



**NTSB** National Transportation Safety Board

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# Aviation Fatigue Management Systems

# Safety Board Aviation Fatigue Recommendations

- 32 aviation recommendations since 1972
- On Most Wanted List since 1990
- Most recommendations concern flight and duty time regulations and policies
- Recent accidents highlight the need for comprehensive fatigue management efforts



# Corporate Airlines Flight 5966

- October 19, 2004, Kirksville, Missouri
- Fatigue likely contributed to pilots' degraded performance
  - Long duty day
  - Early report time
  - Multiple takeoffs and landings
- Two recommendations to FAA
  - Include fatigue information in training programs
  - Modify and simplify flight crew hours of service

# Shuttle America Flight 6448

- February 18, 2007, Cleveland, Ohio
- Contributing factors included captain's fatigue and company attendance policy
  - Captain suffered from insomnia
  - Awake 31 of 32 hours
  - Did not “call in fatigued” due to fear of reprisal
- Two recommendations to FAA
  - Develop “best practice” attendance policy that considers fatigue
  - Require operators to implement policy



# Go! Flight 1002

- February 13, 2008, Hilo, Hawaii
- Flew past destination, unresponsive to calls
- Pilots unintentionally fell asleep
- Trip schedules involved repeated early start times and numerous short flight segments
- Captain subsequently diagnosed with severe obstructive sleep apnea

# Fatigue Risk Factors

- Sleep deprivation
- Circadian variability
- Time awake
- Health factors (for example, sleep disorders)
- Environmental issues (for example, workload)





# Fatigue Management Systems

- Intended to reduce fatigue and fatigue-related errors, incidents, and accidents
- Employ multiple countermeasures to mitigate fatigue
- Shared responsibility of operator and crews
- Continuous evaluation and improvement



# Fatigue Countermeasures

- Scheduling policies and practices
- Attendance policies
- Medical screening and treatment
- Environmental changes
- Commuting policies
- Napping policies
- Education



# New Zealand Aviation Industry

- Regulations allow air carriers to propose alternative fatigue management systems
- Operators must address multiple factors, including duty times, rest periods, time zone changes, and circadian variability
- 2006 report revealed no differences between operators with and without approved alternative systems

# easyJet

- European carrier identified fatigue risk with rapidly rotating schedules
- Obtained approval for 6-month trial of alternative schedule and fatigue management system
- Scientific evaluation demonstrated benefits and led to full adoption
- Trial program by U.S. carrier produced similar results



# System Evaluation

- Determine what will be measured
  - Sleep quantity and quality
  - Performance
  - Errors, incidents
- Set goals for expected change

# FAA Efforts

- Work with International Civil Aviation Organization
- Ultra-long-range flights
  - Ops spec and evaluations
- Aviation Fatigue Management Symposium



# Summary

- Fatigue management systems hold promise
- Complement to improved duty hours regulations
- Guidance is needed for operators to establish fatigue management systems
- Fatigue management systems must be continually evaluated to ensure their success



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**End of Presentation**