National Transportation Safety Board

Sleep Loss in Transportation: Safety Risks and Opportunities

Mark R. Rosekind, Ph.D.
Board Member

Leadership Summit
National Sleep Foundation
April 7, 2014

Federal Agencies: Transportation

NTSB

FMCSA

FRA

NHTSA

PHMSA

DOT

MARAD

FTA

FHWA

FAA

NTSB

NTSB

1) determining the probable cause of transportation accidents

2) making recommendations to prevent their recurrence

All Modes

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PG&E/San Bruno Gas Pipeline Explosion

- 8 fatalities
- 10 serious injuries
- 48 minor injuries

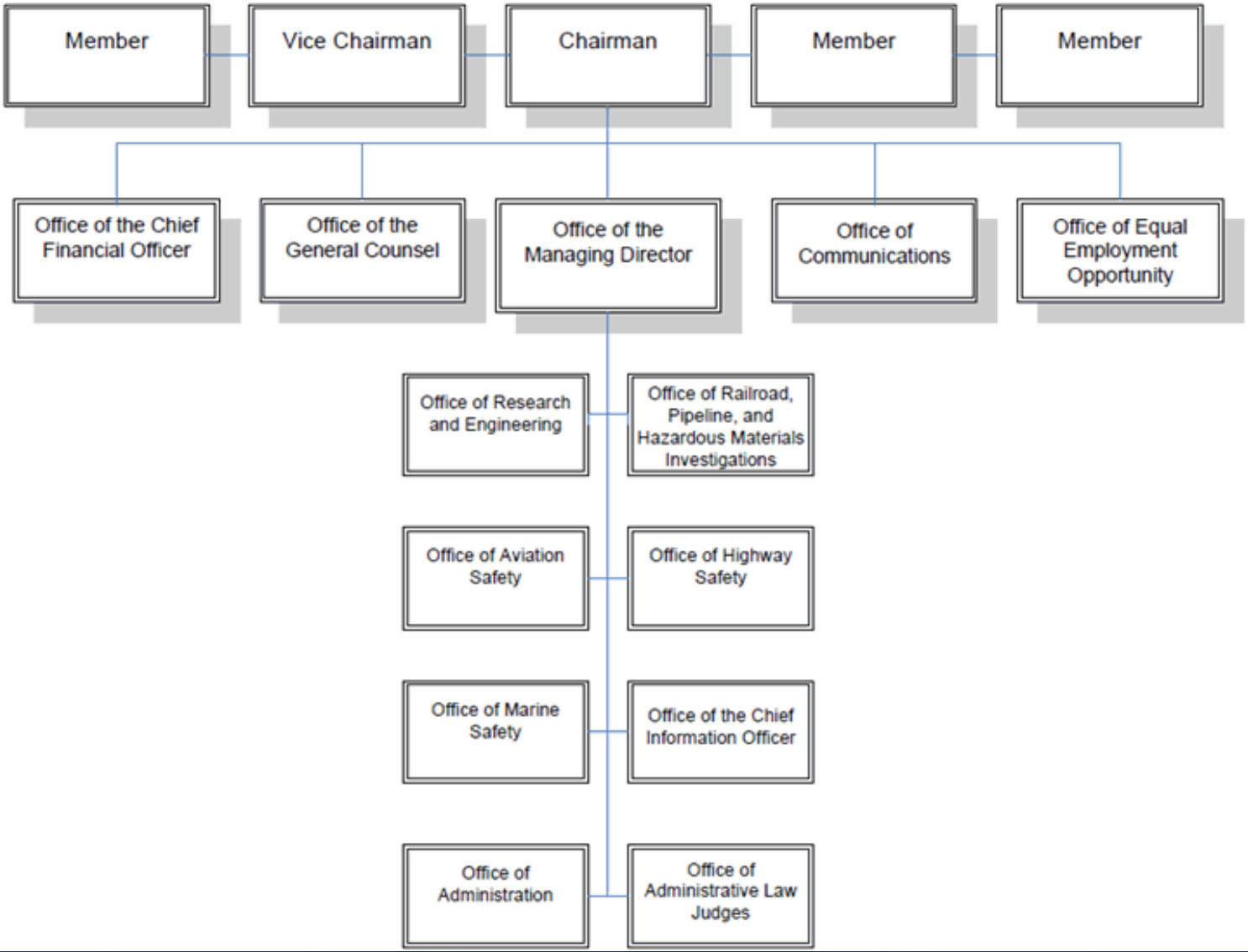
- 108 homes affected
  - 38 destroyed
  - 17 sev - mod damage
  - 53 minor damage

