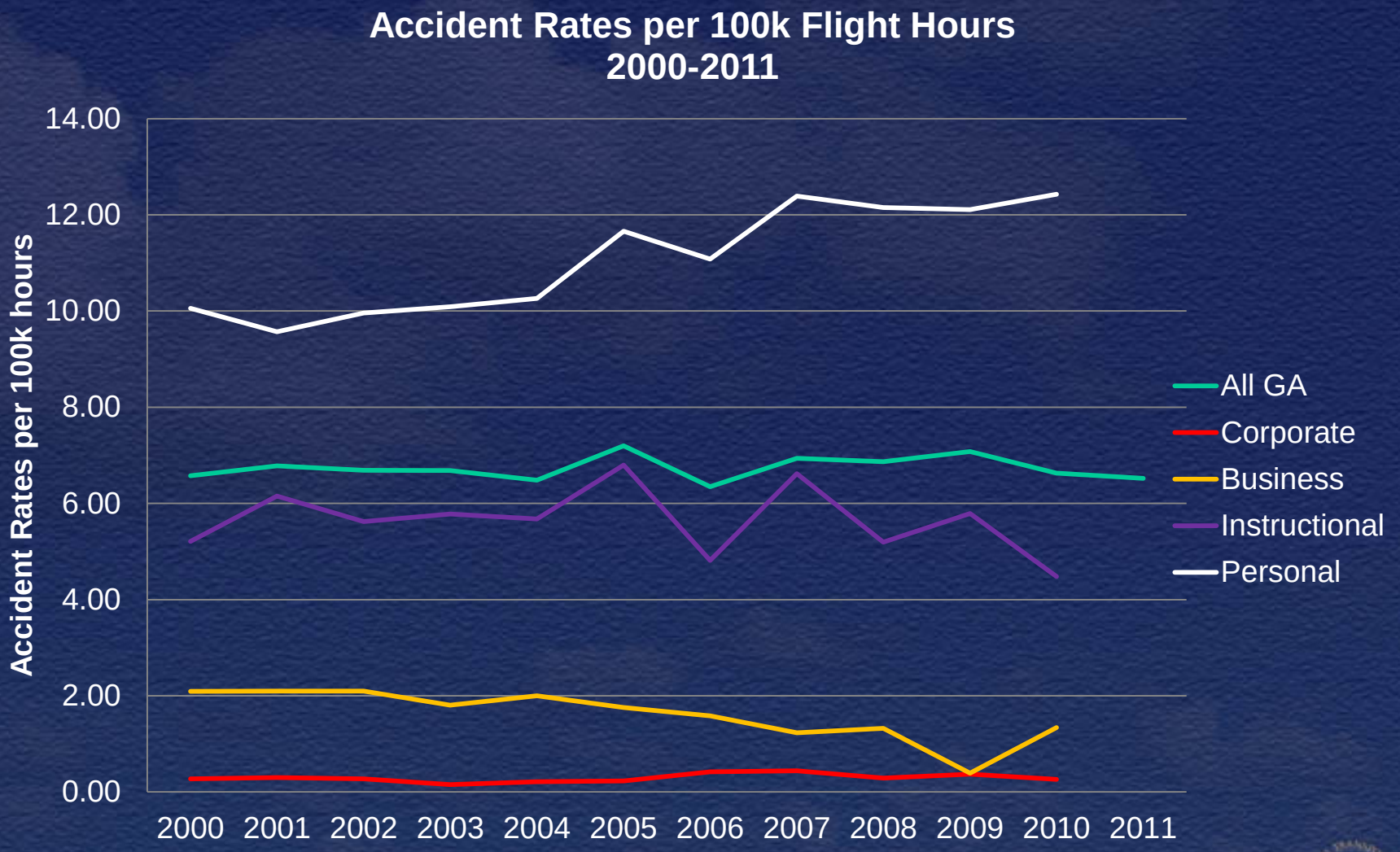
Defining Fatal Accident Events All GA 2008-2012

