More than Hours of Service: Multiple Layers of Defense for Fatigue Risk

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Institutes for Behavior Resources, Inc.

**WHO WE ARE**
- Independent, nonprofit research, services, and consulting

**OUR MISSION**
- Apply science to the improvement of human and social challenges.

**WHAT WE DO:**
*Support evidence-based safety-related policy*
- Fatigue, performance and safety
CAUSES OF FATIGUE-RELATED IMPAIRMENT
- Accumulated sleep loss
- Circadian effect on early morning hours
- Sleep inertia

FATIGUE IMPAIRS PERFORMANCE
- Reduced performance; decreased vigilance
- Impaired judgment; poor assessment of risk
- Drowsiness

HEALTH & SAFETY RISK
- Increased likelihood of accident or incident
- Less efficient operation
- Impaired health & mood
Prescriptive rules alone are insufficient

• Traditional approach to fatigue management
  – limits of duty time
  – minimum rest periods

• Limitations
  – do not address all sources of fatigue
  – can be overly permissive or overly restrictive
  – can complicate providing service
  – fatiguing sequences can be difficult to eliminate
The WMATA Fatigue Risk Management System (FRMS)

• Approach to managing fatigue risk
  – Shared Responsibility
  – Science-based
  – Data-driven
  – Continuous improvement
  – Multiple Initiatives
WMATA FRMS: How it Works

Fatigue Incident Investigation
Survey & Data Collection
Biomathematical Schedule Analysis
Scheduling Limits
Sleep Disorder Screening & Treatment
Fatigue Management Education
Quiet Rooms

Fatigue Risk Metrics

FRMS Steering Committees
Operational
Executive

Action to Mitigate Fatigue Risk

Continuous Improvement
WMATA FRMS Development

Policy & Plans
- Establish Policy & Steering Committees
- Integrate with existing safety programs

Fatigue Risk Management Initiatives
- Derive program metrics

Continuous Improvement
- Reduce fatigue-related risk
Policy and Plans

- WMATA Fatigue Risk Management Policy
  - Commitment
  - Program scope
  - Ownership, Leadership
  - FRMS initiatives
# Metrics are derived from FRMS Initiatives

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<td>Excess service in period, week</td>
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Duty Hour Limits

• Address fatigue risk factors
  – limit fatigue accumulation on duty
  – opportunity for sufficient rest

• Science-based limits
  – Modeling & best practices

• Work hour reporting systems
  – Limit exceedances by group
WMATA Investigation for Fatigue

• Establish and track
  – Could operator have been fatigued at time of incident?
  – Actions consistent with fatigue?

• Tools and education
  – Questionnaire
  – Modeling Tool
Quiet Rooms

• Opportunity to get additional sleep
• Quiet Room & Recuperative Breaks
  – Off-duty times
  – Guidelines & Code of Conduct
• Pilot & usage data
Sleep Disorders
Screening & Treatment

• Facilitate screening & support treatment

• Screening via Medical Compliance
  – CDL requirements
  – Additional safety-sensitive personnel

• Reducing barriers to sustained treatment
  – Benefits, out-of-pocket costs, patient support

• HIPAA-compliant reporting
Education, Training and Awareness

• Computer/Instructor based training
  – Fatigue Management 101, 201, 301
  – Fatigue Investigation
  – Report completed training

• FRMS intranet resource

• Awareness initiatives
  – safety meetings, calendar, Newsletter
Metrics and Tools

• Model-derived metrics:
  – Exposure to low effectiveness
  – Sleep debt accumulation
  – Estimated effectiveness at incident

• Fatigue Management Tools
  – FRMS Dashboard
  – Scheduling aids
  – Model-based schedule analysis
FRMS Dashboard

- Duty limit exceedances
- Model-based schedule analysis
  - Effectiveness
  - Sleep Reservoir
- Fatigue-related incidents
- Fatigue related training
Fatigue Investigation Modeling Tool

Biomathematical modeling of fatigue risk
- Web or server-based tool developed for FRA
- Model work history to:
  - Estimate effectiveness at time of incident
  - Identify patterns indicative of recurring fatigue risk
Other Considerations

- Secondary Employment
- Fatigue Mark Off
- Short Break Opportunities
- Data Analysis & Surveys
- Fatigue Reports
- Objective Program Review
Questions & Discussion

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