NTSB

Independent Federal Agency: Created in 1967

- >132,000 accident investigations
- 13,500+ safety recommendations
- ~ 2,500 organizations/recipients
- 82% acceptance rate

NATIONAL TRANSPORTATION SAFETY BOARD



NTSB: The Board

- Five Members:
  - President nominates
  - Senate confirms

Mark Rosekind
Member

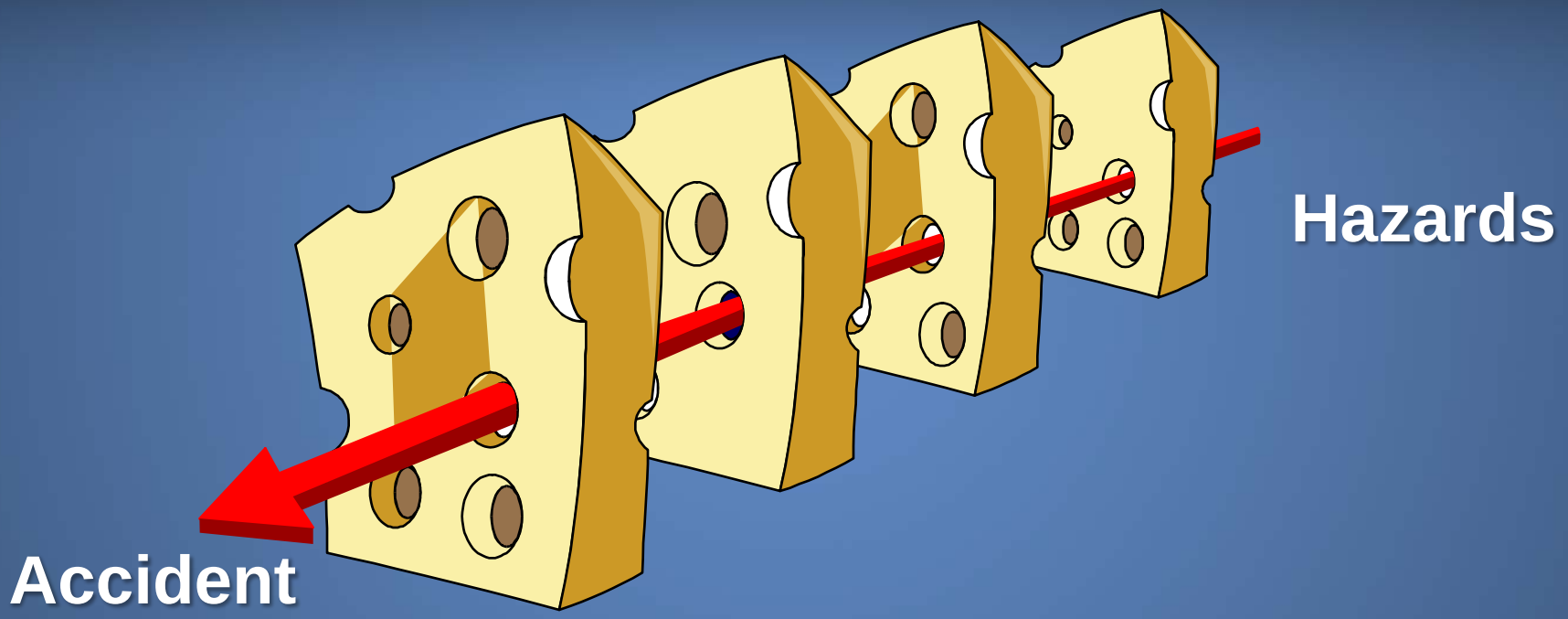
Chris Hart
Vice Chairman

Debbie Hersman
Chairman

Robert Sumwalt
Member

Earl Weener
Member

“Swiss Cheese” Model (Reason)



