COMMERCIAL VEHICLE SAFETY ALLIANCE

CVSA®

NAFMP FRMS

North American Fatigue Management Program

For Motor Carriers

CVSA Workshop in Memphis, Tennessee

April 24, 2023

CVSA Events App

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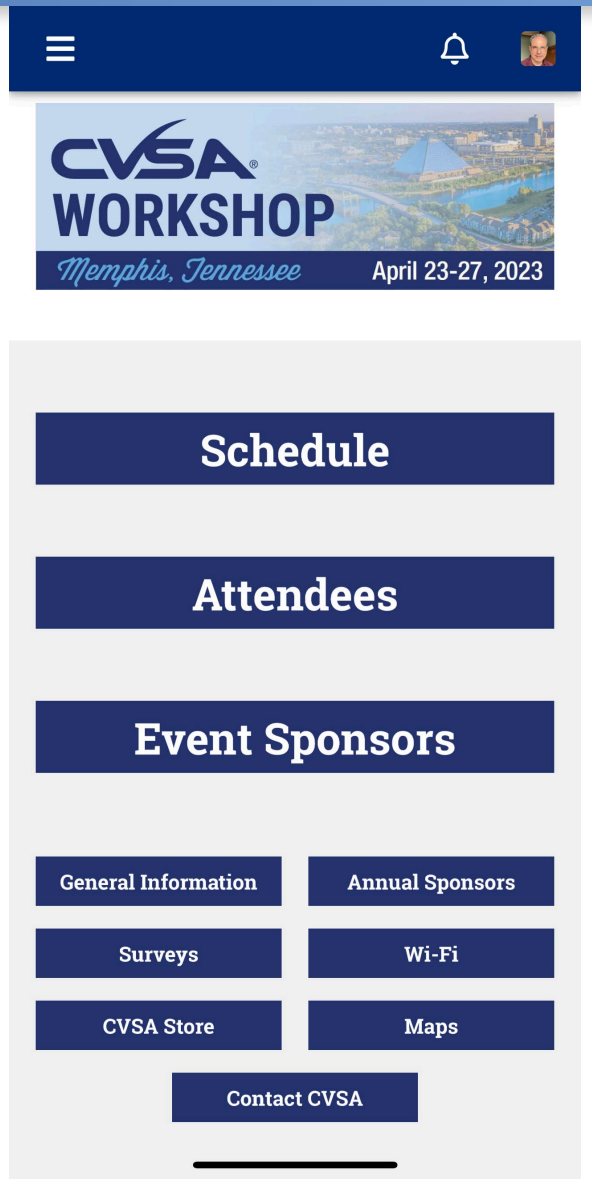

Presenter

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Poll

- Have you previously attended a CVSA Fatigue Management…
  - Seminar/webinar
  - Course
  - Information session
  - Private session

Resources

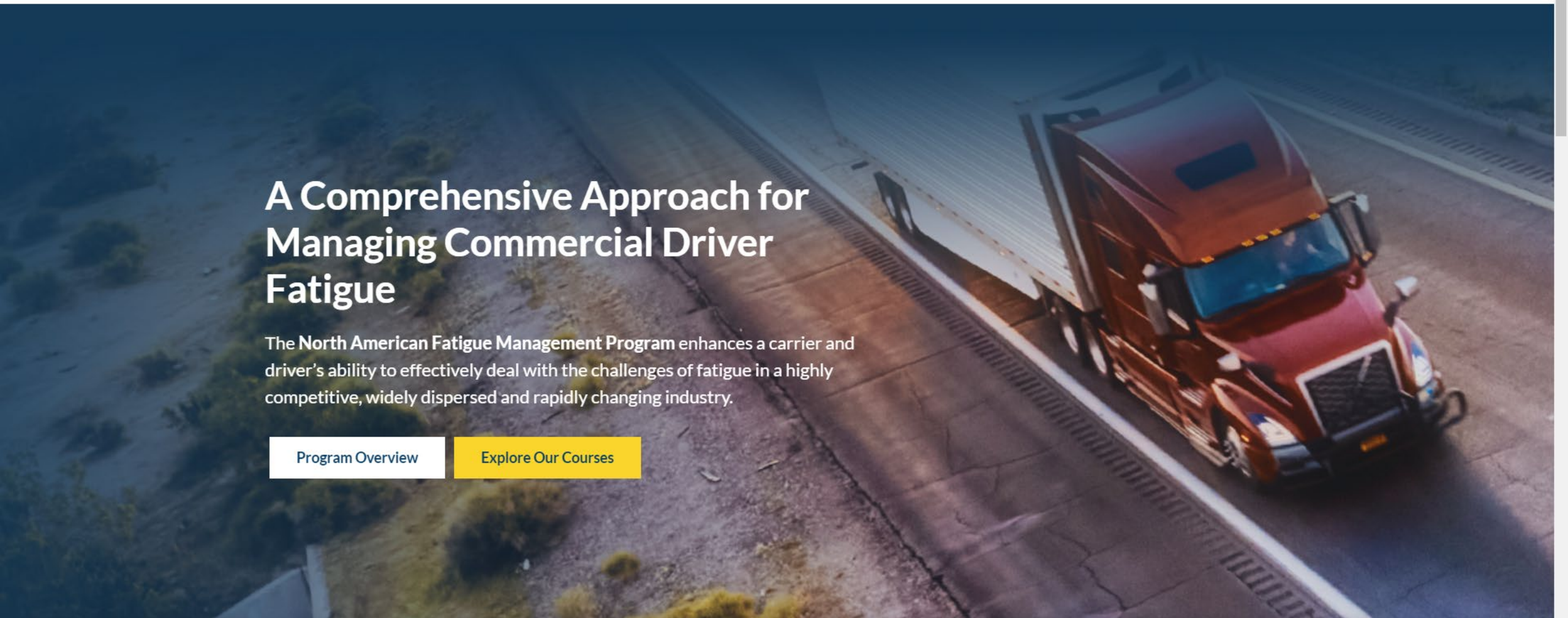
1. nafmp.org
2. Implementation Manual
3. eLearning Platform
4. Train-the-Trainer: Module 5
5. PowerPoint Presentations
6. ROI Calculator
7. Webinars – Slides/Recording & Future

nafmp.org

Français English

NAFMP
North American Fatigue Management Program

About NAFMP | Improve Driver Safety | Training | ROI Calculator | Contact | Webinars

