



**NTSB** National Transportation Safety Board

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# **Work Hours vs. Fatigue Management: The Transportation Experience**

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# Go! Flight 1002



- early starts, multiple segment days, sleep apnea

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# Reagan National Airport (DCA)

- March 23, 2011: 0004 – 0028 EDT
  - air traffic control service interruption
  - 2 AC/TRACON unable to establish contact
- Controller
  - supervisory controller working alone
  - 20 years' experience, 17 at DCA
  - fourth consecutive night shift (10 pm - 6 am)
  - reported to NTSB he had fallen asleep

10 fatalities  
3 serious injuries  
2 minor injuries  
5 no injuries



**Ford  
Windstar**

**Hyundai  
Sonata**

**Kia  
Spectra**

# Probable Cause (fatigue)

“ . . . driver’s fatigue, caused by the combined effects of acute sleep loss, circadian disruption associated with his shift work schedule, and mild sleep apnea, which resulted in the driver’s failure to react to slowing and stopped traffic ahead by applying the brakes or performing any evasive maneuver to avoid colliding with the traffic queue. . . . ”

# Owatonna, MN/July 31, 2008



8 fatalities

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# Probable Cause/Contributing Factors

“The National Transportation Safety Board determines that the probable cause of this accident was the captain’s decision to attempt a go-around late in the landing roll with insufficient runway remaining. Contributing to the accident were (1) the pilots’ poor crew coordination and lack of cockpit discipline; **(2) fatigue, which likely impaired both pilots’ performance;** and (3) the failure of the Federal Aviation Administration to require crew resource management training and standard operating procedures for Part 135 operators.”

# Fatal Airline Accidents (fatigue cited)

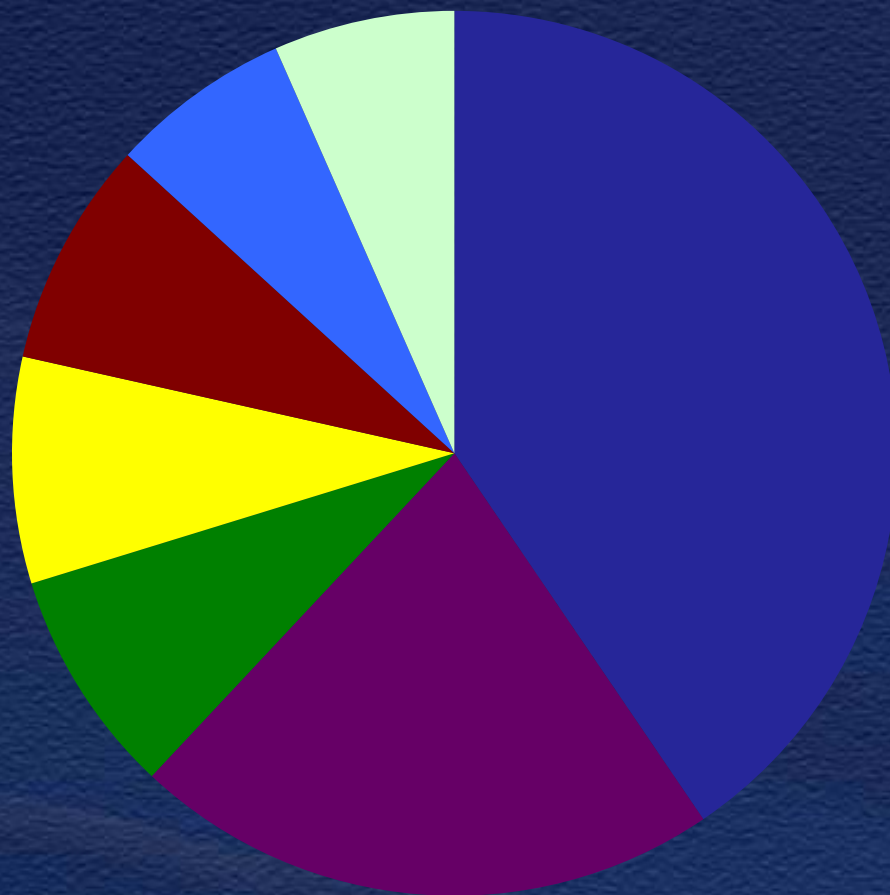
- 8/97 Guam: 228 fatalities
- 6/99 Little Rock AK: 11 fatal
- 10/04 Kirksville MO: 11 fatalities
- 8/06 Lexington KY: 49 fatalities
- 2/09 Buffalo NY: 49 fatalities



# NTSB Fatigue Recommendations

- MOST WANTED since 1990
- 190+ fatigue recommendations

# Complex Issue: Requires Multiple Solutions



- Scheduling Policies and Practices
- Education
- Organizational Strategies
- Raising Awareness
- Healthy Sleep
- Vehicle and Environmental Strategies
- Research and Evaluation

# Scheduling Policies and Practices

Victoria, Texas, January 2, 2008



Victoria, Texas Fire Department

- 1 fatality, 47 injuries; day sleep, night drive, ~ 4 am WOCL

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# Hours of Service / Scheduling

- Science-based hours of service
- Allow for at least 8 hours of uninterrupted sleep
- Reduce schedule irregularity and unpredictability

# Scheduling Policies and Practices

- When possible, address:
  - schedule inversion
  - day sleep/night work
  - rotating schedules
  - extended duty days
  - opportunity for 8 hrs uninterrupted sleep

# Fatigue Management Systems

- Develop guidance based on empirical and scientific evidence for operators to establish fatigue management systems
- Develop and use a methodology that will continually assess the effectiveness of fatigue management systems

# The Challenges . . .

- Diverse operational requirements
- Individual differences
- Complex physiology
- History (“that’s how its always been”)
  - Economics

# Hours of Service

- Necessary but not sufficient



# Fatigue Management Programs

- Comprehensive approach
- Multiple components
- Science based
- Continuously evaluated and updated
- Complements HOS regulations

# Fatigue Management Program

- Education
- Strategies
- Scheduling
- Healthy sleep
- Outcomes/evaluation
- Design/technology
- Policy/regulation (HOS)
- Scientific basis/guidance

# Considerations for Healthcare

- Activities/policies science-based:
  - 'evidence-based practice'
  - acknowledge 'gaps'
- Translate science
  - practical
  - effective
- Evolve
  - data-driven measures
  - incorporate change process



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