Successive layers of defenses, barriers, and safeguards

NTSB Characterized as:

‘moral compass and industry conscience’

NTSB Chairman Deborah A.P. Hersman

Challenges of a 24/7 Society

NTSB

Four Fatigue Factors +

- Sleep loss
- Continuous hours of wakefulness
- Circadian/time of day
- Sleep disorders
- Other considerations

Miami, Oklahoma (June 26, 2009) Fatigue Factors

- Off work for 3 weeks: day active/night sleep schedule
- 3am to 3pm shift work/drive schedule (since 1997)
- Early bedtime (2 hr phase advance in sleep time)
- Obtained min 3 hrs/max 5 hrs sleep prior to accident
- Subsequently diagnosed with mild sleep apnea

10 fatalities
3 serious injuries
2 minor injuries
5 no injuries
Ford Windstar
Always Save
Lowest Price... Everyday
Hyundai Sonata
Kia Spectra
Source: Oklahoma State Police

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. . . ."

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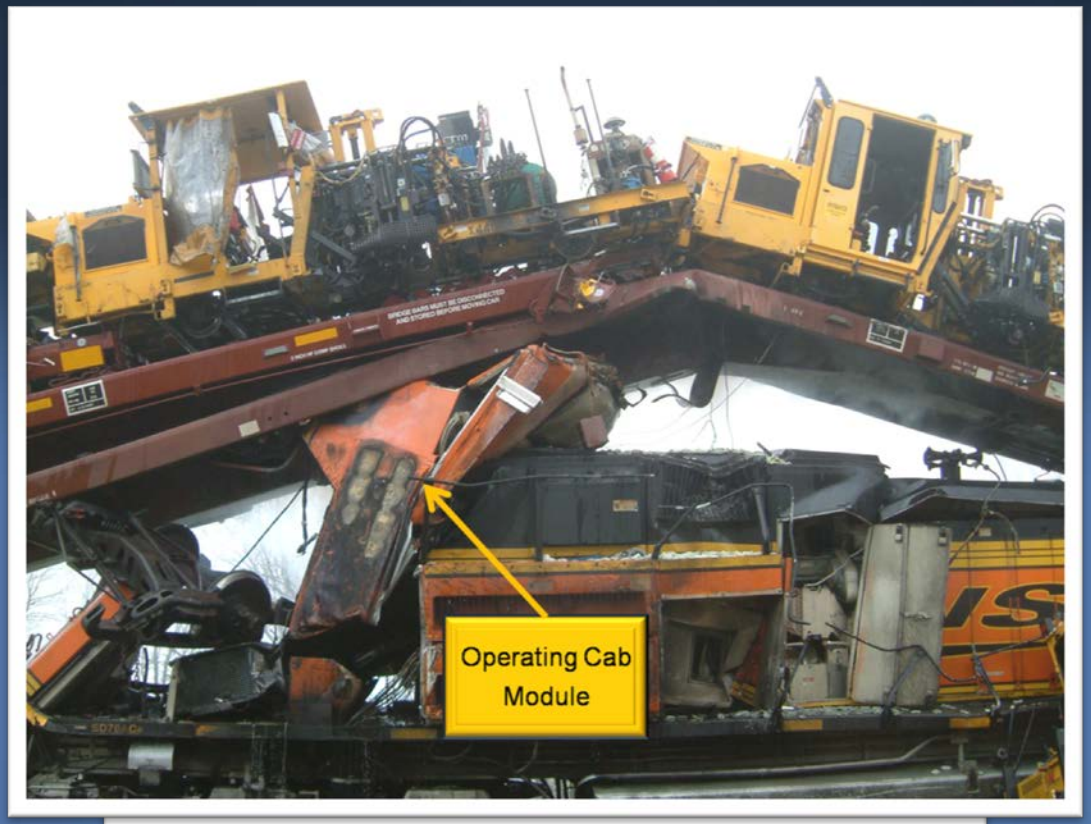
Track Path Animation

Collision Between Two BNSF Railway Freight Trains
Red Oak, Iowa
April 17, 2011
DCA11FR002



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Probable Cause (fatigue)

“. . . failure of the crew of the striking train to comply with the signal indication requiring them to operate in accordance with restricted speed requirements and stop short of the standing train because they had fallen asleep due to fatigue resulting from their irregular work schedules and their medical conditions.”

