



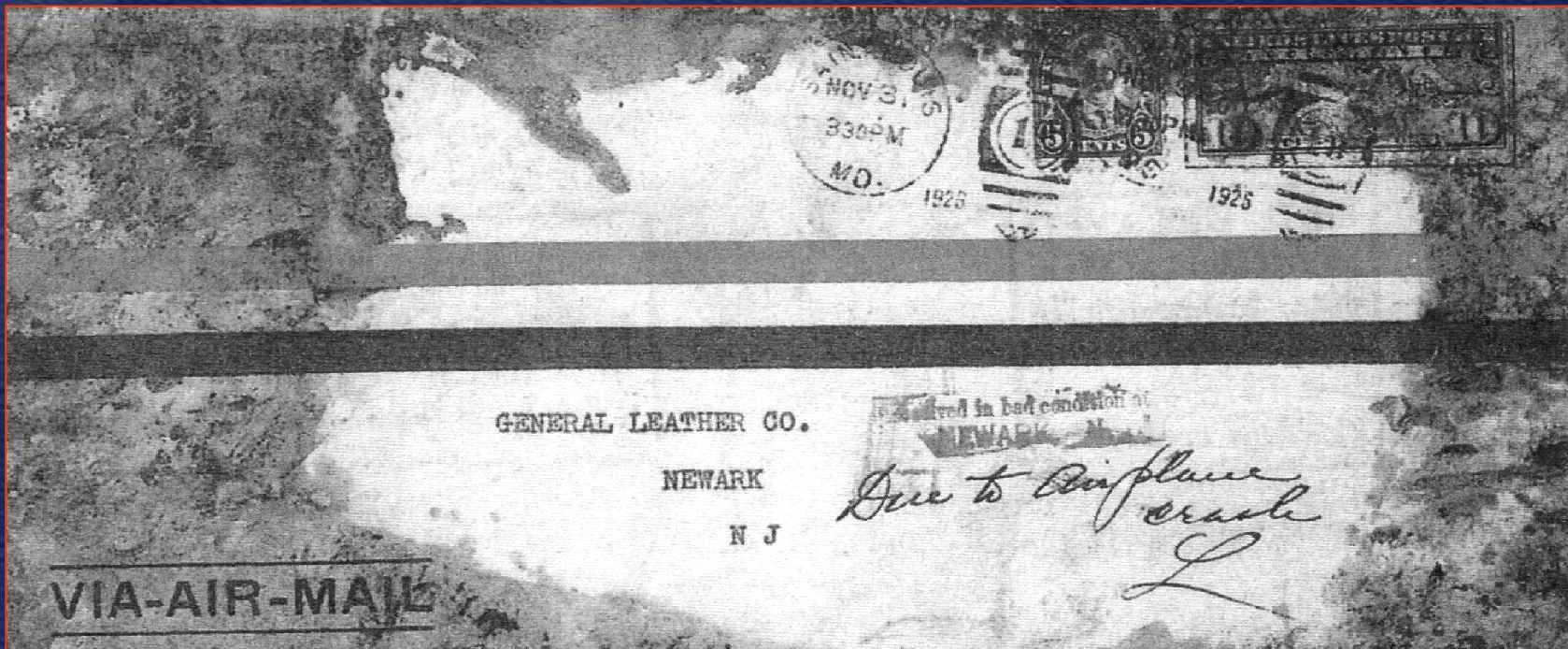
**NTSB** National Transportation Safety Board

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# **Reduce Aviation Accidents and Incidents Caused by Fatigue: It's Time to Act!**

Robert L. Sumwalt  
Vice Chairman





Nov 3, 1926  
St. Louis - Chicago





NTSB





# Charles A. Lindbergh



“My mind clicks on and off... I try letting one eyelid close at a time when I prop the other open with my will. But the effort's too much. Sleep is winning. My whole body argues dully that nothing, nothing life can attain is quite so desirable as sleep. My mind is losing resolution and control.”



# NTSB reports on pilots falling asleep

## Feds want to rewrite rules to curb fatigue

By Alan Levin  
USA TODAY

WASHINGTON — Two airline pilots fell asleep while cruising over Hawaii last February, flying past their destination toward open ocean for 18 minutes before waking up and returning for a safe landing, federal accident investigators revealed Tuesday.

That incident and an accident in Traverse City, Mich., last year highlight the need for more comprehensive rules to stem the growing list of crashes attributed to the lengthy hours that pilots routinely work, the National Transportation Safety Board (NTSB) said. Crashes linked to fatigue have killed 249 people since 1997, according to NTSB records.



By Marco Garcia, AP

**Fatigue to blame:** Two Go Airlines pilots working a "demanding" schedule fell asleep and flew past their destination February.

"It's an insidious issue," NTSB Chairman Mark Rosenker said. "Many times the pilots themselves don't recognize that they are fatigued when they get into that cockpit."