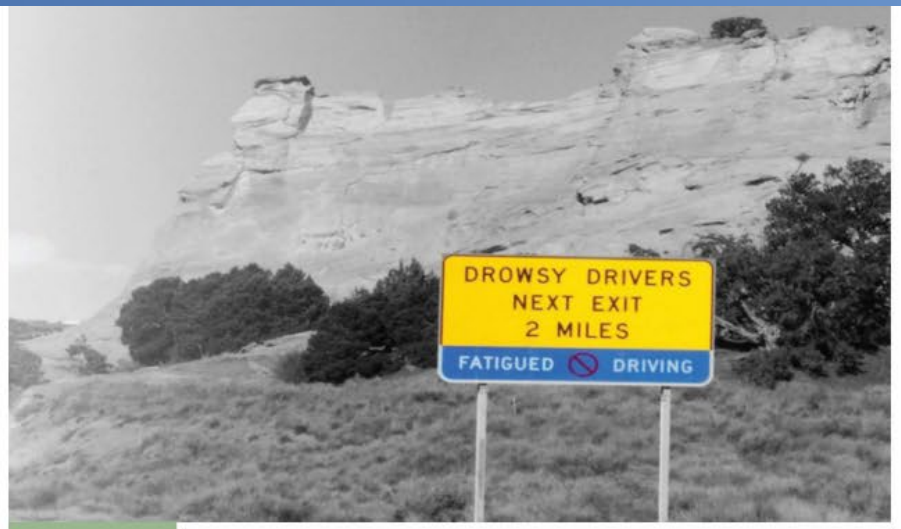


A Comprehensive Approach for Managing Commercial Driver Fatigue

The **North American Fatigue Management Program** enhances a carrier and driver's ability to effectively deal with the challenges of fatigue in a highly competitive, widely dispersed and rapidly changing industry.

Program Overview | Explore Our Courses

Implementation Manual



Guidelines and Materials to Enable Motor Carriers to Implement a Fatigue Management Program

IMPLEMENTATION MANUAL

Sponsored by the North American Fatigue Management Program

NAFMP
North American Fatigue Management Program

eLearning Platform: lms.nafmp.org

NAFMP English (en) You are not logged in. (Log in)

NAFMP North American Fatigue Management Program

Fatigue Management Community Forum

No matter your role in managing fatigue, you are welcome to join in the conversation. Questions, comments, and feedback are encouraged. Thank you for your participation. Please select here to log in or create a new free account.

Search courses

Available courses

Module 01

FMP Introduction and Overview

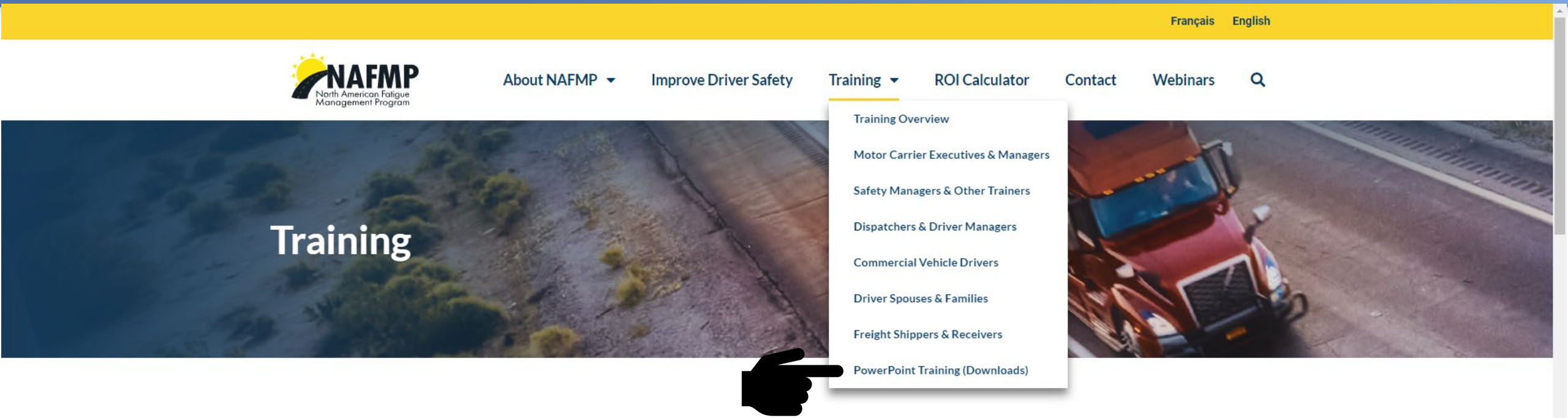
Target Audience: Carrier executives and other managers
Estimated Duration: 45 min

Module 02

Safety Culture and Management Practices

Target Audience: Carrier executives and other managers
Estimated Duration: 1.5 hours

PowerPoint Presentations



PowerPoint Training (Downloads)

NAFMP online training is a comprehensive, interactive experience. We encourage you to participate in the program via our free and self-paced e-learning system. Through the system, you'll have access to periodic check-ins, quizzes and scores. Motor carriers can also encourage their drivers and other personnel to register and complete the appropriate modules through the online system.