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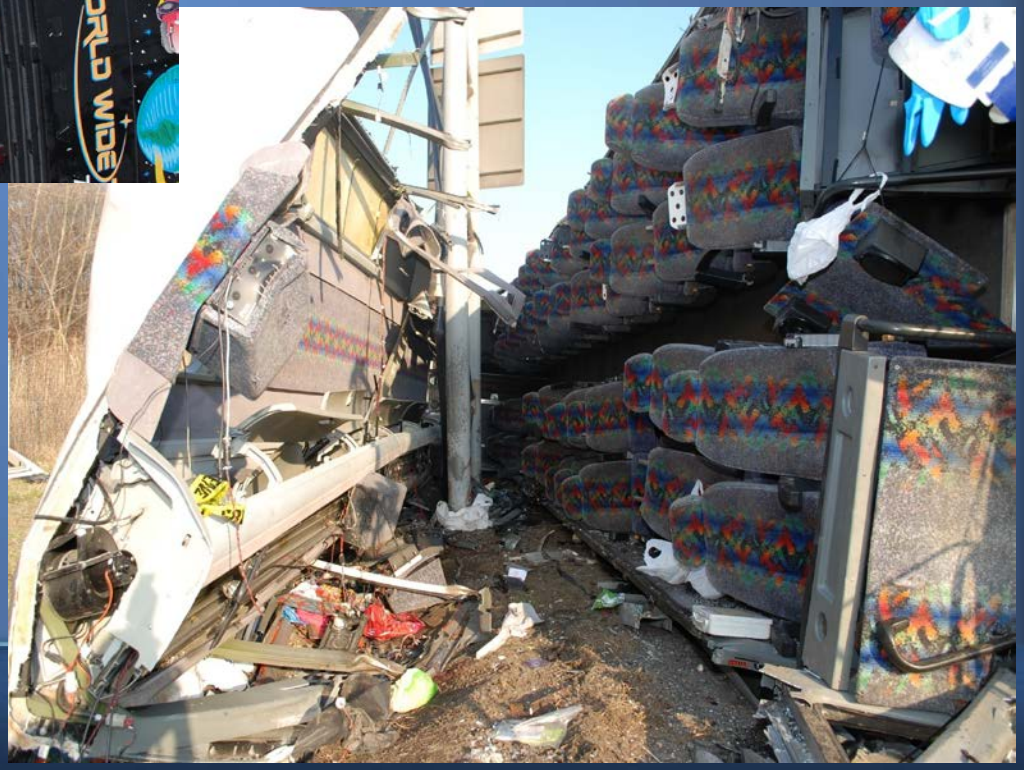
Animation of Accident Reconstruction

Motorcoach Run Off Road-Collision with Bridge Signpost

Interstate Highway 95 Southbound
New York, New York
March 12, 2011

HWY11MH005

‘Bronx Bus’, New York, NY (March 12, 2011)



15 fatalities

17 injuries

Probable Cause

"The National Transportation Safety Board determines that the probable cause of the accident was the motorcoach driver's failure to control the motorcoach due to fatigue resulting from failure to obtain adequate sleep, poor sleep quality, and the time of day at which the accident occurred."

NATIONAL TRANSPORTATION SAFETY BOARD

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Home > Transportation Safety > Most Wanted List

SHARE

MOST WANTED LIST

A program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives.
The following are ten of the current issues.