- 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

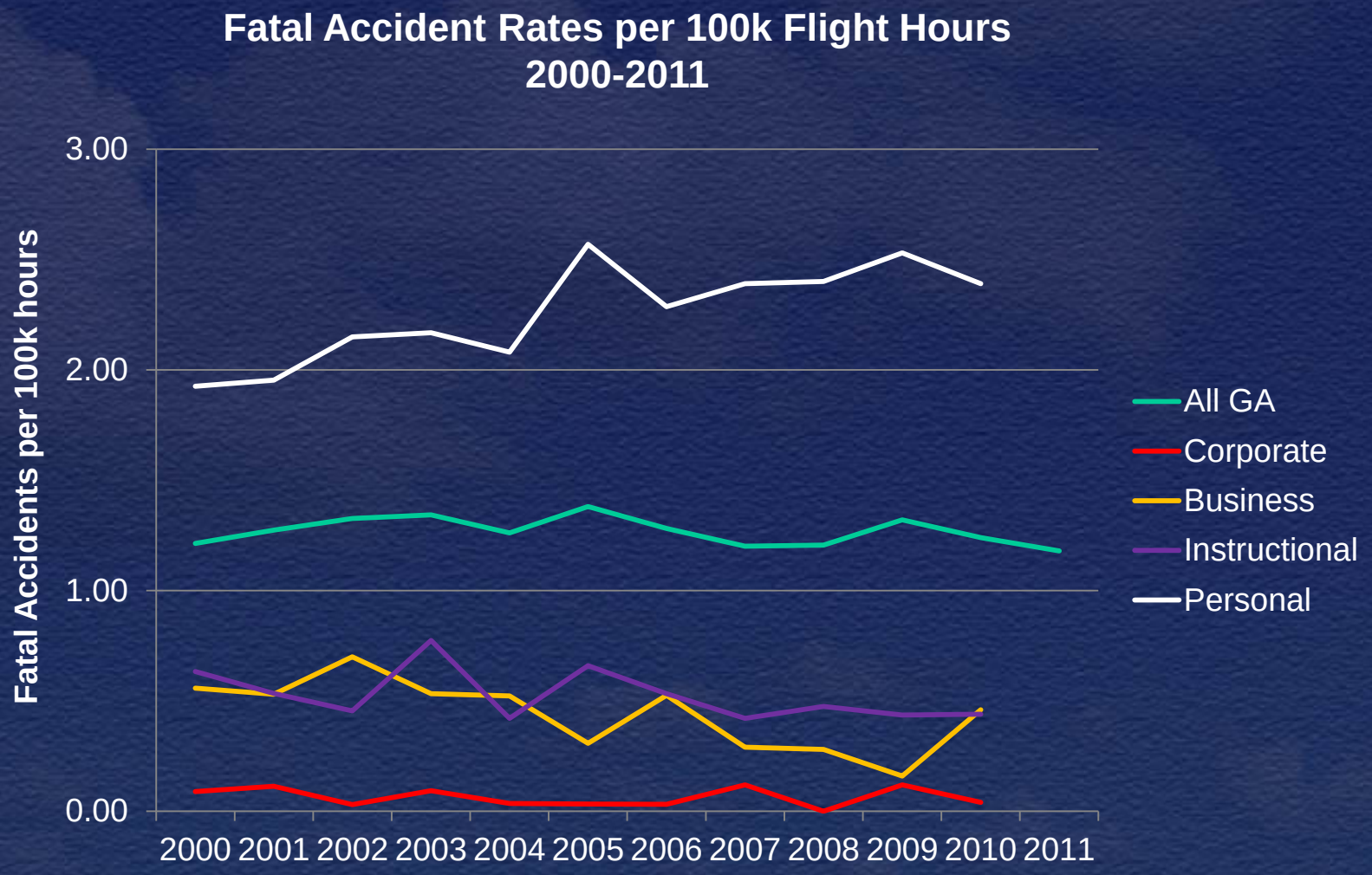
Defining Fatal Accident Events, All GA, 2007 - 2011

- Loss of Control in Flight
- System/Component Failure – Powerplant
- Controlled Flight into Terrain
- Collision with Terrain/Object – Non-CFIT
- System/Component Failure – Non Powerplant

