General Aviation and the NTSB Most Wanted List

AASF & NTSB Fall Aviation Safety Seminar
Anchorage, Alaska
November 5, 2016
N6529R - B36TC Bonanza
The NTSB is an independent U.S. Federal agency charged with:

- Determining the probable cause(s) of transportation accidents (aviation, highway, marine, rail, pipeline and hazardous material)
- Making recommendations to prevent their recurrence
- Conducting special studies and investigations
- Coordinating resources to assist victims and their families after an accident
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 2016 Most Wanted List

- Disconnect from Deadly Distractions
- End Substance Impairment in Transportation
- Expand Use of Recorders to Enhance Transportation Safety
- Improve Rail Transit Safety Oversight
- Prevent Loss of Control in Flight in General Aviation
- Promote Availability of Collision Avoidance Technologies in Highway Vehicles
- Promote the Completion of Rail Safety Initiatives
- Reduce Fatigue-Related Accidents
- Require Medical Fitness for Duty
- Strengthen Occupant Protection
Gray Summit, MO – Bus/Truck/Tractor Crash
Distraction
Distraction
2016 MWL - Disconnect from Deadly Distractions

A factor in all modes of transportation:

- Motor vehicle emphasis
  - Electronic devices within the vehicle
- Aviation emphasis
  - Sterile Cockpit
  - Appropriate use of PEDs
  - Manage distractions
End Substance Impairment
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

- Potentially Impairing Drugs
- Potentially Impairing Condition
- Controlled Substances
- Illicit Drugs
Most Common Drugs

• Sedating antihistamines
  – Most common category

• Diphenhydramine
  – Most common individual drug
  – Most common potentially impairing drug
  – Use INCREASING
Medical Fitness for Duty
2016 MWL – *Require Medical Fitness for Duty*

A factor in all modes:

- **Airman Medical** – fitness at exam point
  - Pilots must self-assess fitness
- **Undiagnosed or unreported medical conditions pose threats**
  - Obstructive Sleep Apnea
  - Diabetes
  - High Blood Pressure
Bronx Bus Crash, March 12, 2011

15 KILLED
17 INJURED
Cranbury, New Jersey, June 7, 2014

6 VEHICLES
21 PEOPLE
5 RECEIVED MINOR INJURIES
4 RECEIVED SERIOUS INJURIES
1 PERSON KILLED
2016 MWL - Reduce Fatigue - Related Accidents

A factor in all modes:
- 182 Major investigations (2001 – 2012)
  - 20% involved fatigue
- Need
  - Research, education, training
  - Technology development
  - Hours of service, on/off duty policies
  - Medical treatment of sleep disorders
2016 MWL – Strengthen Occupant Protection

A factor in all modes:
– Numerous investigations showed potential for reduced injuries & fatalities
– Need
  • Enhance survival space & ease of evacuation
  • Increased use of existing restraint systems
  • Shoulder harnesses for GA aircraft
Recorders
A factor in all modes:

• Critical in accident investigation
  – Install crash resistant image recorders in smaller turbine powered aircraft
  – Install flight recorders in transport category and HEMS aircraft
  – Install inward & outward video cameras in trucks, busses, & trains
  – Use PED memory when available
Loss of Control
Loss of Control
2016 MWL – 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
  - Takeoff and Climb
All GA Accidents

Number of accidents

Fatal Accidents
Non-Fatal


*2015 Preliminary numbers
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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Business Flying, 2008-2014

Number of Fatal Accidents

- Loss of Control In-Flight: 18
- Controlled Flight Into Terrain: 11
- Fuel Related: 5
- System/Component Failure - Non-powerplant: 4
- System/Component Failure - Powerplant: 4
- Unknown: 2
- Ground Handling: 1
- Turbulence Encounter: 1
- Windshear/Thunderstorm: 1
**Instructional Flying, 2008-2014**

**Number of Fatal Accidents**

- Loss of Control In-Flight: 10
- Midair: 8
- System/Component Failure-Powerplant: 7
- Controlled Flight Into Terrain: 5
- Other: 4
- Abrupt Maneuver: 4
- Low Altitude Operation: 3
- Collision on Takeoff or Landing: 3
- Unknown: 2
- Abnormal Runway Contact: 2
- Ground Handling: 2
- Loss of control on Ground: 2
- Fuel Related: 1
- Simulated/training event: 1
- Unintended Flight Into IMC: 1
Personal Flying, 2008-2014

Number of Fatal Accidents

- Loss of Control In-Flight: 601
- System/Component Failure - Powerplant: 149
- Controlled Flight Into Terrain: 116
- Other: 66
- System/Component Failure - Non-Powerplant: 62
- Unintended Flight Into IMC: 60
- Unknown: 47
- Fuel Related: 39
- Low Altitude Operation: 33
- Midair: 27
- Abrupt Maneuver: 19
- Collision on Takeoff or Landing: 19
- Abnormal Runway Contact: 15
- Loss of Control on Ground: 11
Loss of Control In-Flight, 2008-2014

Number of Fatal Accidents

- Personal Flying: 601
- Instructional Flying: 69
- Business Flying: 18
- Corporate Flying: 5
Fatalities by CAST/ICAO Common Taxonomy Team (CICTT) Aviation Occurrence Categories


Note: Principal categories as assigned by CAST.