Access the Complete Training Program Online →

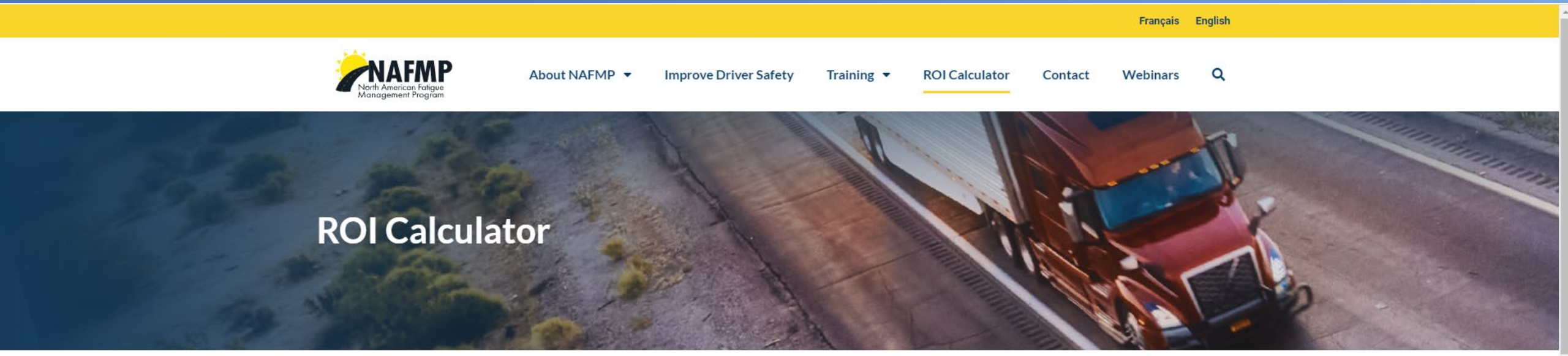
How to get started (PDF)

PowerPoints with Audio Narration

Improve Driver Safety

Reduce fatigue-related risks, reduce crashes, improve alertness and

ROI Calculator



Return on Investment (ROI) Calculator

Estimate the monetary benefits of implementing the North American Fatigue Management Program either in its entirety or in select components in a customized program, i.e., fatigue management training, sleep disorder screening and treatment, technology deployment, and scheduling tools.

Click on the links below to download the ROI Calculator and User Guide:

Calculator User Guide (PDF)

Calculator Download (Excel

Access the Complete Training Program Online →

How to get started (PDF)

Improve Driver Safety

Reduce fatigue-related risks, reduce crashes, improve alertness and promote job satisfaction.

Webinars

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NAFMP North American Fatigue Management Program

About NAFMP | Improve Driver Safety | Training | ROI Calculator | Contact | Webinars

Webinars and Courses

Register for upcoming live NAFMP webinars and courses or check out previous recordings below.

Access the Complete Training Program Online →

How to get started (PDF)

Upcoming

Download Slide Deck Now

nafmp.org/webinars/

Overview

1. Problem of Fatigue
2. Fatigue Management Program (FMP)
3. Fatigue Risk Management System (FRMS)
4. Steps to Implement FMP
5. NTSB Fatigue Crash Investigation
6. Next Steps

Poll

- Alertness and Sleep is like an on or off switch
  - True
  - False

Vigilance Spectrum

- **Delta brain waves:** Deep sleep. 1 to 4 Hertz
- **Theta brain waves:** Sleeping or daydreaming when awake. 4 to 8 Hertz
- **Alpha brain waves:** Awake and calm. 8 to 12 Hertz
- **Beta brain waves:** Awake, alert, busy, and focused. 12 to 38 Hertz
  - **Low beta waves:** Thinking. 12 to 15 Hertz
  - **Beta waves:** Performing or focusing. 15 to 22 Hertz
  - **High beta waves:** Excited or anxious. 22 to 38 Hertz
- **Gamma brain waves:** Highly alert and consciousness. 30 to 80 Hertz

Poll

- Sleep is not the single factor that determines the state of alertness
  - True
  - False

Alertness Has Supply & Demand

- Supply Factors
  - Internal individual susceptibility: circadian rhythm, amount of sleep, time of day, time awake, stimulants, other drugs, health, genes, mood
- Demand Factors
  - Task related: Time on task, task complexity, task monotony
  - Environmental: Road conditions, weather, stress (heat, noise, vibration), vehicle design, social interaction, other stimulation

Poll

- Why are fatigue related crashes hard to account?

Fatigue Crash Characteristics

- Usually single-vehicle
- Road departure
- Driver alone
- Often on monotonous roads
- Most in early morning, between 2-7 am
- Usually, serious crashes

NTSB Report

- Factors That Affect Fatigue In CMV Crashes
  - The Safety Board believes that the incidence of driver fatigue is underrepresented in FARS in general and in FARS specifically with regard to CMV drivers.
  - Research has suggested that CMV driver fatigue is a contributing factor in 30 to 40 percent of all CMV crashes.

Crash Causation: 87% Driver Related

- **Non-Performance:** Driver fell asleep, was disabled by heart attack or seizure, or physically impaired for another reason
- **Recognition:** The driver was inattentive, distracted by something inside or outside the vehicle, or failed to observe the situation adequately for some other reason
- **Decision:** Driver was driving too fast for conditions, misjudged the speed of other vehicles, or followed other vehicles too closely
- **Performance:** Driver panicked, overcompensated, or exercised poor directional control

Crash Causation Associated Factors

- 14% Inadequate Surveillance
- 13% Fatigue
- 10% Felt Under Work Pressure From Carrier
- 9% Inattention
- 8% External Distraction
- **54% Total: Crashes where diminished vigilance was involved**

Poll

- How does CMV driving make fatigue worse?

CMV Driving Worsens Fatigue

- Tight schedule to get enough sleep
- Extended work hours + commuting
- Changing work schedules
- Work/sleep periods conflict with circadian rhythm
- Limited time for rest & naps
- Unfamiliar & uncomfortable sleep locations
- Sleep disruptions
- Difficulty finding nutritious food on the road
- Limited opportunities for exercise
- Personal, work and environmental stressors

Comprehensive Approach

Benefits

- Lower Fatigue Related Crashes
- Lower Legal Liability Exposure
- Cost Reduction
  - Driver retention
  - Medical costs
  - Maintenance
- Labor force
  - Safer
  - More productive
  - Healthier & happier

Fatigue Management Program (FMP)

1. Safety Culture
   - Education & Training

2. Fatigue Risk Management System (FRMS)
   - Sound Scheduling Practices
   - Sleep Disorder Screening & Treatment Program
   - Fatigue Management Technologies

Poll

- A safety culture is nice to have but not necessary for an effective fatigue risk management system?
  - True
  - False

Effectiveness of FRMS

"While FRMS are likely to be effective, in organizations where safety cultures are insufficiently mature and resources are less available, these systems may be challenging to implement successfully"

How effective are Fatigue Risk Management Systems (FRMS)? A review

February 2022

FRMS

- What are they for?
  - Predictably and Proactively identify fatigue risks
  - Retrospectively identify factors that may have contributed to incidents
  - Improve operational processes to reduce fatigue
  - Develop strategies to mitigate factors that contribute to fatigue