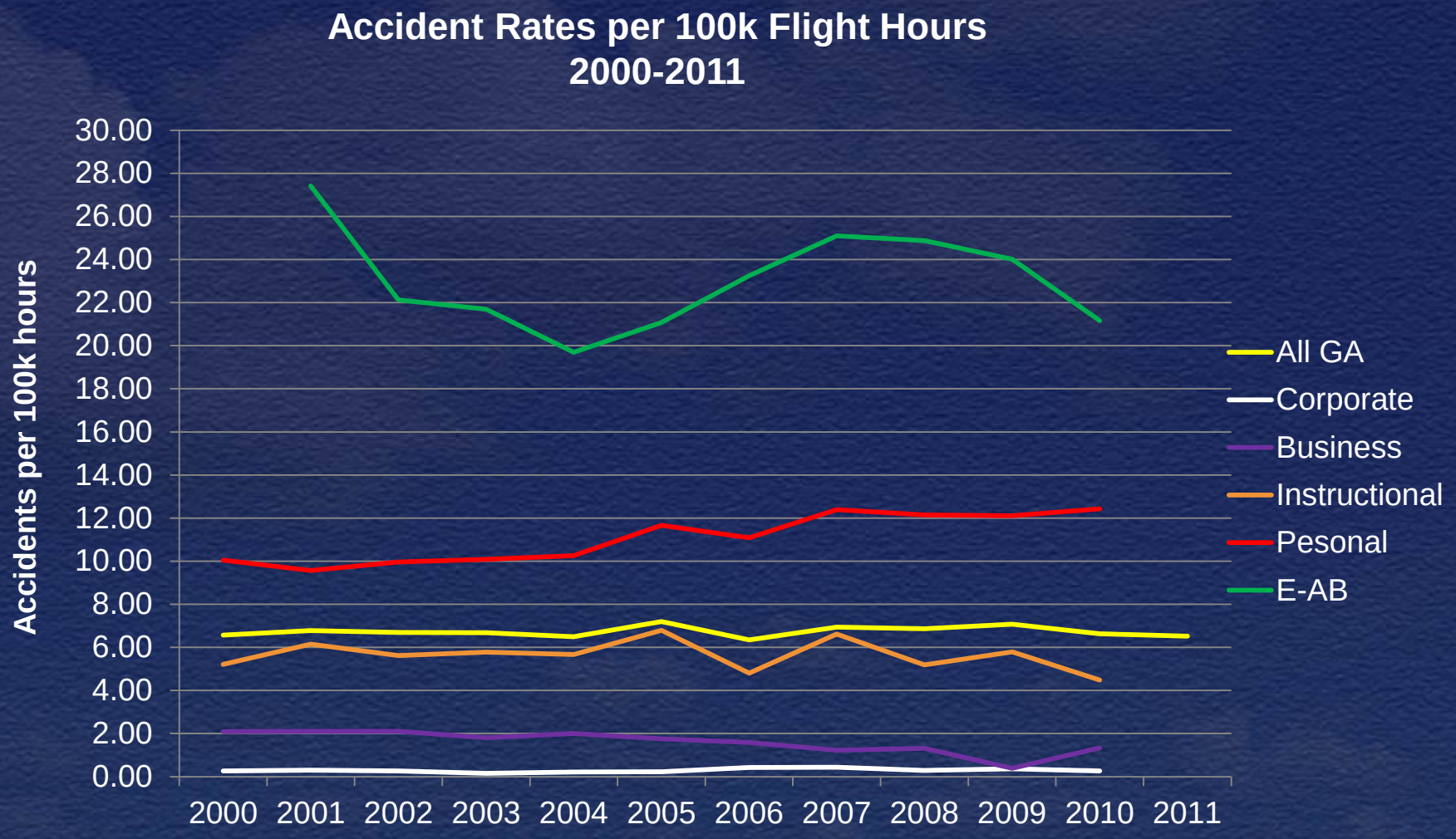
Accident Rates per 100k Flight Hours



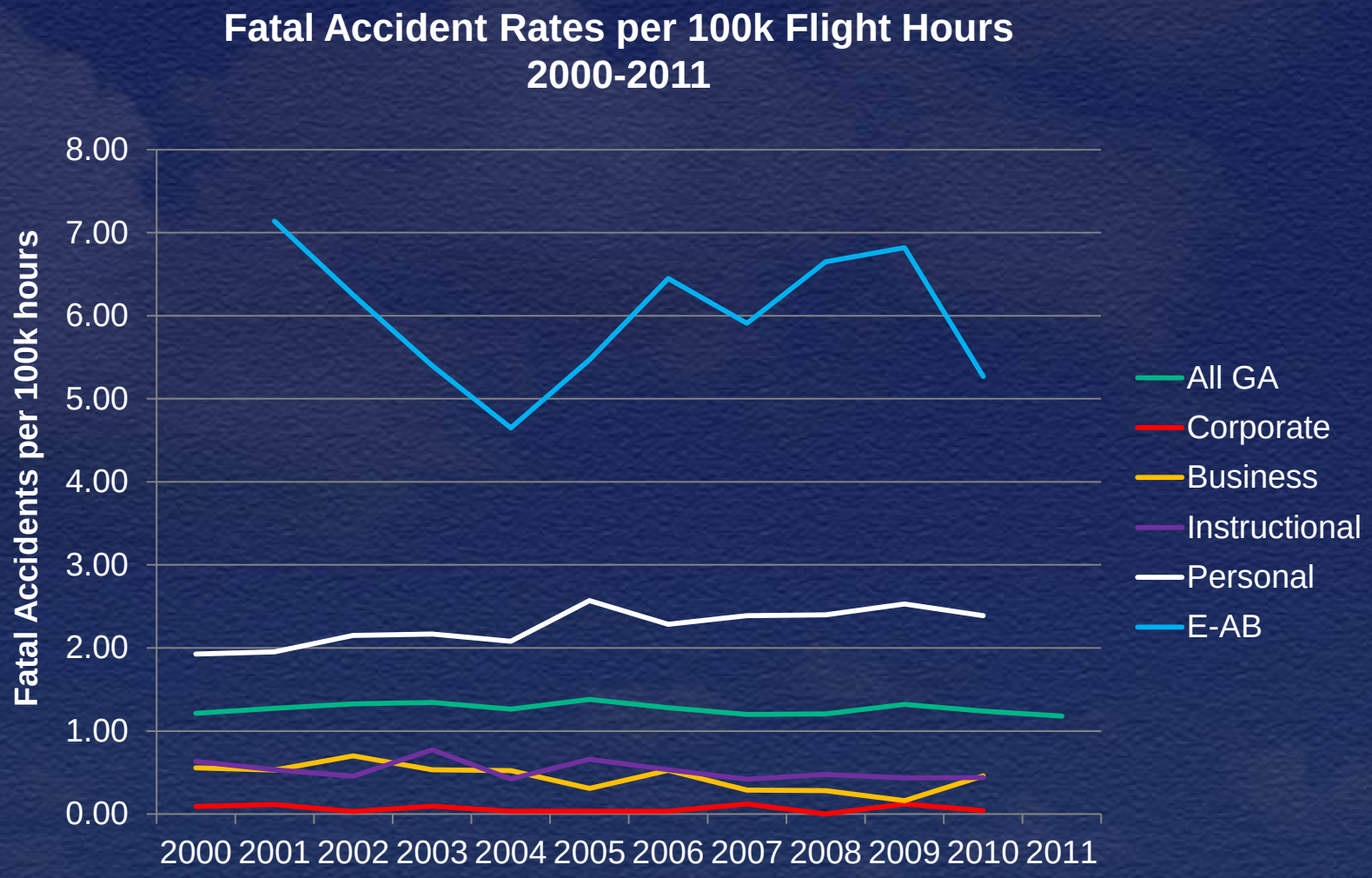
Fatal Accident Rates per 100k Flight Hours



