

UNION PACIFIC'S FATIGUE RISK MANAGEMENT SYSTEM (FRMS)

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Fast Facts in The USA

Miles of Track **32,300**

Employees **45,500**

Locomotives **8,500**

Freight Cars **104,700**



The largest railroad in North America

Operating in the western two-thirds of the United States

The system serves 23 states

Freight transportation

Commuter transportation in Chicago, IL



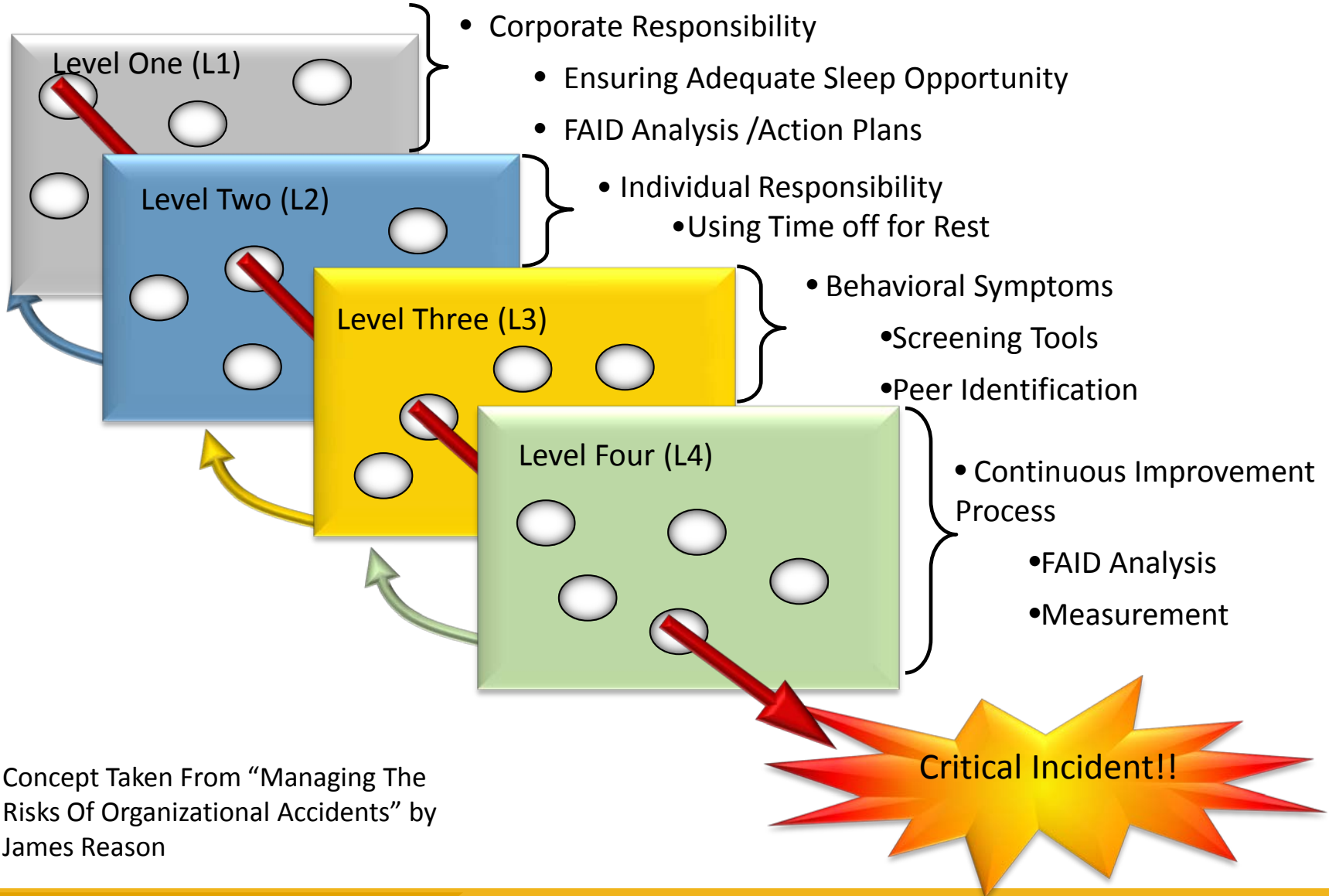
Challenges For Union Pacific

- Geographically dispersed population
- Rural locations
- Mobile population
- Employee demographics
- Thirteen unions