Addressing Human Fatigue

General Aviation Safety

Safety Management Systems

Runway Safety

Bus Occupant Safety

Pilot & Air Traffic Controller Professionalism

Recorders

Teen Driver Safety

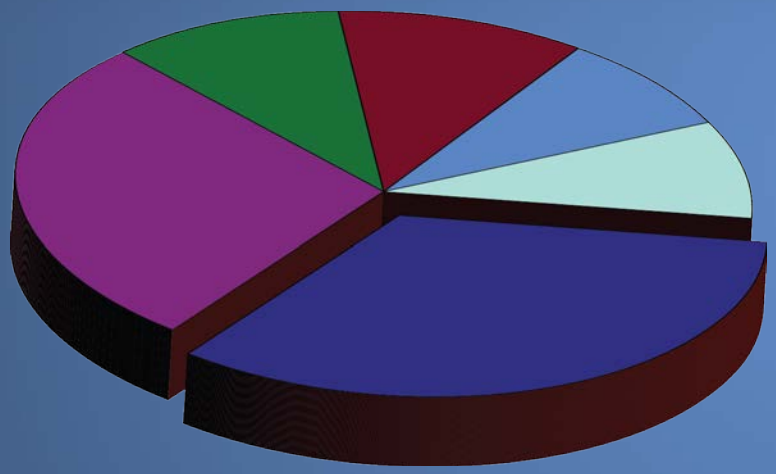
Addressing Alcohol-Impaired Driving

Motorcycle Safety

NTSB Recommendations

- MOST WANTED 1990 - 2011
- ~200 fatigue recommendations

Complex Issue:



Requires Multiple Solutions

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

NTSB Safety Recommendations: Fatigue

- 40 years ago: May 10, 1972
- “Revise FAR 135 to provide adequate flight and duty time limitations.” (A-72-55)
- Classified “Closed-Unacceptable”

NTSB Fatigue Recommendations: Education/Strategies

- Develop a fatigue education and countermeasures training program
- Educate operators and schedulers
- Include information on use of strategies: naps, caffeine, etc.
- Review and update materials