The NTSB voted to recommend that federal aviation regulators and airlines use fatigue studies to rewrite the rules for

how long pilots can legally fly. Currently, federal law allows pilots to work up to 16 hours a day, including up to eight hours behind the controls, and loopholes allow longer days in some situations.

Air-traffic controllers frantically radioed Go Airlines Flight 1002 from Honolulu to Hilo,

Hawaii, for 18 minutes on Feb. 13, but got no response from the pilots, said NTSB investigator Jana Price.

In the safety board's first disclosure of details from the investigation, Price said both pilots "unintentionally fell asleep" as the Bombardier CRJ-200 jet flew at 21,000 feet. The jet carried 40 passengers.

The two pilots had been flying together for three arduous days "that involved early start times" and a "demanding" sequence of short flights, Price said. Since the incident, the captain had been diagnosed with severe obstructive sleep apnea, she said. Apnea causes people to repeatedly wake up during the night and has been linked to poor work performance and accidents.

In a separate investigation, the NTSB concluded that a regional airline crash last year in Traverse City was probably triggered by fatigue. Pinnacle Airlines Flight 4712 skidded off the end of a snowy runway on April

12, 2007, after landing in the early hours of the morning. None of the 49 passengers, two pilots and a flight attendant were injured.

The NTSB found that the pilots of the Bombardier CRJ-200 should never have attempted the landing.

The runway was too slick to land under the airline's rules, but the pilots failed to perform a basic landing calculation and missed other warning signs that the weather was deteriorating.

The accident happened after the pilots had worked 14 hours. The cockpit recorder overheard the pilots yawning and the captain made repeated references to being tired, the NTSB found.

The NTSB has been calling for reform of pilot work rules for decades. Several attempts to rewrite pilot work rules have failed in the face of opposition from airlines and pilot groups.

Contributing: Dennis Camire of Gannett News Service

# **Fatigue is Real and it Does Affect Safety**

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“The nose is down, the wing low, the plane is diving and turning. I've been asleep with open eyes... I kick left rudder and pull the stick back...

“My eyes jump to the altimeter...I'm at 1600 feet. The turn-indicator leans over the left - the airspeed drops - the ball rolls quickly to the side...My plane is getting out of control!”

# Continental Express, Pine Bluff, AR

- April 29, 1993
- EMB-120 RT
- Climbing through 17,400 msl
  - Stall, loss of control
  - 111 degree bank angle
  - 67 degrees nose down pitch
- Recovered at 5500 msl
- Left prop shed 3 blades
- Long forced landing on closed runway
- Runway overrun
- Crew's failure to maintain professional cockpit discipline, inattention to flight instruments, selection of inappropriate automation mode

Contributing to the accident: Fatigue induced by the flightcrew's failure to properly manage provided rest periods.



# Corporate Airlines dba American Connection Flight 5966



- October 19, 2004
- Kirksville, Missouri
- BAE J-32 (Jetstream)
- Nighttime non-precision instrument approach
- CFIT
- 13 fatalities
- 2 serious injuries



# Recipe for fatigue-related accident

- Crew on duty 14 ½ hours
  - Previous two days long also
- Less than optimal overnight rest time available
- Early reporting time
- 6<sup>th</sup> flight of day
- Low ceilings and visibility throughout the day
- High demands of manually-flown nighttime, non-precision approach
  - PLUS –
- Crew failure to follow SOPs and less than professional demeanor



# Findings

- Existing FAA pilot duty regulations do not reflect recent research on pilot fatigue and sleep issues, increasing the possibility that pilots will fly in a fatigued condition.
- Providing pilots with additional fatigue-related training...may increase their awareness and use of fatigue avoidance techniques and thus improve safety margins.

Issued Recommendations to FAA



# Shuttle America, Inc., dba Delta Connection Flight 6448



- February 18, 2007
- Embraer ERJ-170
- Cleveland, Ohio
- Runway Overrun
- No fatalities



# Shuttle America

- Captain had slept only 1 out of the past 32 hours.
  - Did not advise Shuttle America of his fatigue or remove himself from duty because he thought he would be terminated.
- Captain stated that his lack of sleep:
  - affected his ability to concentrate and process information to make decisions
  - he was not “at the best of [his] game.”



# Shuttle America

## Contributing to the Probable Cause:

“the captains’ fatigue, which affected his ability to effectively plan for and monitor the approach and landing, and

“Shuttle America’s failure to administer an attendance policy that permitted flight crewmembers to call in as fatigued without fear of reprisals.”