Accident Rates per 100k Flight Hours



Fatal Accident Rates per 100k Flight Hours



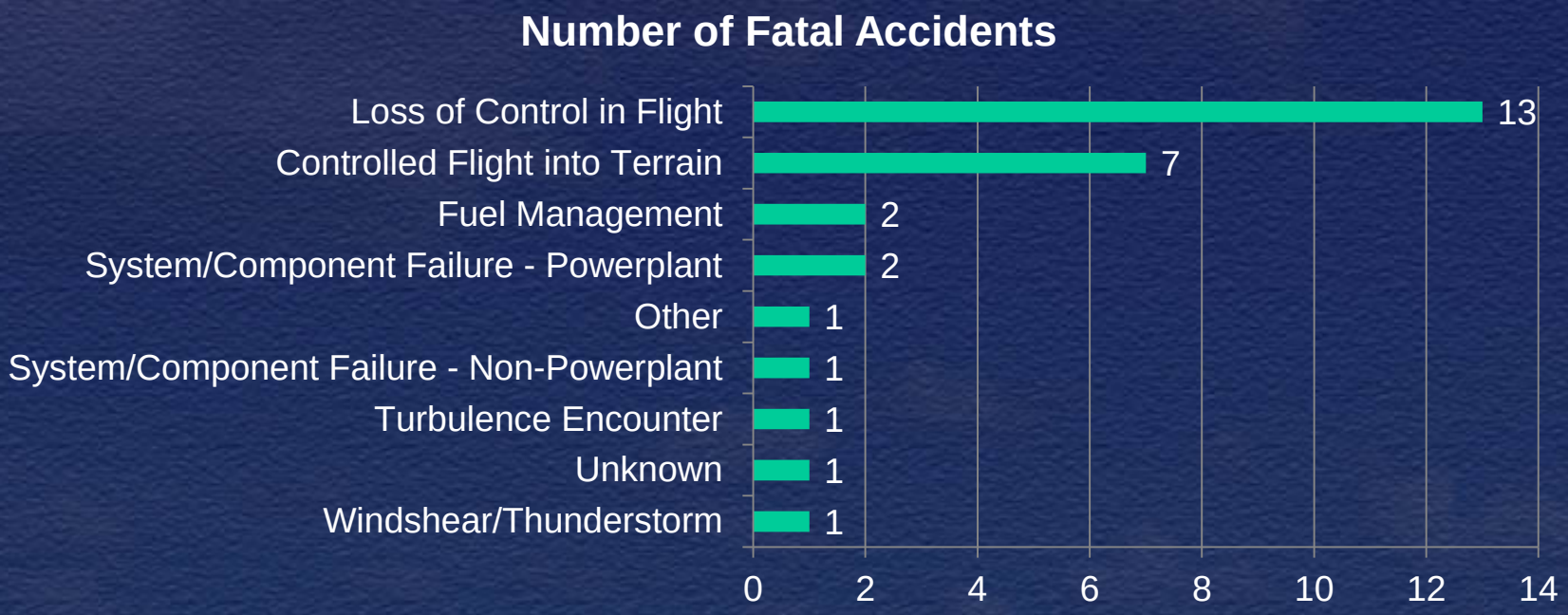
Accident Rates, 2000 - 2011

- Corporate
  - Accident rates approaching that of the airlines.
- Business
  - Total and fatal accidents relatively flat; substantially below the overall GA accident rates.
- Instructional
  - Total accident rate is slightly below the average for all of GA, the fatal rate is substantially lower.
- Personal
  - Total and fatal accident rates have risen, both rates are substantially above the average of all GA flying.