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Fatigue Risk Management System (FRMS) Model



Concept Taken From “Managing The Risks Of Organizational Accidents” by James Reason



Union Pacific's FRMS

- **Risk Management Model**
 - Identify, measure and prioritize risk and develop and implement controls
- **Addresses Critical Challenges**
 - 24/7 Operations & 24/7 Society
 - Unsupervised TE&Y workforce
 - Aging/new workforce
 - Unhealthy society
- **Scientifically based “toolbox” approach**



Key Elements of FRMS

- **Policy**
 - Corporate & Local Policies
- **Training and Education**
- **Ensuring adequate average sleep opportunity**
 - Company responsibility
 - Software analysis & Measurement



Key Elements of FRMS

- Ensuring employee preparedness: ensure that individuals who received an adequate average sleep opportunity have achieved sufficient sleep to ensure safe level of alertness [SLA]
 - Education on signs & symptoms
 - Education & policy regarding minimal sleep and reporting
 - Shared Responsibility partnerships with employee, labor organizations and government
- Additional Countermeasures
- Research - ongoing process of pertinent research to ensure FRMS is evidence-based.



FRMS Implementation



Fatigue Risk Management System Model

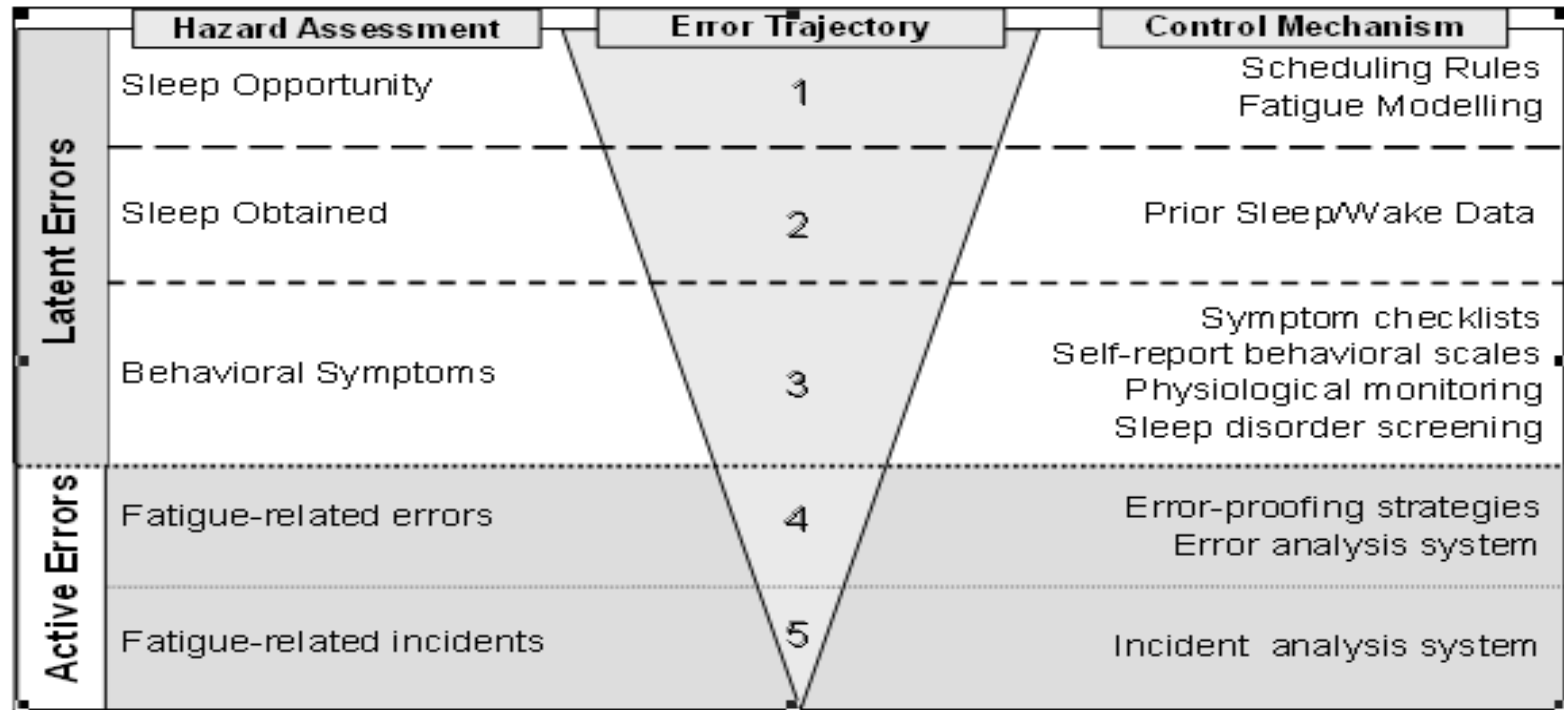


Figure 1. Fatigue risk trajectory. There are multiple layers that precede a fatigue-related incident, for which there are identifiable hazards and controls. An effective FRMS should attempt to manage each layer of risk

Level One Controls

- **10-hour Undisturbed Rest/AM Mark-Up**
- **Proactive Notification**
- **Work/Rest Cycles & Call Windows**
 - **Magic bullet mentality not justified -- comprehensive and integrated process**
 - **More than just Crew Scheduling**
 - **Example – Seattle**
 - **Example – North Platte/Marysville**
 - **Example – LA Basin**



Level One Controls

- **FAID Process**
 - **FAID Analysis -- Software package to identify the extent of any fatigue problems (i.e. locations or times of reduced average sleep opportunity)**
 - **System identification of where reduced sleep opportunity may lead to work-related fatigue**
