The NTSB

- Independent Federal Agency, charged by Congress to:
  - Investigate transportation accidents
  - Determine their probable cause
  - Issue safety recommendations to prevent similar accidents
  - Conduct safety studies
### GA Accident Stats

<table>
<thead>
<tr>
<th>Year</th>
<th>Accidents</th>
<th>Fatal accidents</th>
<th>Fatalities</th>
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<tr>
<td>2006</td>
<td>1515</td>
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<td>2007</td>
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<td>2009</td>
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<td>2010</td>
<td>1329</td>
<td>249</td>
<td>417</td>
</tr>
</tbody>
</table>
Six days, six fatalities

Sunday

At 6:30 PM CDT, 3/20, Baraboo, WI. Cessna 150 (N4178U) crashed under unknown circumstances. Witnesses heard the airplane fly overhead before the accident and reported the airplane sounded normal. Witnesses reported fog in the area at the time of the accident. 2 POB, fatal.

Reasons (CFR) - Sections 393.49, 393.115
Six days, six fatalities

Thursday

Sent: Thu Mar 24 19:55:00 2011
Subject:

Six days, six fatalities

Friday

At 9 AM EDT, Clear Lake, ME. Cessna 185 (N724MT) wreckage discovered in wooded area. A/C missing since 8 PM 3/24, crashed under unknown circumstances. 1 POB, fatal.
Six days, six fatalities

Friday

Sent: Fri Mar 25 15:51:00 2011
Subject:

At 2 PM EDT, Elgin, SC. A single engine aircraft, unknown registration or type, crashed & burned under unknown circumstances. 1 POB, fatal.
Accident type in personal flying accidents, 2007-2009.
According to a witness:

- The 314-hour pilot made a pass over his front yard approximately 200 feet agl. While passing over the field, the pilot leaned out the right side of the cockpit and waved at his neighbors.

- The airplane then pitched nose up, rolled to the right, and flew “straight into the ground” in a nose-down attitude.
What was missing?

• Operational discipline
• Professionalism
NTSB finding

• “The captain allowed an atmosphere in the cockpit that did not comply with well-designed procedures intended to minimize operational errors, including sterile cockpit adherence, and this atmosphere permitted … inappropriate conversation; nonstandard terminology; and a lack of checklist discipline throughout the descent and approach phases of the flight.”
What was missing?

- Operational discipline
- Professionalism
Colgan Air flight 3407

- February 12, 2009
- 10:17 pm Eastern Standard Time
- Colgan Air, Inc.
  - Operated as Continental Connection
- Bombardier DHC-8-400
- On approach to Buffalo, New York
- 50 fatalities
  - 2 pilots
  - 2 flight attendants
  - 45 passengers
  - 1 home resident killed
History of flight

- Crew engaged in almost continuous conversation throughout flight
  - Conversation mostly extraneous to flight operations

- Conversation preempted timely performance of flight-related duties
  - Approach briefing, descent checklist, approach checklist
History of flight

• Approximately 3 miles from outer marker:
  – power was reduced to slow for approach
  – gear extended
  – props to max RPM

• Airspeed decreased 50 kts in 21 seconds
Stall, Upset, Loss of Control

- Stick shaker (stall warning) activated at 131 knots
- Autopilot disconnected
- Captain reacted with “startle and confusion”
- Captain pulled nose to 19 degrees nose up pitch
- Stall, extreme roll
- Stick pusher activated 3 times
  - countered by captain’s actions of pulling
- Loss of control
HOT-2: gear’s down.
HOT-1: flaps fifteen before landing checklist.
HOT-2: uhhh.
NTSB
National Transportation Safety Board
Office of Research and Engineering

Flightpath
Loss of Control on Approach
Colgan Air, Inc., Operating as
Continental Connection Flight 3407
Bombardier DHC-8-400, N200WQ
Clarence Center, New York
February 12, 2009
DCA09MA027
Board Meeting
Major Areas of Focus

- Airspeed Selection
- Cockpit Discipline
- Crew Reaction to Stall Warning and Stall
• The captain’s failure to effectively manage the flight
  – enabled conversation that delayed checklist completion and conflicted with sterile cockpit procedures, and
  – created an environment that impeded timely error detection
What was missing?