Issued Recommendations to FAA



# Pinnacle Airlines flight 4712



- April 12, 2007
- Bombardier/Canadair RJ CL600-2B19
- Traverse City, Michigan
- Runway Overrun
- No fatalities



# FedEx at Tallahassee, Florida

- July 26, 2002
- FedEx Boeing 727-200
- CFIT, approach and landing accident
- 3 serious injuries
- Aircraft destroyed





# Med Flight Air Ambulance, Inc



- Oct. 24, 2004
- Learjet 35A
- San Diego, CA  
(departing Brown Field)
- Nighttime repositioning  
for an EMS
- CFIT, mountainous  
terrain
- 5 Fatalities



# American Airlines flight 1420

- June 1, 1999
- MD-82
- Little Rock, AR
- Runway overrun
- 11 Fatalities
- 45 Serious





# Korean Airlines flight 801



- August 6, 1997
- B-747-300
- Nimitz Hill, Guam
- CFIT
- 228 Fatalities
- 26 Serious



# American International Airways

- August 18, 1993
- DC-8 freighter
- Guantanamo Bay Naval Air Station, Cuba
- Stall and loss of control on final approach
- 3 Serious injuries



# Fatigue in aviation kills!

- During the last 15 years, fatigue has been associated with over 250 fatalities in air carrier accidents investigated by NTSB

- Countless GA fatalities





# **NTSB has a Long-Standing Concern about Fatigue**

# Fatigue-related Recommendations

- Safety Board has issued 117 fatigue-related safety recommendations since 1972 (all transportation modes)
  - 34 related to aviation
    - Apply to flight crews, mechanics, ATC
    - Issued to FAA, union, airline, association, DOT, and a commercial space launch company



# Most Wanted List

- Fatigue has been on NTSB Most Wanted List since 1990
- Today's MWL has 7 aviation fatigue-related recommendations
  - ATC
  - Maintenance
  - Flight crew



# Comprehensive Approach

- Flight and Duty Regulations
  - Set working hour limits based on fatigue research, circadian rhythms, and sleep and rest requirements
- Fatigue Management Systems/FRMS
  - Comprehensive, tailored approach to address fatigue in the workplace
- BOTH are needed to fully address the issue of fatigue.



# Some things have changed



1981



2004

**But others have not ...**



# But others have not ...

- Same myths:
  - Fatigue is a sign of weakness
  - Fatigue is something you can overcome with coffee and willpower
  - “We’re paid to do the job, we can handle it.”
- Despite what we have learned, despite great research, despite great intentions...



We still have not made significant changes to adequately address fatigue in aviation.

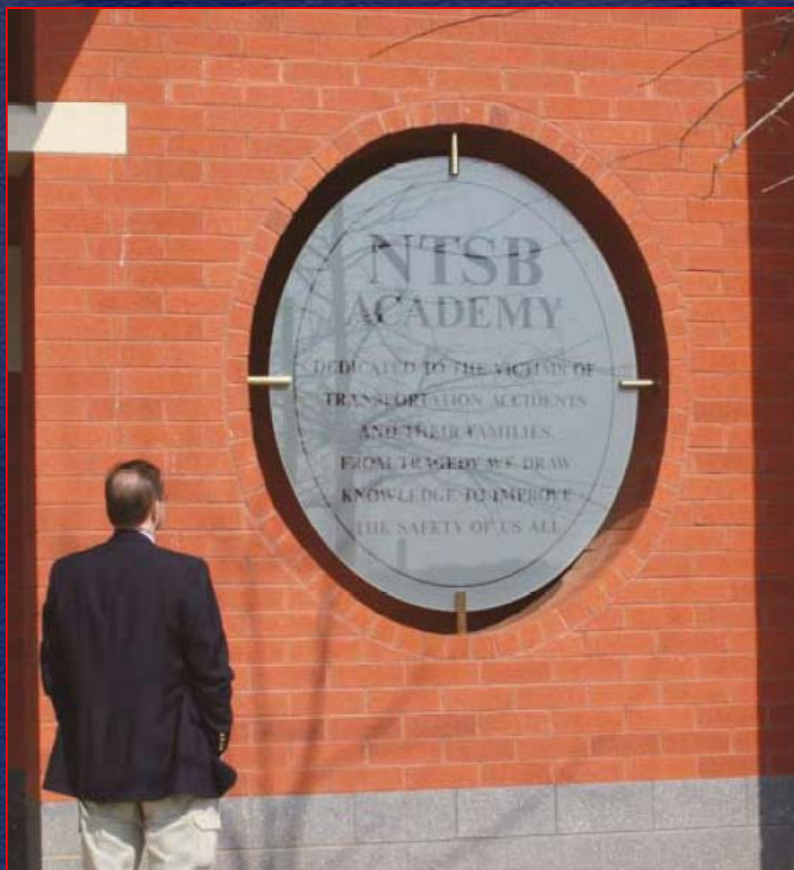


# **It is Time to Implement Workable Solutions**

**NTSB**







“From tragedy we draw knowledge to improve the safety of us all.”

NTSB





“I’ve got to find some way to keep alert. There’s no alternative but death and failure.”





**NTSB**