 - **Assess whether interventions have increased sleep opportunity**
 - **Used in conjunction with the Board Game software for simulating the impact of changes at the board/pool level**
- **Evaluation done by using the following:**
 - **The time of day of work and non-work periods**
 - **The duration of work and non-work periods**
 - **Work history in the preceding seven days**
 - **The biological limits on recovery sleep**
 - **Derived from Hours of Work (HoW) data**



Fatigue Scores are Indicators Only

- Fatigue scores are indicators only of the impact of sleep deprivation.
- They are based on a statistical analysis of research performed into fatigue levels over a broad sample of population and provide guidance on the fatigue of an individual.



Level Two Controls

- Level 2 controls are designed to ensure that individuals who received an adequate average sleep opportunity have achieved sufficient sleep to ensure safe level of alertness [SLA]
- This requires a high level of shared responsibility
- Labor will play an important role in shaping the employee attitudes. Labor/management consultation will be essential
- Implementation: Employee, Management and Family education and awareness.



Level Two Implementation

- **Stage 1 - Initial Awareness**
 - Minimum Sleep/Wake Needs - 5/12 rule
- **Stage 2 - Personal Management tool**
 - Introduce Prior Sleep/Wake Model and behavioral scale
 - Used to manage personal behavior and ensure SLA
 - No reporting requirement
- **Stage 3 - Organizational Integration – Planning Stages**
 - Introduce Scoring System
 - Reporting of non-zero scores
 - Develop local decision matrices
 - Mark off



Additional Level Two Controls Proposed

- **Industry collection of US Sleep/Wake Data**
 - **Ensure Level One Models are valid**
 - **Link L1 -> L2 -> L3 frequencies to ensure evidence-based policy**
 - **Establish industry benchmarks/policy guidelines for Sleep/Wake behavior**
- **Research projects**
 - **Projects collecting Work/Rest, Sleep/Wake, Behavioral data**
 - **Kansas City [WR,SW, Actigraphy]**
 - **Des Moines/St. Paul [WR,SW]**
 - **San Antonio [Diaries, Actigraphy]**
 - **Denver [Interviews, Diaries]**