- What do they do?
  - Provide tools and processes necessary to achieve fatigue-related safety objectives
  - Identify, assess, manage, and evaluate fatigue-related risks

FRMS Process Steps

- Step 1: Identify operations where FRMS processes may apply
- Step 2: Collect and analyze data
- Step 3: Identify fatigue hazards
- Step 3: Assess safety risk of fatigue hazards
- Step 4: Develop fatigue-related performance measures and countermeasures
- Step 5: Continuously evaluate the FRMS for effectiveness

Step 1: Identify Operations

- Different operations within a fleet experience varying risks of driver fatigue
- Determine whether FRMS strategies apply to entire organization or specific operations
- Identify operations that experience significant driver fatigue

Step 2: Collect and Analyze Data

- Data should drive all decisions
- Collect and analyze data to identify fatigue hazards or causes
- Look for information about restricted opportunities for rest/sleep

Step 3: Identify fatigue hazards

- Fatigue hazards are a significant risk for fleet management operations
- Three processes for identifying fatigue hazards: predictive, proactive, and reactive
- Using all three processes can help make informed decisions based on scientific principles and data

3.a Predictive Processes

- Predictive fatigue hazard identification focuses on detecting factors that negatively impact driver alertness
- This information is used to develop driver schedules and workplace conditions that minimize the future effects of driver fatigue
- Three different ways to accomplish this: previous experience, evidence-based scheduling, and bio-mathematical models

3.a.1 Previous Experience

- Management, dispatchers, and drivers have firsthand knowledge of the workplace and scheduling factors that contribute to the development of fatigue
- Use previous experiences to identify fatigue-related risks in a driver's proposed schedule
- Consider multiple sources of data and examine factors like delivery, on-time performance, violation of HOS regulations, start/stop times, and reports of fatigue levels

3.a.2 Science-Based Scheduling

- Scheduling tools can add a valuable resource in combination with information from previous experiences
- These tools use fatigue science to develop driver schedules and consider fatigue-related factors such as sleep opportunities, body clock, and other scheduling factors

3.a.3 Fatigue Science Sample Scheduling Principles

- The optimal schedule for drivers is a daytime shift with an opportunity for unrestricted sleep at night. All other schedules are a compromise of drivers' sleep
- Humans' body clocks never fully adapt to altered sleep schedules (e.g., daytime sleep necessary for night shifts)
- Shifts that overlap a driver's normal sleep pattern are expected to restrict sleep.
  - For example, drivers that normally do not have early start times or late stop times will experience restricted sleep if scheduled for an early start time or a late stop time
- A greater overlap between a shift and the driver's normal sleep schedule will result in more restricted sleep
- Nighttime shifts result in the highest self-reported ratings of driver fatigue, and additional strategies are required to help drivers maintain alertness
- Sleep debt will accumulate across days or shifts when there is an overlap between the driver's shifts and his/her normal sleep pattern. The more consecutive days with an overlap, the greater the sleep debt
- Recovering from a sleep debt requires a minimum of two consecutive nights of unrestricted sleep

3.a.4 Bio-Mathematical Models

- Develop programs or models that test how physiological and work-related fatigue factors interact to affect driver fatigue and alertness
- Replicate sleep-loss-induced laboratory studies in new scenarios to determine alertness and fatigue results
- Several bio-mathematical models commercially available, but not the sole focus of predictive fatigue hazard identification

3.b Proactive Processes

- Proactive fatigue hazard identification focuses on monitoring and analyzing reports of fatigue in the fleet operation
- Multiple data sources for fatigue identification should be used to create a more detailed and complete picture of fatigue in the operation
- Five approaches to collecting proactive fatigue hazard identification: self-reported fatigue risks, driver, dispatch, and manager fatigue questionnaires, fatigue-related driver performance reviews, review of fatigue-related CMV driving literature, and analysis of planned schedules and time worked versus actual schedules and time worked

3.b.1 Self-Reports of Fatigue-Related Risks

- Driver self-reports of fatigue risks are vital in developing an understanding of fatigue in a fleet's operation
- Self-reports offer an ideal method for drivers to provide feedback about the success of their fatigue management strategies

3.b.2 Fatigue-Related Driver Performance Reviews

- Proactive fatigue hazard identification can involve reviewing driver performance metrics related to fatigue
- Examples include the number of safety incidents related to fatigue, accidents, near-misses, and logbook violations

3.b.3 Alertness Tests

- Measures of reaction time, vigilance, short-term memory, etc.
- Psychomotor Vigilance Test (PVT) is commonly used for fatigue
- Not feasible in CMV operations while driving
- Fitness for duty test could be used before a drive or at the end of a drive

3.b.4. Driving Performance Data

- Driving performance decrements resulting from fatigue
- Lane deviations, slower steering responses, reduced response to speed changes, etc.
- Driver behavior monitoring devices can track objective performance behaviors

3.b.5 Peer Observation

- Provides a firsthand examination of fatigue-related behaviors
- Difficult to observe CMV drivers
- Team driving can help record fatigue-related behaviors
- Onboard monitoring devices provide objective measures of drivers' behaviors

3.b.6 Review of Fatigue-Related Scientific Literature

- Inexpensive option to measure fatigue-related factors
- Provides general guidance based on prior scientific studies
- Several resources available online:
  - Federal Motor Carrier Safety Administration
  - National Highway Traffic Safety Administration
  - Peer-reviewed scientific journals such as SLEEP, Accident Analysis and Prevention, Journal of Sleep Research
  - NASA Fatigue Countermeasures Laboratory
  - References section of the NAFMP Implementation Manual

3.b.7 Planned Versus Actual Time Worked

- Evidence-based scheduling practices consider fatigue-related factors
- Unforeseen circumstances can cause schedules to change
- Analyze differences between actual times worked and scheduled times worked

3.c Reactive Processes

- For identifying fatigue hazards involve responding to identified fatigue-related events
- Include incident reporting, fatigue-related accident investigations, and near-miss reporting
- Triggered by fatigue reports, crashes, near-crashes, and violations
- Designed to identify how driver fatigue may have contributed to incidents
- Goals are to identify how fatigue may have been mitigated and prevent future occurrences