Scheduling Policies and Practices

- Day sleep, night drive, ~ 4 am WOCL

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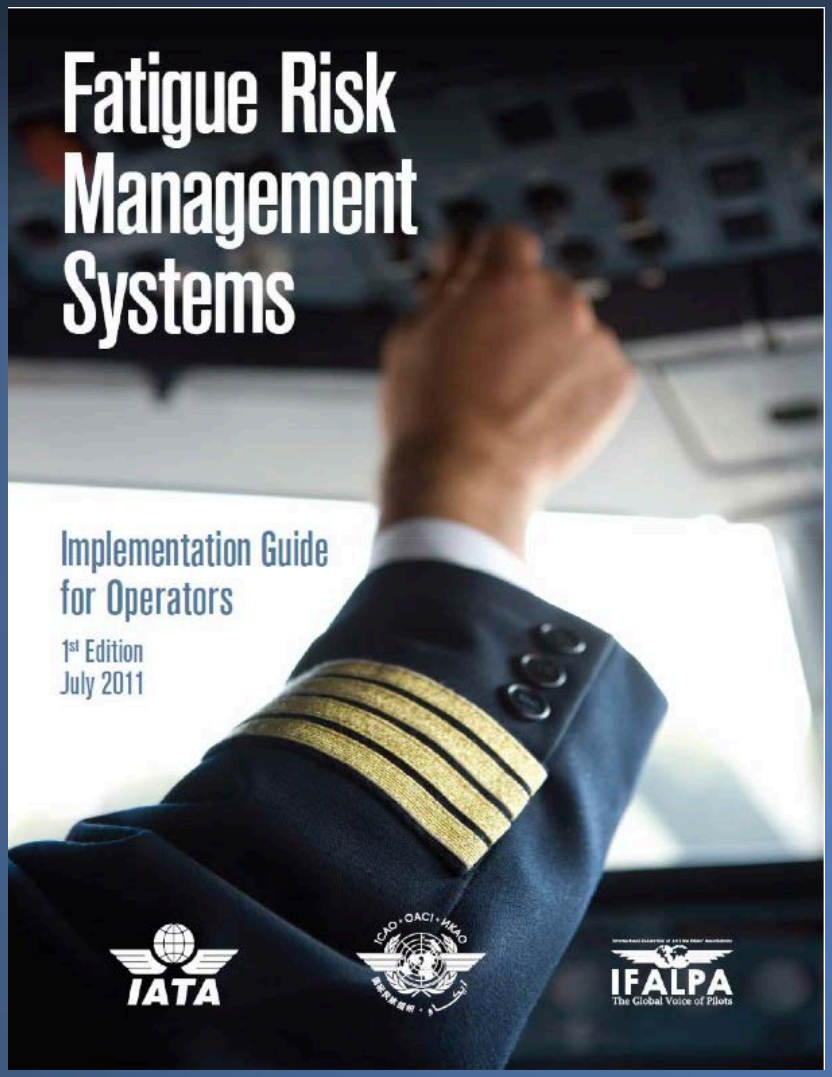
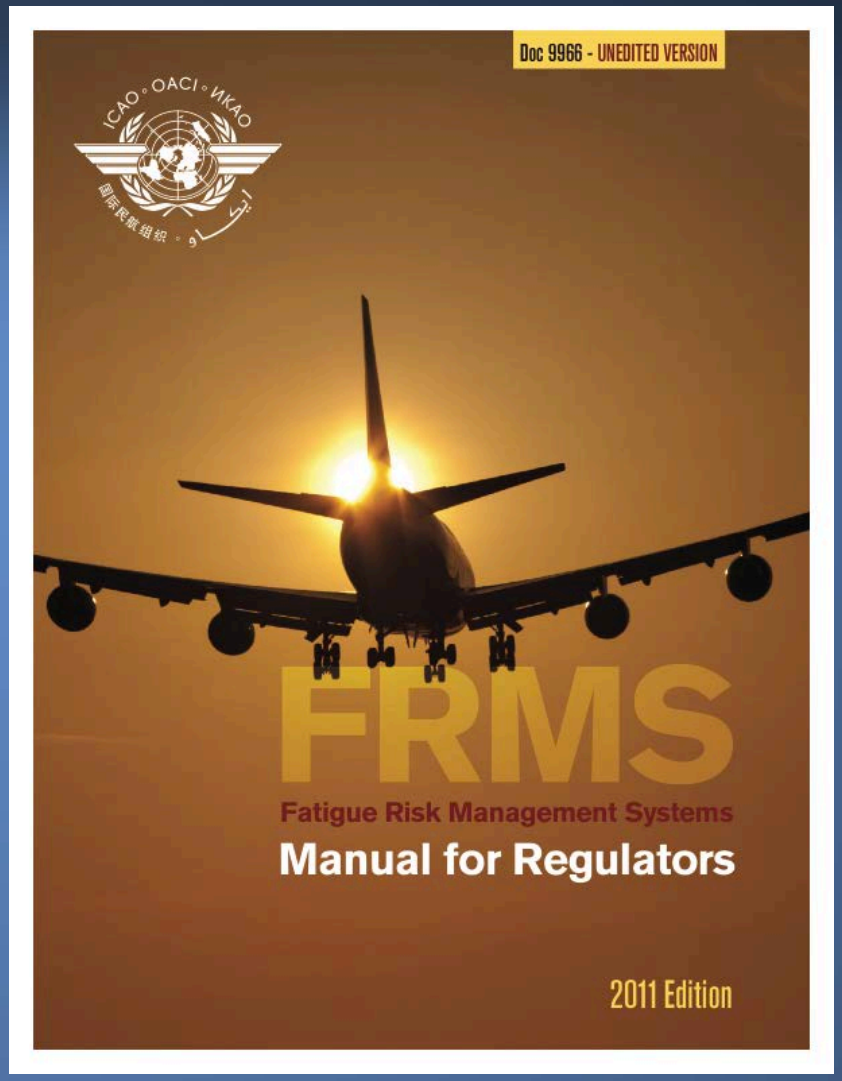
NTSB Fatigue Recommendations: Hours of Service / Scheduling