Business Flying, 2008-2012

All accidents – Loss of control (in-flight or on the ground) accounted for the largest portion, followed by system/component failures.

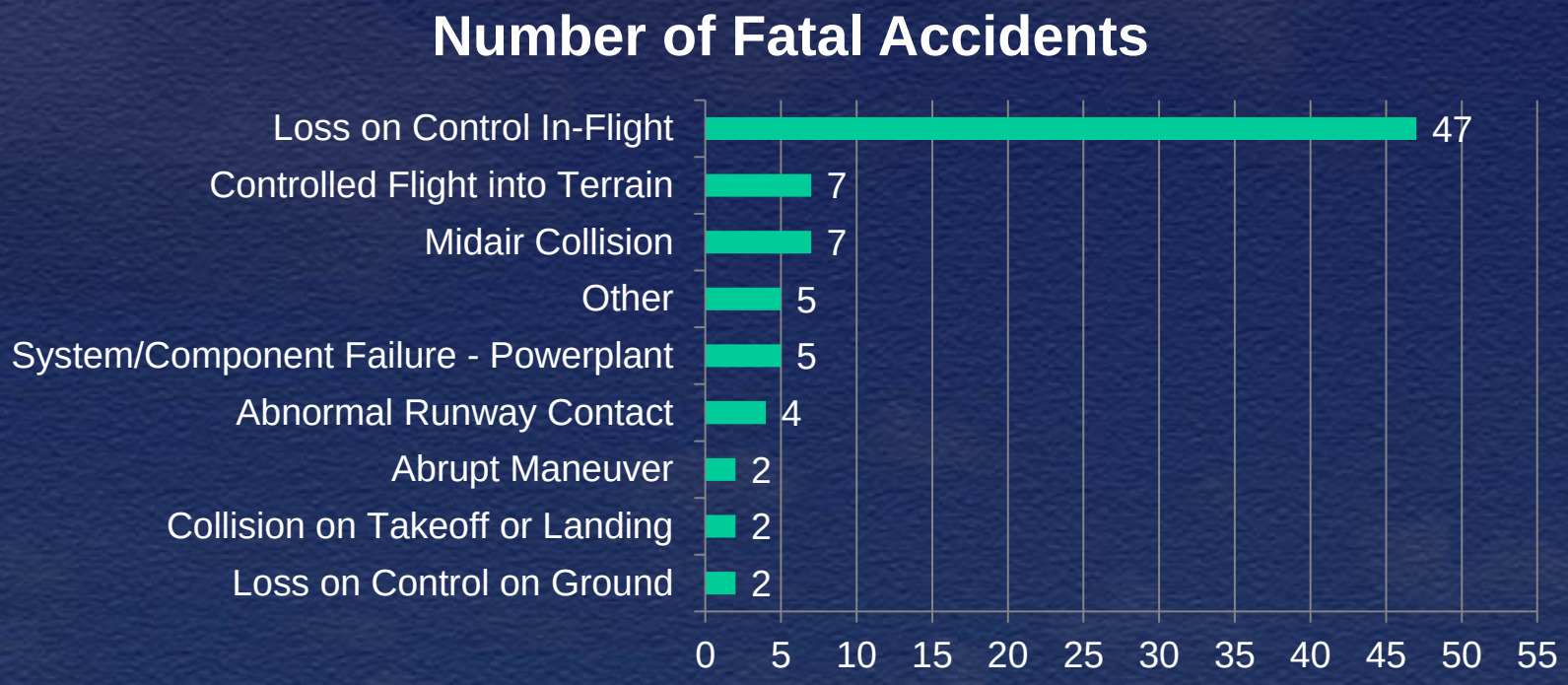
Fatal accidents - Loss of control in flight accounted for the greatest proportion, followed by controlled flight into terrain.



Instructional Flying, 2008-2012

All Accidents - Loss of control on the ground or in-flight and abnormal runway contact accounted for the great majority of defining accident events.