3.c.1 Determining if Fatigue Was a Contributing Factor

- Driver was likely in a fatigued state
- Drivers’ actions or decisions were a cause of the crash, near-crash, or violation
- The drivers' level of fatigue was a contributing factor to the crash, near-crash, or violation

3.c.2 Information Required for Determination

- The amount of sleep usually needed for the driver to feel fully rested & alert
- The amount of sleep experienced during the 24 hours prior to the incident
- The amount of sleep experienced during the 72 hours prior to the incident
- The amount of time awake immediately prior to the incident
- Information about the driver's workload prior to the incident
- The time of day the incident occurred and if the incident occurred during the driver's normal sleep or rest time
- If opportunities were present to fully recover from sleep debt

Step 4: Assess Safety Risk of Fatigue Hazards

- There are two aspects of risk assessments: measuring the likelihood of the fatigue hazard and evaluating the severity of possible outcomes from it
- A dual assessment helps in prioritizing measures to control or mitigate identified fatigue hazards

4.a Define Risk Probability

Category	Meaning	Value
Frequent	Likely to occur many times (has occurred many times)	5
Occasional	Likely to occur sometimes (has occurred infrequently)	4
Remote	Unlikely to occur but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely Improbable	Almost inconceivable the event will occur	1

Adapted from the International Civil Aviation Organization

4.b Define Fatigue Risk Severity

Category	Meaning	Value
Catastrophic	• Multiple deaths • Equipment destroyed	A
Hazardous	• A large reduction in safety margins, physical distress, or a workload such that drivers cannot be relied upon to perform their tasks accurately or completely • Serious injury • Major equipment damage	B
Major	• A significant reduction in safety margins or a reduction in the ability of drivers to cope with adverse operating conditions as a result of increased workload or as a result of conditions impairing efficiency • Serious incident • Injury to persons	C
Minor	• Nuisance • Operating limitations • Use of emergency procedures • Minor incident	D
Negligible	• No significant consequences	E

Adapted from the International Civil Aviation Organization

4.c Fatigue Risk Assessment Matrix

Risk Probability		Risk Severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely Improbable	1	1A	1B	1C	1D	1E

Adapted from the International Civil Aviation Organization

4.d Risk Tolerability Matrix

Fatigue Risk	Assessment Risk Index	Suggested Criteria
Intolerable Region	5A, 5B, 5C, 4A, 4B, 3A	Unacceptable under the existing circumstances.
Tolerable Region	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C	Acceptable based on risk mitigation. May require management decision.
Acceptable Region	3E, 2D, 2E, 1A, 1B, 1C, 1D, 1E	Acceptable.

Adapted from the International Civil Aviation Organization

Step 5: Develop Fatigue-Related Performance Measures and Countermeasures

- Once it has been determined that a fatigue hazard requires action, appropriate controls and mitigation strategies should be selected and implemented
- It is critical to communicate these controls and mitigation strategies to relevant personnel to ensure they understand what each hazard is and how the strategies are designed to reduce fatigue hazards

5.a Sample Controls and Mitigation Strategies

- Scheduling tools/practices: NAFMP Module 9
- Cooperation with shippers, receivers and brokers: NAFMP Module 6
- Protocols for napping/resting: NAFMP Module 3
- Sleep disorder prevention, screening, and treatment: NAFMP Modules 7 & 8 and webinar recording
- Fatigue management technologies: NAFMP Module 10 & webinar recording

Step 6: Continuously Evaluate the FRMS for Effectiveness

- Data gathered should be compared to the safety performance objectives of the FMP
- Gradual decreases of fatigue should provide insight into the effectiveness of the FMP
- Dramatic decreases of fatigue should not be expected immediately
- Behavioral change requires time, and patience is needed when determining the overall effectiveness of the FMP

6.a Evaluation Determination

- If mitigation strategies perform to an acceptable standard, they should become part of the normal monitoring and evaluation of the FMP
- However, if the selected mitigation strategies do not perform to an acceptable standard, FRMS processes should be reviewed and revised and/or new approaches should be considered

6.b Can't Manage What Can't Be Measured

- To know if interventions are changing behavior, measure and track what needs to be changed
- Measuring behaviors allows them to be monitored and reviewed
- Operationally define behaviors so they can be tracked
- Measurement can be focused on the specific behavior (**process measures**) or the result of the behavior (**outcome measures**)

6.c Process Measures

- Measures that focus on the occurrence of specific behaviors
- Process measures have been found to increase the occurrence of safe behaviors in transportation
- Process measures specific to the FMP
  - Follow policies and procedures
  - Policies and procedures implemented correctly
  - Information on the FMP has been conveyed
  - Subjective perceptions and opinions of the FMP

6.c.1 Following FMP Policies and Procedures

- FMP policies and procedures have to be followed for the program to be successful
- Amount of time exercising per week vs. medical opinion of amount of exercise needed
- Percentage of safety meetings attended
- The amount of fatigue feedback given/received in a given time
- Percentage of time a continuous positive airway pressure machine (CPAP) is used (if necessary)

6.c.2 FMP Policies and Procedures Implemented Correctly

- There are a number of specific behaviors that influence if policies and procedures are implemented correctly
- The number of concerns addressed in the development of FMP policies and procedures
- The number of feedback provided by employees that indicated a resistance to FMP implementation
- The number of employees who earn FMP recognition
- GPS tracking of trucks for miles traveled, idle time, engine off time, on-duty hours, and driving hours

6.c.3 Management has Conveyed the Necessary Information

- The number of employees that understand why the FMP was implemented
- How many meetings management attended and discussed the FMP
- The number of employees that offer feedback on the FMP
- The number of individual meetings with employees to discuss the FMP

6.c.4 Subjective Perceptions & Opinions of the FMP

- Subjective perceptions and opinions of employees may indicate how well the FMP was implemented and developed
- Percentage of employees who believe:
  - Management supports the FMP
  - The FMP is a good idea
  - The policies and procedures in the FMP are fair
  - Recognition for goal accomplishment is provided
  - Their concerns were considered during development of the FMP

6.d Outcome Measures

- Sleep duration
- Sleep quality
- Alertness
- Job satisfaction
- Injuries
- Violations
- Crashes
- Sick leave days

6.d.1 Sleep Duration

- Number of hours slept in one time frame
- Number of hours slept without waking
- The longest duration of sleep
- Number of hours spent sleeping during a 24-hour period
- Did the number of hours spent sleeping meet requirements?