- Science-based hours of service
- Allow for at least 8 hours of uninterrupted sleep
- Fatigue mitigation strategies in the hours-of-service regulations for passenger-carrying drivers who operate during the nighttime window of circadian low
- Reduce schedule irregularity and unpredictability

Examples


Fatigue Risk Management Systems
Implementation Guide for Operators
1st Edition
July 2011
IATA
ICAO • OACI • ИКАО
IFALPA
The Global Voice of Pilots


Doc 9966 - UNEDITED VERSION
ICAO • OACI • ИКАО
FRMS
Fatigue Risk Management Systems
Manual for Regulators
2011 Edition

NTSB Fatigue Recommendations: Fatigue Management Systems

- Develop guidance based on empirical and scientific evidence for operators to establish fatigue management systems

- Establish an ongoing program to monitor, evaluate, report on, and continuously improve fatigue management programs implemented by motor carriers to identify, mitigate, and continuously reduce fatigue-related risks for drivers.

Sleep Apnea

- 360 rollover, 50/53 ejected, 9 fatalities, OSA (-CPAP)

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NTSB Fatigue Recommendations: Sleep Apnea/Health Related

- Develop standard medical exam to screen for sleep disorders; require its use
- Educate companies and individuals about sleep disorder detection and treatment, and the sedating effects of certain drugs
- Ensure drivers with apnea are effectively treated before granting unrestricted medical certification

Go! Flight 1002

- early starts, multiple segment days, sleep apnea

NTSB

1. modify the Application for Airman Medical Certificate to elicit specific information about any previous diagnosis of obstructive sleep apnea and about the presence of specific risk factors for that disorder (A-09-61)

2. implement a program to identify pilots at high risk for obstructive sleep apnea and require that those pilots provide evidence through the medical certification process of having been appropriately evaluated and, if treatment is needed, effectively treated for that disorder before being granted unrestricted medical certification (A-09-62)

3. develop and disseminate guidance for pilots, employers, and physicians regarding the identification and treatment of individuals at high risk of obstructive sleep apnea, emphasizing that pilots who have obstructive sleep apnea that is effectively treated are routinely approved for continued medical certification (A-09-63)

from the Federal Air Surgeon's

PERSPECTIVE...

BY FRED TILTON, MD

NEW OBSTRUCTIVE SLEEP APNEA POLICY

Untreated obstructive sleep apnea is a disqualifying condition for airmen and air traffic control specialists.

OSA is almost universal in obese individuals who have a body mass index over 40 and a neck circumference of 17 inches or more, but up to 30% of individuals with a BMI less than 30 have OSA. —*Fred*

Strong Industry Opposition . . .

I am…writing…to protest…
implementing a new obstructive sleep apnea policy…

FLYING

EAA, AOPA Condemn Sleep Apnea Rule

By Pia Bergqvist / Published: Nov 21, 2013

MIDWEST FLYER.COM

EAA Says FAA's Sleep Apnea Policy Would Set A Dangerous Precedent

January 26, 2014 by mwflyer

Bronx Metro North Train Derailment (12/1/13)

- 4 lives lost
- 54 injuries
- $9 million in damages
- NTSB – onging investigation

NTSB

NTSB Preliminary Report

- Completed on-scene investigation
- Estimated train speed: 82 mph at curve
- Posted speed: 30 mph
- No problems identified: signal system, train brakes, other mechanical equipment
- Tracks in derailment area: fine
- All cars on train and locomotive derailed
- Recorders sent to NTSB labs for analysis

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DAILY NEWS

NEW YORK'S HOMETOWN NEWSPAPER

Metro-North engineer 'basically nodded' just before fatal train derailment: Union official

The New York Times

Train Engineer Was Dazed Before Crash, Lawyer Says

LONG ISLAND

Newsday

Metro-North engineer 'caught himself' nodding before crash, union official says

NTSB

CTA Crash – O'Hare Airport (3/24/14)

- 32 injured
- $6 million estimated in damages
- NTSB ongoing investigation
- NTSB: Operator reported falling asleep

CTA Crash – O'Hare Airport (3/24/14)

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NTSB Preliminary Investigation

National Transportation Safety Board