NTSB National Transportation Safety Board

Managing Fatigue to Enhance Aviation Safety: Issues and Opportunities

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Board Member

MITRE Aviation Fatigue Symposium
June 6-8, 2011

Go! Flight 1002

- early starts, multiple segment days, sleep apnea

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Honorable John K. Lauber:

No Accident ≠

Safe Operation

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Guantanamo Bay Cuba

First NTSB aviation accident to cite fatigue as probable cause

- acute sleep loss, sleep debt, circadian disruption

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Uncontrolled In-Flight Collision with Terrain
AIA Flight 808, Douglas DC-8-61, N814CK
U.S. NAS, Guantanamo Bay, Cuba, August 18, 1993

"The National Transportation Safety Board determines that the probable causes of this accident were the impaired judgment, decision making, and flying abilities of the captain and flight crew due to the effects of fatigue…"

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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."

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Fatal Airline Accidents (Examples) (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
- 7/08 Owatonna MN: 8 fatalities
- 2/09 Buffalo NY: 49 fatalities

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NTSB Fatigue Recommendations

- MOST WANTED since 1990
- 190+ fatigue recommendations

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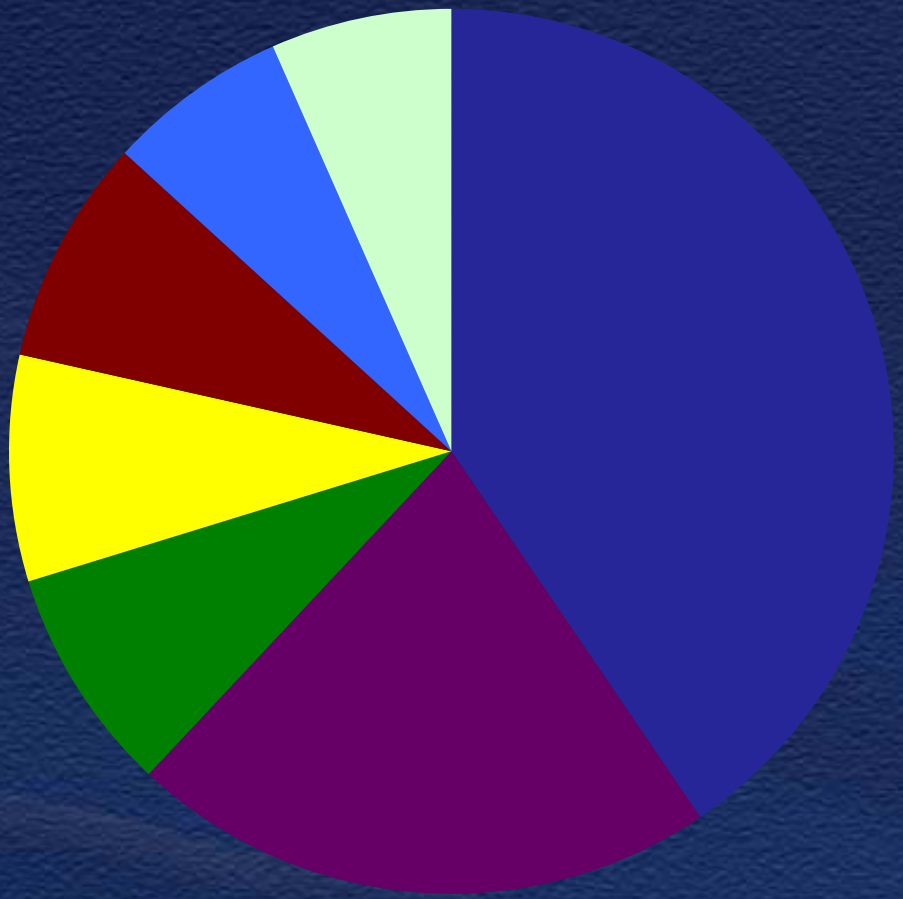
Complex Issue: Requires Multiple Solutions



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

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30+ Years of Progress: History, Context . . . Foundation

- 1980 Congressional request to NASA
- NASA created Fatigue/Jet Lag Program:
  1) determine extent of fatigue, sleep loss, and circadian disruption in flight operations
  2) determine how fatigue affected flight crew performance
  3) develop strategies to maximize performance and alertness during flight operations

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NASA Fatigue/Jet Lag Program

- Research included classic field studies:
  - short haul
  - long haul
  - overnight cargo
  - North Sea helicopter
- Data collected during flight operations:
  - circadian rhythms (physiological)
  - sleep (actigraphy)
  - subjective/diary