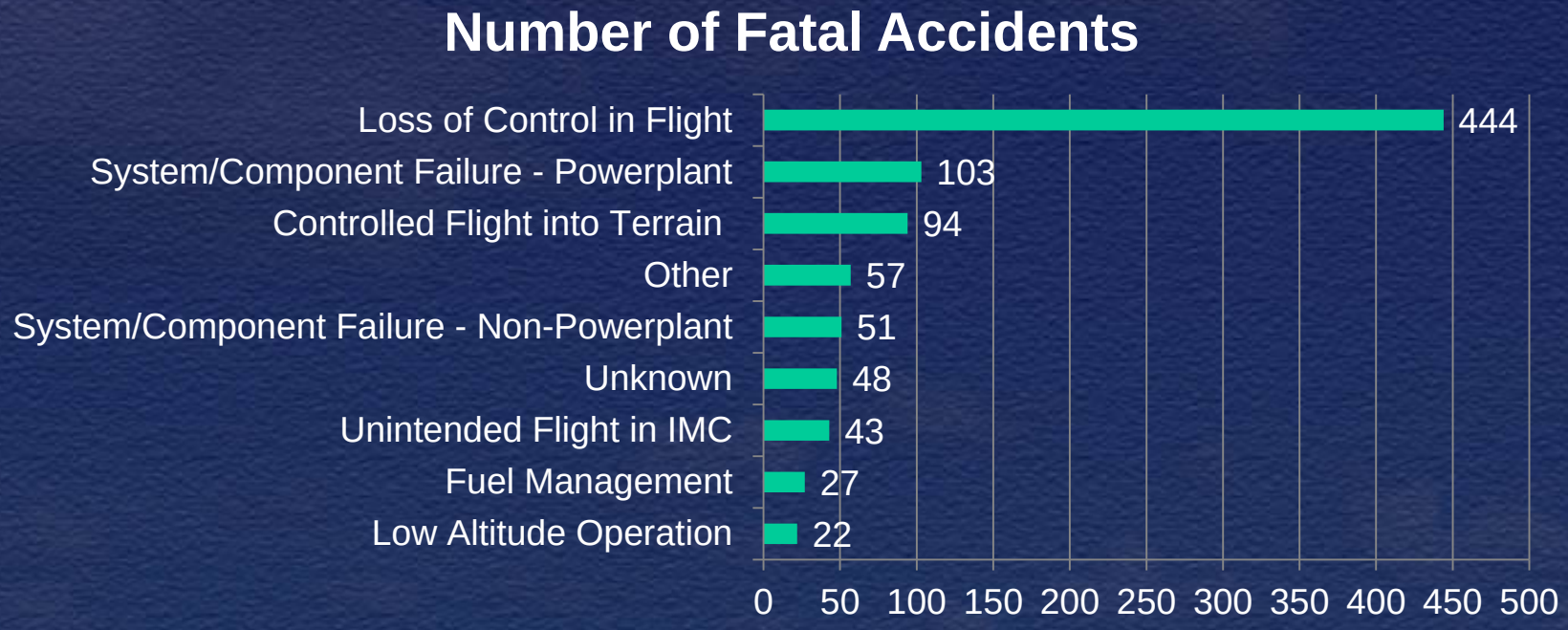
Fatal Accidents – Loss of Control in-flight, followed by Controlled Flight into Terrain.



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.



Safety Alert - Preventing Aerodynamic Stall

- Suggestions to avoid this type of accident
  - Honestly assess your skills
  - Know your airplane
  - React immediately
  - Manage distractions
  - Don’t show off

Alfred Sheinwold

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

SEA08FA042

Image 2. Looking south toward front (north side) of impacted hangar. Wreckage is near left center of photo.

SEA08FA042

Image 5. Looking south at close-up of right engine.

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SEA08FA042

Image 9. Looking north at rear of empennage, which is leaning against adjacent hangar.

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SEA08FA042 (1)

- History of flight
  - Pilot & right seat pax – fatal
  - Two pax uninjured
  - 0755 MST, December 10, 2007
  - Salmon, Idaho
  - Part 91 Corporate/Executive flight
  - Beech King Air 200
  - IFR to Boise, then to Las Vegas

SEA08FA042 (2)

- History of flight
  - Aircraft kept in heated hangar
  - Approximately 0700 aircraft moved outside to ramp
  - Light to moderate snow falling
  - Aircraft not deiced prior to takeoff
  - Takeoff roll started between 0747 & 0750

SEA08FA042 (3)

- History of flight
  - Perception of longer than usual TO roll
  - Rotated at 100 kts
  - Lifted off, touched back down, lifted off again
  - Airplane rolled steeply left and right several times
  - (short narrative)

SEA08FA042 (4)

- Aircraft
  - No pre-impact mechanical malfunctions or failures
  - Engines appeared to operate normally
- Pilot
  - ASEL, AMEL, Instrument Rating
  - More than 14,200 hours total time
  - 300 hours in previous six months
  - King Air Initial Course 5 month prior

SEA08FA042 (5)

- Probable Cause

  An in-flight loss of control due to the pilot's failure to remove ice and snow from the airplane prior to takeoff. Contributing to the accident were the pilot's improper preflight preparation/actions, falling snow, and a low ambient temperature.