Level Three Controls

- **Reflect a general organizational shift in philosophy and policy**
 - Increased focus on employee involvement in fatigue hazard identification and self-management of fatigue
 - i.e. self and peer education leading to self assessment
 - Clear policy guidelines on managing pre-defined unacceptable levels of fatigue-related behavior)
 - Discipline vs. Peer Intervention
- **Physiological Monitoring Systems**
 - Ongoing internal technological review process
- **Self and Peer Identification of Fatigue-Related Behaviors**
 - Generic symptom and Task-Specific symptom checklists
- **Sleep Disorders Screening**
 - FRA/UP Assessment Research Project
 - Voluntary Program (Occupational Health Nurses)
 - Education and Awareness



Level Four & Five Controls

- **Identifying fatigue as a cause of errors or incidents**
 - Evidence of L1-3 data consistent with fatigue
 - Nature of incident is consistent with fatigue-related error
- **Needs to be an industry initiative to ensure level playing field**
 - UP willing to collaborate with industry initiatives
- **FAID Model and UP BoardGame Analysis**
 - Fatigue score must remain consistent or improve for scheduling modification consideration



Fatigue Hazard Analysis (FHA) Workshop

- **Evaluate fatigue-risk conditions associated with T&E at a specific location**
 - Identification of workplace tasks
 - Selection of fatigue risk severity and fatigue-risk frequency gradings
 - Development of an organizational risk tolerance boundary
 - Task specific Fatigue Threshold Levels (FTL)
- **Benefits**
 - Assistance in the identification of safe levels of fatigue for tasks with improvement actions and cost estimates that can lead to the reduction of overall fatigue-related risk
 - Lays the foundation for the Fatigue Component of the SU Safety Risk Metric and Action Plan Development

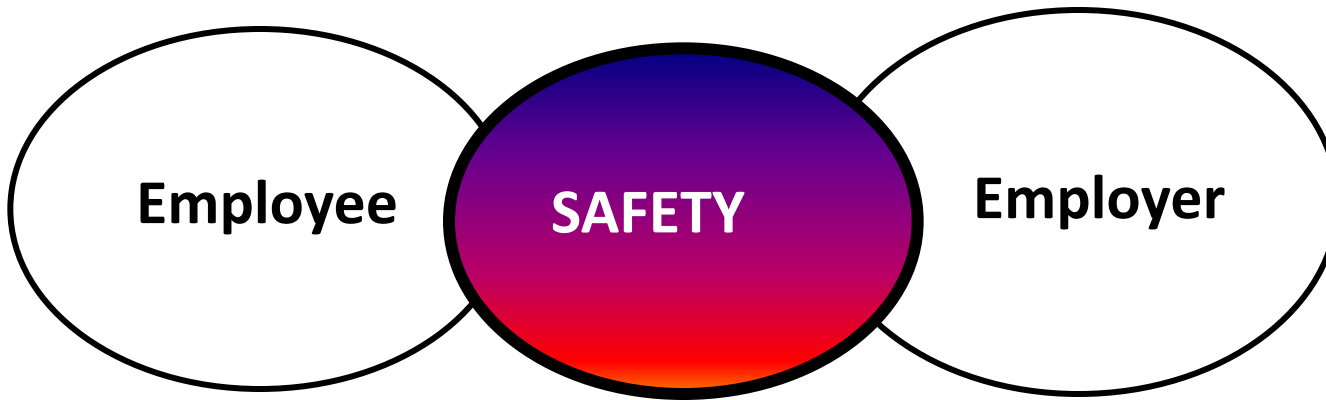


FRA Grant Support

- **Broad Agency Announcement (BAA) Phase I Award**
 - FRMS Enhancement
 - \$150,000 funding
 - 2009 – 2010
- **BAA Phase II Award**
 - Fatigue Management Education Review
 - FHA Workshops
 - \$75,000 funding
 - 2011 – 2012