• Operational discipline
• Professionalism
Pinnacle Airlines Flight 3701
Jefferson City, Missouri

- October 14, 2004
- Bombardier CL-600-2B19
- Repositioning flight
- Both flight crewmembers killed
What the investigation discovered

- Intentional activation of stall warning
- Swapping crew seats
- Rudder mishandling
- Climb to FL 410
  - “have a little fun”
- Automation mismanagement
- Airspeed loss, stall, loss of control, double engine failure
- Did not fully disclose real problem with ATC
NTSB’s Probable Cause

• “the pilots’ unprofessional behavior, deviation from standard operating procedures, and poor airmanship, which resulted in an in-flight emergency from which they were unable to recover…”
What was missing?

• Operational discipline
• Professionalism
• “The pilots’ failure to ensure that the airplane’s weight and center of gravity were within approved takeoff limits was symptomatic of poor airmanship and a broader pattern of deficiencies in their crew resource management skills (specifically in the areas of leadership, workload management, communications/briefings, and crew coordination) that were exhibited on the day of the accident.”
What was missing?

- Operational discipline
- Professionalism
Part 135 Operator

- Sundance Helicopters
- Air tour operator
- September 20, 2003
- Grand Canyon
- Aerospatiale AS350BA
- CFIT, 7 Fatalities
Accident Flight

AS350BA at 69° left bank
Accident Flight

AS350BA at 55° nose-low pitch
Previous flight

AS350BA at 99° left bank
What was missing?

• Operational discipline

• Professionalism
Comair Airlines Flight 5191
Lexington, Kentucky

- Bombardier CRJ
- 49 Fatalities
- First officer severely injured
- Wrong runway takeoff
NTSB Finding

• “The flight crew’s noncompliance with standard operating procedures, including the captain’s abbreviated taxi briefing and both pilots’ nonpertinent conversation, most likely created an atmosphere in the cockpit that enabled the crew’s errors.”
What was missing?

• Operational discipline
• Professionalism
A Few Tips to Avoid This
“You never know on which flight your career will be judged.”
Pilots’ acts might have led to crash

Tail section of doomed jet found on ocean floor

By ERIC MALIN, MATT SURMAN and MITCHELL LANDSBURG
Los Angeles Times

PORT HUENEME, Calif. — Investigators are considering whether the pilots of Alaska Airlines Flight 251 unwarily triggered their violent plunge into the Pacific Ocean by following prescribed procedures for an emergency landing, safety officials said Thursday.

Late Thursday searchers found the tail of the jet after recovering the flight data recorder earlier in the day.

Underwater robots exploring the ocean floor found where the wreckage came to rest after the MD-83 jet, some of which are believed trapped under its debris.

National Transportation Safety Board officials raised the question about the pilots’ actions after listening to a recording of the final 30 minutes that was contained in a cockpit voice recorder retrieved into Wednesday.

One NTSB official, speaking on condition of anonymity, said the investigation into the crash is increasingly focusing on the pilots’ actions during their preparation for an emergency landing at Los Angeles International Airport.

In hindsight, investigators say, it appears possible that a by-the-book response to the mechanical problem reported by the pilots — a “completely stabilizer jam” — could have sent the plane into its wild, corkscrewing descent into the sea.
Take the Most Conservative Approach
What to do?

Take the most conservative approach

De-ice?  Don’t de-ice
Divert?  Continue?
Add more fuel?  Risk min fuel landing?
NTSB
SOP Adherence
How SOPs relate to error

• LOSA data: crews that intentionally deviate from SOPs are approximately three times more likely to commit additional errors with consequential results.

• “Normalization of Deviance”
What is a professional?

• A mindset
  – Precise checklist usage
  – Precise callouts
  – Precise compliance with SOPs and regulations
  – Staying abreast and current with knowledge and skills
  – The ability and willingness to say “I don’t know” or “I am wrong”
Professionalism

Doing the right things, even when no one is watching.