CEN09FA087

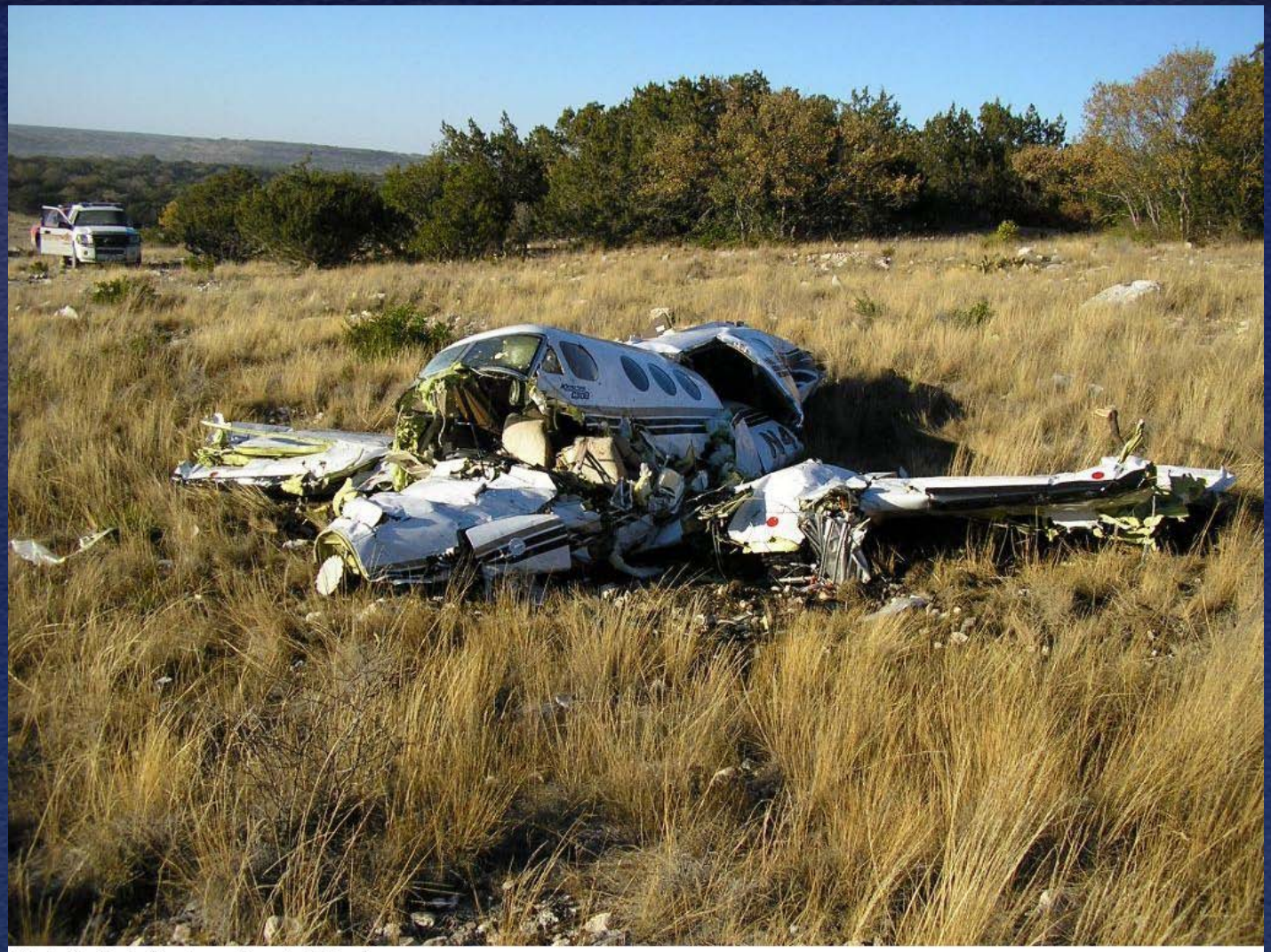

Photo 4 - Main Wreckage from Left Front

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CEN09FA087

Photo 2 - Main Wreckage from 2 oclock

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CEN09FA087 (1)

- History of flight
  - Pilot – sole occupant – fatal
  - Approx 1500, December 14, 2008
  - Rocksprings, Texas
  - Hondo, Texas to Goodyear, Arizona
  - Part 91 Corporate/Executive flight
  - King Air C90
  - Instrument flight plan

CEN09FA087 (2)

- History of flight
  - 7 min after takeoff, cleared to 17,000 ft
  - Radar showed meandering flight path
  - Cleared to FL240 after 6 min at 17,000
  - Last communication with pilot when going through 18,000
  - When at FL240, no intelligible responses to ATC

CEN09FA087 (3)

- History of flight
  - Radar showed aircraft in rapid descent from FL210 to impact
- Pilot
  - SEL, MEL, Instrument Rating
  - Est 3,500 hrs, 1,300 Multi, 250 in A/C
  - King Air recurrent training 2 month prior

CEN09FA087 (4)

- Aircraft
  - 1993, Beechcraft C90, 3725 hrs total
  - Blackhawk Modifications
    - PT6A-135A engines (550 HP)
  - Prior 6 weeks in paint shop
  - No open maintenance discrepancies
- Meteorological
  - VMC conditions

CEN09FA087 (5)

- Findings
  - No preimpact anomalies observed
  - None of the voice transmissions sounded as if Oxygen mask in use
  - Both bleed air switches in closed position
  - Pressurization switch in dump position

CEN09FA087 (6)

- Probable cause

  The pilot's failure to properly configure the pressurization controls, resulting in his impairment and subsequent incapacitation due to hypoxia.