6.d.2 Sleep Quality

- Sleep quality can be assessed both through subjective (i.e., questionnaires) and objective (i.e., actigraphy) measurement tools
- Driver's perception of feeling rested after sleep
- Problems breathing while asleep
- Loud snoring during sleep
  - How frequently does the driver snore loudly?
- Percentage of time spent asleep while in bed
- Sleep efficiency and latency measured with actigraphy

6.d.3 Alertness

- Alertness while awake is an indicator of fatigue and sleep quality
- Frequency the driver becomes sleepy while driving
- Performance measures: lane keeping, lack of vehicle control
- Head nodding
- Eye movement
- Frequency of daydreaming or inattention
- Percent of time driver feels alert

6.d.4 Job Satisfaction

- Behavioral expressions of satisfaction
- Perceived satisfaction measured via a questionnaire
- Turnover
- Involvement in FMP related activities
- Pledged commitment to the FMP

6.d.5 Injuries

- Fatigue-related injuries should be an indicator of the success of the FMP
- Number of injuries from crashes contributed to fatigue
- Number of other injuries related to fatigue
  - Fall/slip from higher elevation
- Health-related injuries/complications associated with fatigue
  - Cardiovascular disease and impaired cognitive functioning
- Percent of injuries related to fatigue compared to injuries not related to fatigue
- Number of injury reports

6.d.6 Violations

- Safety violations should be an indicator of the effectiveness of the FMP
- Number of fatigue-related violations
  - Hour-of-service (HOS) violation
- Number of hours spent sleeping
- Percent of time using a CPAP (if required)
- Number of hours driving

6.d.7 Crashes

- Fatigue-related crashes are typically a major reason for implementing the FMP
- Number of crashes where the driver fell asleep behind the wheel
- Number of crashes influenced by drowsiness
- Number of crashes resulting from violations in HOS
- Number or percent of crashes during circadian lows

6.d.8 Sick Leave

- Fatigue can have significant health consequences for drivers
- Cause the driver to miss work
- The number of sick leave days related to fatigue should provide an indication of the effectiveness of the FMP

Poll

- What are the main components of a Fatigue Management Program (FMP)?

FMP 1: Safety Culture

- Top management buy-in
- Empowering staff and generating commitment to FMP
- Build driver trust and instill accountability
- Driver recognition
- Corporate culture change

Module 2: Safety Culture & Management Practices

1.a Education & Training

- eLearning & PowerPoint
  - Motor carrier executives and managers
    - Module 1 (Intro), 2 (Safety Culture), 7 (Sleep Disorders), 10 (Technologies)
  - Motor carrier trainers
    - Module 5 (Train-the-Trainer)
  - Motor carrier dispatchers and driver managers
    - Module 9 (Scheduling)
  - Freight Shippers, Receivers, Brokers
    - Module 6 (Role of shippers & receivers on driver safety)
  - Drivers
    - Module 3 (Driver Ed), 8 (Sleep Disorders) & 9 (Scheduling)
  - Driver Families
    - Module 4 (Family Ed)

Poll

- What are the main components of a Fatigue Risk Management System (FRMS)

FMP 2: Fatigue Risk Management System

1. **Applicability**: Operations at risk
2. **Data Collection**: Analysis
3. **Identification**: Risk determination
   - **Predictive**: Previous experience, evidence-based scheduling, math models
   - **Proactive**: Self-reported, questionnaires, performance reviews, scientific literature review, planned vs actual time worked
   - **Reactive**: Determine if fatigue was a factor in crash, near crash or violation
4. **Assessment**: Target hazards based on **probability** + **severity** = **tolerability**
5. **Development**: Measures/countermeasures to reduce/eliminate
6. **Evaluation**: Continuously monitor effectiveness of FRMS

- Implementation Manual: Chapter 4, Pages 57-74

2.a Scheduling Practices

- Sound scheduling and routing
- Shared responsibility mitigating driver fatigue in work schedules
- Regular schedules
- Forward vs backward scheduling
- Consider travel time to employment location
- Consider rests and naps during work shift
- Maximum of 16 hrs. per day or less
- Maximize benefits of scheduling tools
- Develop customized strategies for managing fatigue

Module 9 (Scheduling)

2.b Sleep Disorder Management Program

- Insomnia, narcolepsy, restless leg syndrome, sleepwalking, abnormal circadian rhythms
- Most common: Obstructive Sleep Apnea (OSA)
- Treatments can be very effective
  - Continuous Positive Airway Pressure (CPAP) Machine
  - Health and wellness behavioral changes

Sleep Disorders Management Module 7 (Carriers)

Module 8 (Drivers)

May 4 , 2022 Webinar: A Motor Carrier's Guide to Establishing a Sleep Disorders Management Program

2.c Fatigue Management Technologies

- FMTs are only one piece of the puzzle
  - Part of overall FMP to shape positive safety culture
  - Technology can reshape driving behavior leading to fewer errors
- Types of fatigue management technologies
  - Fitness for duty, performance monitoring, driver performance
- Implementation Considerations
  - Cost & ROI
  - Legal implications
  - Driver (compliance, acceptance, training)
  - Operational protocols & performance measures
- Best practices

Module 10 (Technologies)

June 9, 2022 - Webinar: The Alertness Toolkit

Step-by-Step FMP Implementation Plan

1. Assemble Steering Committee
2. Develop Policy
3. Develop Documentation Process
4. Define Roles & Responsibilities
5. Develop Implementation Timeline
6. Introduction & Awareness
7. Education & Training
8. Provide Ongoing Communication
9. Monitor & Evaluate

Implementation Manual, Chapter 3, Pages 49-56

Step 1: Assemble Steering Committee

- Responsible for development, oversight and support
- All levels of the organization, especially drivers
- Varying levels of experience
- Representative of the organization's general population
- Sample terms and responsibilities
  - Implementation Manual, Appendix B, Page 153

[Inset Company Name] Terms of Reference: FMP Steering Committee

Purpose

The Fatigue Management Program Steering Committee (FMPSC) is responsible for coordinating all fatigue management activities at [inset company name]. This includes responsibility for gathering, analyzing, and reporting on data that facilitates the assessment of fatigue among commercial motor vehicle (CMV) drivers. The FMPSC is also responsible for ensuring that the FMP meets the safety objectives defined in the FMP Policy, that HOS requirements are met, and that the FMP facilitates the management of safety risks in general.