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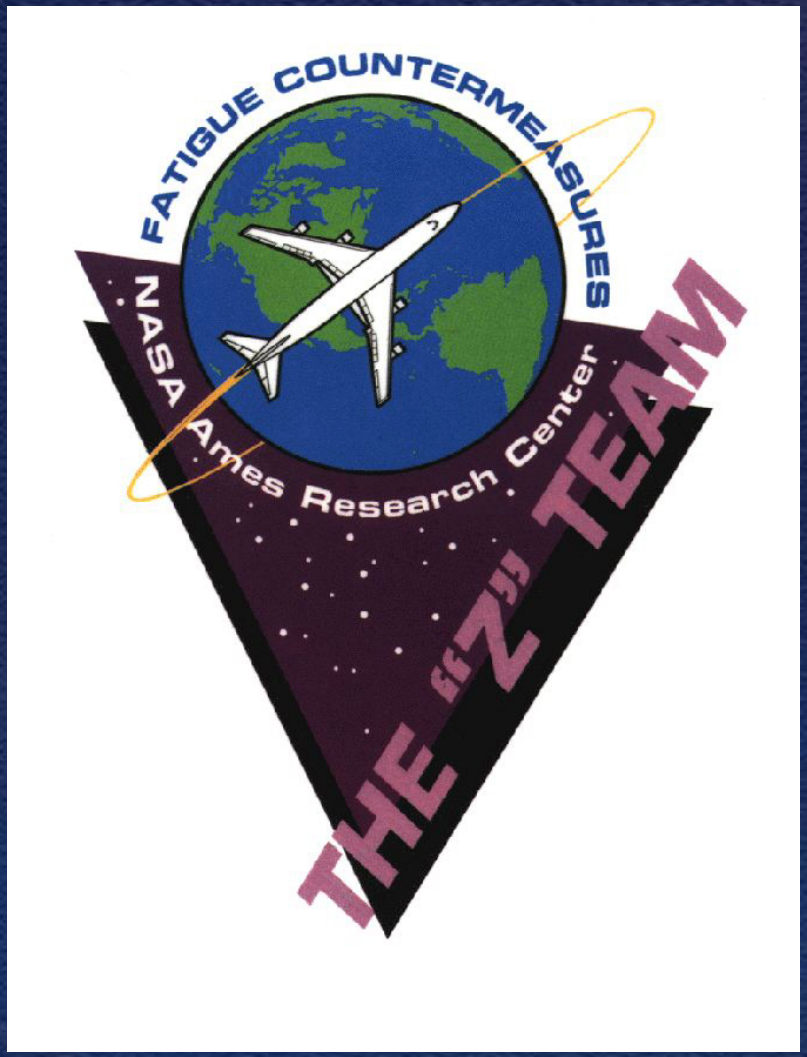
1991: NASA Program Evolved



NASA Fatigue Countermeasures Program

- Translate scientific findings into ops use:
  1) research
  2) equipment development
  3) education and training
  4) NTSB collaborations
  5) policy support

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Many Active Groups (examples)

- Federal Aviation Administration
- Walter Reed Army Institute of Research
- Armstrong Aeromedical Research Laboratory
- Civil Aeromedical Institute (CAMI/FAA)
- Institute of Aviation Medicine (United Kingdom)
- DLR (Germany)
- Karolinska Institute (Sweden)
- France, Canada, Netherlands, Japan . . .

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2000 - Now: Continued Progress

- Ultra Long Range (ULR) operations
- Studies: pilots, flight attendants, air traffic controllers, maintenance personnel
- Biomathematical modeling
- FAA duty/rest NPRM, FRMS AC, Fitness-for-Duty AC
- ICAO FRMS leadership
- Industry/Govt. projects and collaborations

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MITRE Aviation Fatigue Research Roadmap

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Ultimate Goal . . .

Transition research into practical and effective solutions that reduce fatigue - related safety risks in aviation operations.

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Future Challenges Remain

- Need increased collaboration
- Leverage limited resources
  - data collection/sharing
  - model refinement/validation/policies
  - share best practices
- Risk based prioritization
- Operationally relevant/effective strategies

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MITRE Aviation Fatigue Research Roadmap

- Collaborate toward comprehensive fatigue risk identification, prevention, and mitigation
- Learn/share best practices from other industries (trucking, rail, marine, etc.)
- Share data not just results
  (e.g., establish a secure data repository)
- Expand knowledge/apply across settings
- Capitalize on emerging knowledge/technology

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MITRE has Created an Opportunity

- Developed/hosting this symposium
- Important/relevant stakeholders
- Collaboration, creativity, action are critical to meaningful progress
- Unique moment in a 30+ year history

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