For a complete description of CICTT Aviation Occurrence Categories, go to: http://www.internationalstandards.org/
GA Joint Steering Committee

**Steering Committee**
- **Co-chairs**
  - Steve Gottlieb (FAA/AVP)
  - Bruce Landsberg (AOPA/ASF)
- **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
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 installation policy changed
CAST brings key stakeholders to cooperatively develop & implement a prioritized safety agenda

Industry
- AIA
- Airbus
- ALPA
- APA
- A4A
- IFALPA
- NACA
- Boeing
- GE*
- RAA
- FSF

Government
- DOD
- FAA
  - Aircraft Certification
  - Flight Standards
  - Accident Investigation
  - Air Traffic Operations
  - Airports
- NASA
- ICAO**
- EASA
- TCCA
- NATCA**
- NTSB**

Commercial Aviation Safety Team (CAST)

Other Organizations:
- IATA**
- AAPA**
- ATAC**
- APFA**
- ACI-NA**

* Representing P&W and RR
** Observer
# ASIAS Members

## Commercial Air Carriers (46)

ABX Air  
Aerodynamics, Inc.  
Air Transport Intl.  
Air Wisconsin Airlines  
Alaska Airlines  
Allied Air  
Aloha Air Cargo  
American Airlines  
Atlas Air  
Cape Air  
CommutAir  
Compass Airlines  
Delta Air Lines  
Empire Airlines  
Endeavor Air  
Envoy Air  
ExpressJet  
FedEx Express  
Frontier Airlines  
GoJet Airlines  
Hawaiian Airlines  
Horizon Air  
JetBlue Airways  
Kalitta Air  
Mesa Airlines  
Miami Air Intl.  
Mountain Air Cargo  
National Airlines  
Northern Air Cargo  
Omni Air Intl.  
Piedmont Airlines  
Polar Air Cargo  
PSA Airlines  
Republic Airlines  
Shuttle America  
Silver Airways  
SkyWest Airlines  
Southern Air  
Southwest Airlines  
Spirit Airlines  
Sun Country Airlines  
Swift Air  
Trans States Airlines  
United Airlines  
United Parcel Service  
Virgin America

## General Aviation Operators (30)

Costco Wholesale*  
Eli Lilly  
Embraer Executive Jets  
Flexjet  
Flight Options  
Gama Aviation  
Johnson & Johnson  
NetJets  
Northeastern Aviation Corp  
REVA  
Vulcan, Inc.  
XOJET  
18 additional Operators*

## Industry

ACS—Air Charter Safety Foundation  
Embraer  
GAMA—General Aviation Manufacturers Association  
Gulfstream Aerospace  
NBAA—National Business Aviation Association  
NJASAP—NetJets Association of Shared Aircraft Pilots

## Maintenance, Repair & Overhaul

AAR Aircraft Services  
HAECO Americas

## Government

AMC—Air Mobility Command  
FAA  
NASA  
Naval Air Force Atlantic  
USAF Safety Center  
NTSB

## Academia

University of North Dakota

*Newest Member

As of 22 August 2016
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

• “Off with their heads”
• Safety organization responsible for safety
• Regulator is dictatorial and despised
• Safety expected by regulations

Risk-based & predictive

• Just culture
• Everyone responsible for safety
• Regulator is collaborative and respected
• Safety enhanced via voluntary initiatives
“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.”
QUESTIONS OR COMMENTS?
2016 MWL – Promote Collision Avoidance Technologies (CAT) in Highway Vehicles

• Addresses human performance issues
  – Impairment
  – Fatigue
  – Medical conditions
  – Distraction

• Introduces new set of issues
  – False alerts
  – Over-dependence
Types of Crash Avoidance Technologies

- Alerts
  - Lane Departure Warning
  - Stationary Object Alert
  - Following Distance Alert

- Interventions
  - Automatic Emergency Braking
  - Active Steering Assist
Lessons Learned from Aviation

• Behavior can never fully be controlled

• Training often requires refreshing

• Technology may provide safeguard against human error