Terms of Reference

The FMPSC is directly responsible to the VP of Safety and reports through the Department of Safety. Its membership includes at least one representative of each of the following groups: management, dispatch, and drivers.

The tasks of the FMPSC are to:

- Develop, implement, and monitor processes for identification of fatigue hazards;
- Ensure that comprehensive risk assessment is undertaken for fatigue hazards;
- Develop, implement, and monitor measures and countermeasures to manage identified fatigue hazards;
- Develop, implement, and monitor effectiveness of FMP performance metrics;
- Be responsible for the design, analysis, and reporting of studies that measure driver fatigue, when such studies are needed for the identification of hazards, or for monitoring the effectiveness of controls and mitigations;
- Ensure that all relevant personnel receive appropriate FMP education and training, and that training records are kept as part of the FMP documentation;
- Develop and maintain strategies for effective communication with all parties;
- Ensure drivers and other relevant personnel receive responses to their fatigue reports;
- Communicate fatigue risks and the performance of the FMP to top management;
- Develop and maintain FMP documentation;
- Ensure that it has adequate access to scientific and medical expertise as needed, and that it documents recommendation made by these specialist advisors and the corresponding actions taken;
- Keeps informed of scientific and operational advances in fatigue risk management principles and practices; and
- Manage effectively and be accountable for FMP resources.

The FMPSC will meet monthly. Minutes will be taken during meetings and distributed within 10 working days after each meeting. The FMPSC will present an annual budget request in [designated part of the financial cycle] and an annual report of all expenditures.

Step 2: Develop Policy

- FMP Steering Committee with input from drivers
- Needs to address
  - All elements
  - Scope: as hazards are identified, add or remove applied operations
  - Shared responsibility and accountability between management, drivers, dispatchers and others (Step 4)
  - Safety objectives: specific, motivational, attainable, relevant and trackable
  - Clearly written and signed by executive accountable
  - Clearly communicated in the organization
  - Management commitment to fatigue reporting and continuous improvement
  - Regular evaluation of FMP
  - Sample policy, Implementation Manual, Appendix C, Pages 155-157

FMP Policy Example 1 (adapted from ICAO, 2011)

[Insert Company Name] Fatigue Management Program Policy

As a commitment to the continuous improvement of safety, [insert company name] has a Fatigue Management Program (FMP) to management fatigue-related risks.

This FMP applies to all operations in [insert company name]. The FMP manual describes the processes used for identifying fatigue hazards, assessing the associated risks, and developing, implementing, and monitoring controls and mitigations.

Under this policy:

Management is responsible for:

- Providing adequate resources for the FMP;
- Providing adequate staffing levels to minimize fatigue risk;
- Providing drivers with adequate opportunities for recovery sleep between duties;
- Creating an environment that promotes open and honest reporting of fatigue-related hazards and incidents;
- Providing fatigue management training to drivers, dispatch, and other FMP support staff;
- Demonstrating active involvement in and understanding of the FMP;
- Ensuring that the fatigue risks within their area(s) of responsibility are management appropriately;
- Regularly consulting with drivers regarding the effectiveness of the FMP; and
- Demonstrating continuous improvement and providing an annual review of the FMP.

Drivers are responsible for:

- Making appropriate use of rest periods (between shifts and periods of duty) to obtain sleep;
- Participating in fatigue management training and education;
- Reporting fatigue-related hazards and incidents as described in the FMP manual;
- Complying with the FMP Policy;
- Informing their manager or supervisor immediately prior to or during work if;
    - They know or suspect they or another driver are suffering from unacceptable levels of fatigue; or
    - They have any doubt about their or another driver's capability to accomplish their duties.

Fatigue Management must be considered a core value of our business as it provides a significant opportunity to improve the safety and efficiency of our operation and to maximize the well being of our staff.

Policy authorized by:

(Signed)_____
[Insert title of accountable Executive]

Date:_____

FMP Policy Example 2 (adapted from RTA[110])

[Insert Company Name] Fatigue Management Program Policy

The purpose of this policy is to establish the requirements for managing driver fatigue in [Insert Company Name]. It is intended that this policy will reduce the risk of fatigue-related injuries and incidents in the workplace.

Scope and coverage
This policy applies to all employees, especially those whose work involves shift work, extended hours, and on-call arrangement.

Policy statement
[Insert Company Name] is committed to providing and maintaining safe systems of work for all its employees, including those drivers whose work involves shift work, extended hours, or on-call arrangements.

Fatigue is a mental or physical exhaustion that prevents a person from functioning normally and can impair safe work performance.

Fatigue can be caused by both work and non-work related factors. Non-work related factors include family responsibilities, social activities, health issues (such as sleep disorders), study commitments, and sporting commitments. Work factors include shift work, especially night shifts, working unusual shifts, and working extended hours.

While not all people respond to fatigue in the same way, fatigue can cause reduced concentration, impaired coordination, compromised judgment, and slower reaction times; ultimately increasing the risk of incidents and injuries.

Responsibilities
Managers and drivers have a responsibility to ensure that fatigue does not impact the safety, health, and well-being of themselves and others.

Under this policy:

Management is responsible for:

- Applying risk management in consultation with staff, especially in consultation with drivers;
- Ensuring systems of work that minimize the risk of fatigue, for example: reasonable rosters, reasonable overtime practices, and adequate opportunities for recuperation between shifts;
- Providing opportunities for drivers to obtain adequate rest from work;
- Monitoring workloads, work patterns, dispatch practices, and roster arrangements to ensure drivers are not placed at risk from fatigue;
- Consulting with drivers when introducing shift work or new roster systems; and
- Providing information, instruction, and training about fatigue risks to health, safety, and well-being of drivers.

Drivers are responsible for:

- Participating in risk management processes;
- Using time off from work to recuperate in order to be fit and able for the next shift;
- Participating in education and training in order to gain an understanding of fatigue;
- Avoiding behaviors and practices that contribute to the development of fatigue, and which could place themselves and others at risk; and
- Recognizing signs of fatigue that could place health, safety, and well-being of themselves and others at risk and reporting this to their manager or supervisor.