Shared Responsibility of Employee and Employer



Safety is the outcome of appropriately managed risks
















Alertness/Fatigue Videos

Alertness Management Videos

Title / Description	Order Number
Sleep Basics A discussion of the main sleep basics, including, how your sleep habits affect fatigue, the circadian clock, and what happens when you lose sleep.	HP-043-99
The Program A general description of the UP Alertness Management Program and how to access information available to employees.	HP-045-99
Strategies for Living A discussion of the strategies for managing fatigue, including, good sleep habits and how your lifestyle affects your level of fatigue.	HP-046-99
Fatigue and Family Support This video explains the need for sleep and the need to be part of a family, including tips on how families can support shift workers.	HP-047-99
Sweet Dreams This video brings a lighter look to fatigue education regarding sleep disorders and what can be done about them.	HP-068-01
Sleep Deprivation A discussion about the costs of lack of sleep for the employee and lack of motivation and response. The video also touches on the costs of sleep deprivation for the company in terms of decreased productivity and absenteeism.	HP-050-00
History of Drowsy Driving This video brings a lighter look to educating people on symptoms associated with lack of sleep and increased fatigue, in conjunction with getting behind the wheel.	HP-069-01
Insomnia This video describes what to do when you are unable to fall asleep or stay asleep.	HP-077-01
Z-9 Adolescents and Sleep This video is a guide to a full discussion on adolescent sleep issues.	HP-078-2
Planned Nap Program (T&E) This video discusses the development of the planned nap program at Union Pacific for those with erratic schedules and shift work.	HP-120-08
Napping This video outlines Union Pacific's Napping Policy and gives guidelines and recommendations for napping.	HP-084-03
Sleep Disorders This video was created by the KC Southern and gives signs and symptoms of sleep disorders, as well and treatment options available.	HP-083-03



Alertness/Fatigue Brochures

<p>Alertness Management Guide </p> <p>A brief guide that provides facts about the physiology of fatigue, in addition to giving a few strategies to improve your everyday performance.</p>	PB-26111
<p>Fatigue Concerns and Myths</p> <p>This brochure addresses some common myths about fatigue and demonstrates why this issue is relevant to all U.P. employees.</p>	PB-26114
<p>Guide for Day Sleepers </p> <p>Provides suggestions for employees and family members that are designed to help employees get the most restful sleep they can during the day, at home, or while away.</p>	PB-26116
<p>Planning your Emergency Response</p> <p>The purpose of this brochure is to provide those managers and employees who must respond to unscheduled, or emergency, work activities, assistance in developing a plan of action for coping with the negative impact of fatigue before, during and after the unscheduled events.</p>	PB-26117
<p>Sleep Medications </p> <p>Offers insight on different sleep medications available as well as their associated health risks.</p>	PB-26118
<p>Project AM/PM: Alertness Management...People Matter</p> <p>Project AM/PM is a world class alertness management initiative designed to protect the health and well being of Union Pacific Railroad employees. This brochure displays a comprehensive, organization-wide commitment to managing fatigue at UPRR.</p>	PB-26190
<p>Drowsy Driving </p> <p>Designed to give an overview of characteristics of drowsy driving accidents and some things to remember before driving and while driving.</p>	PB-26191
<p>Sleep Disorders </p> <p>Describes common sleep disorders, risk factors and available resources.</p>	PB-26192
<p>Good Sleep Habits </p> <p>A variety of sleep habits can promote good sleep quality and quantity, both at home and on the road. These good sleep habits can be useful to everyone in preparing for sleep and in staying asleep.</p>	PB-26193
<p>Strategies for Living </p> <p>A discussion of the general health strategies for managing fatigue, including, diet, exercise and other helpful topics.</p>	PB-26194
<p>Fatigue and the Family </p> <p>This brochure is for all employees who work erratic hours, work long hours, travel, or just plain work hard.</p>	PB-26195
<p>Jetlag</p> <p>Provides symptoms and remedies when dealing with jetlag.</p>	PB-26201
<p>Pocket Guide to Alertness </p> <p>Designed as a quick reference for those noticing possible symptoms of fatigue and decreased alertness.</p>	PB-26202
<p>Sleep Apnea </p> <p>Displays signs, symptoms, risk factors and remedies of sleep apnea.</p>	PB-26237
<p>The Rules of Napping </p> <p>Outlines Union Pacific's Policy on napping, in addition to giving restful tips, definitions, and strategies.</p>	PB-26252
<p>Staying Alert on the Job </p> <p>Everything you always wanted to know about caffeine and its consumption, but were afraid to ask.</p>	PB-26253
<p>Insomnia </p> <p>A guide that gives you tactics for getting back to sleep and getting back to those good sleep habits.</p>	PB-26277



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