ERA09FA411

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ERA09FA411

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ERA09FA411 (1)

- History of flight
  - Pilot, sole occupant, fatal
  - Approximately 0910, July 17, 2009
  - Impacted trees and mountainous terrain near Hayesville, North Carolina
  - Departed home airfield under VFR to reposition airplane for routine maintenance
  - No flight plan filed

ERA09FA411 (2)

- History of flight
  - Flight from Cleveland, GA to Andrews, NC
  - Radar tracked target for last 19 min.
  - Aircraft gradually descended from 5,600 ft. to 4,700 ft.
  - Wreckage located two days later near peak of Shinbone Ridge at 4,667 ft.

ERA09FA411 (3)

- Aircraft
  - Cessna R182
  - Airplane being returned for propeller governor overhaul
  - Airframe total time 4,807 hrs.
  - Accident pilot was owner of airplane

ERA09FA411 (4)

- Meteorology
  - Area forcast 2 hr. old – scattered 2,000, broken high cirrus at 18,000, isolated thunderstorm and rain showers with tops to 42,000 ft.
  - Active AIRMET for mountain obscuration due to low clouds, precipitation and mist
  - No record of FSS or DUAT briefing

ERA09FA411 (5)

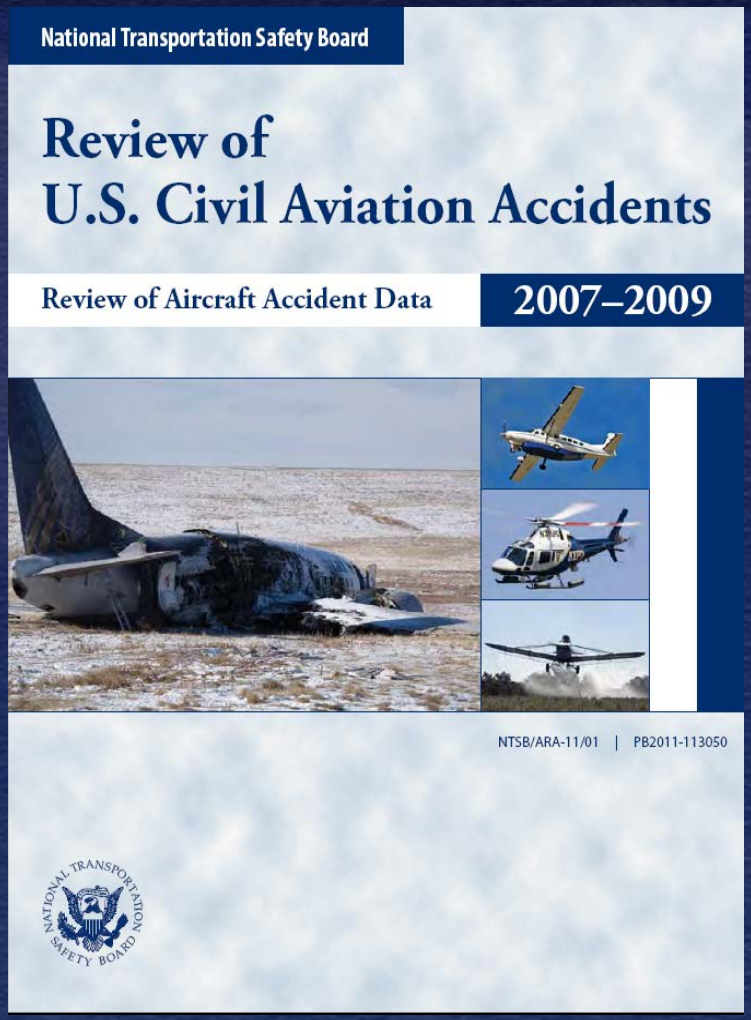
- Pilot
  - ATP, CFI, numerous ratings
  - 20,000 hrs. total time
- Findings
  - Wreckage Altimeter indicated 4,700 ft.
  - Control separations consistent with overload separation
  - No apparent pre-impact deficiencies
  - Post crash fire

ERA09FA411 (6)

- Probable cause

  Flight into terrain for undetermined reasons.

You can try this at home



- 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

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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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