Policy authorized by:

(Signed)_____
[Insert title of accountable Executive]

Date:_____

Step 3: Develop Documentation Process

- Policies & objectives (Step 2)
- Processes and procedures
- Each party‘s accountability, responsibility and authority (Step 4)
- Education and training program description, requirements and attendance records (Step 7)
- Data, findings and recommendations, FRMS, (Step 9)

Step 4: Define Roles & Responsibilities

- Management
  - Ensuring implementation, adequate resources & adequate staffing
  - Provide drivers with adequate opportunities to recover from sleep debt
  - Creating a safety culture that supports honest reports of fatigue
  - Providing FMP education and training to all relevant employees
  - Ensuring fatigue hazards are managed or monitored
  - Regularly communicating effectiveness of FMP with drivers
  - Providing commitment to continuous FMP improvement
- Drivers
  - Choosing behaviors that reduce fatigue risk
  - Appropriately using available opportunities for rest/sleep
  - Reporting instances of fatigue or when adequate rest could not be obtained
  - Attending and participating in FMP education and training
  - Communicating with management when known or suspected that they or another driver is suffering from dangerous levels of fatigue

Step 5: Develop Implementation Timeline

- FMP Steering Committee monitors activities to follow timeline
- Timely implementation helps driver buy-in
- Timeline should be developed and adhered to
- Ensure control measures and mitigation strategies are established
- Actions promptly taken to mitigate fatigue hazards
- Commitment of management

Step 6: Introduction & Awareness

- All employees need to be informed
- Communications should consider employees needs
  - Reading levels
  - Difficulty reading English
  - Differences between daytime & nighttime shift workers
  - Long-haul versus short-haul drivers
- Communication methods based on fleet needs
  - Website, email or other electronic communications
  - Newsletters, bulletins, fliers
  - Seminars, one-on-one and group meetings
- Kickoff by Steering Committee
  - Ensure all employees know the principles, policies and procedures
  - Awareness of why the FMP is important to reduce fatigue and promote wellness
  - Kickoff celebration or meeting held at the onset of the FMP implementation
  - Support and participation will develop trust in the FMP

Step 7: Education & Training

- Core component
- All relevant personnel
- Foundation of knowledge and skills
- Fatigue basics
- Role responsibilities
- Fatigue controls and effective mitigation strategies

Step 8: Provide Ongoing Communication

- Management
  - Maintain formal & informal communication channels
  - Remain active in fatigue related discussions
  - Actively listen and address all FMP-related feedback
  - Attendance at fatigue-related meetings to demonstrate FMP commitment
    - Change or align policies and procedures
    - Recognize and acknowledge drivers' efforts
    - Provide and receive feedback with/from drivers
    - Encourage correct fatigue management behaviors
  - Face-to-face meetings
    - Messages clearly stated, timely, and based on credible evidence
    - Opportunity to hear criticism directly from drivers & address their concerns
    - Opportunity to privately provide drivers with corrective feedback outside group
    - Opportunity to praise and recognize drivers actively involved
    - Opportunity for drivers to observe enthusiasm of management and reinforce FMP as a value

Step 9: Monitor & Evaluate

- See Implementation Manual, Chapter 4, pages 57-74 and Module 2
  - Fatigue Risk Management Systems
    - Strategies on gathering fatigue-related data
- FMP should be reviewed when
  - Operational changes
  - Staffing patterns or scheduling changes
  - Fatigue indicators suggest hazards are not being reduced or eliminated
  - New technologies, tasks or equipment is added
- FMP Review
  - Controls and countermeasures working as intended?
  - Implemented as expected?
  - New fatigue hazards developed?
  - Compare occurrence of fatigue related crashes, near-crashes, injuries, violations and other related data before FMP implementation

NTSB Crash Investigation

https://www.ntsb.gov/investigations/Pages/HWY21MH008.aspx

At-rest position of the truck-tractor and Chevrolet. (Source: AZDPS with annotations by the NTSB.) Alt-text : On-scene, postcrash photo of the severely collision-damaged and burned-out remnants of the truck-tractor and the Chevrolet, seen from the right-side.

NTSB Video

- Includes animation with collision sequence of events
- Video duration: 6 minutes 20 seconds

NTSB Selected Findings

- The carrier safety culture was inadequate
- The carrier had no fatigue management program that would have reduced the risk of fatigued operation by its drivers
- The carrier's oversight of its drivers and enforcement of its own policies regarding the maximum daily and weekly on-duty hours was poor, as the crash-involved driver and several other examined drivers regularly violated those policies

NTSB Crash Cause Determination

- We determined that the probable cause of this multivehicle crash was the truck driver's failure to respond to the fully conspicuous traffic queue, likely as the result of fatigue
- Contributing to the crash was the carrier's
  - **Poor oversight of its drivers**
  - **Lack of fatigue management program**
  - **Failure to enforce its own policies, such as those regarding on-duty hours**
- All a consequence of its inadequate **safety culture**

FRMS Components

- Fatigue management policy
- Fatigue risk management procedures
- Fatigue training and education
- Fatigue reporting
- Fatigue incident investigations
- Fatigue risk management evaluations

Next Steps

1. Create an account at lms.nafmp.org to watch any NAFMP courses
2. Download PowerPoint Files at nafmp.org
3. Watch recordings of previous NAFMP webinars

Next NAFMP Webinar

Mindfulness – North American Fatigue Management Program Driver Series

May 17, 2023, 1-2 p.m. EDT

- During this interactive webinar, participants will learn about driving mindfully; choosing wisdom, compassion and generosity; and dealing with anger, pain and loss.
- CVSA Fatigue Management Specialist Rodolfo Giacoman will go over key positive behaviors for commercial motor vehicle drivers that may help them stay alert at the wheel, reduce stress and improve their health.
- Also, our featured speaker 200-hour certified yoga teacher Emily Moorhead (who is also CVSA's writer-editor) will conduct sample guided meditations that commercial motor vehicle drivers may do regularly to practice mindfulness.

Register for this webinar

Next NAFMP Course

Fatigue Management Program Roadmap

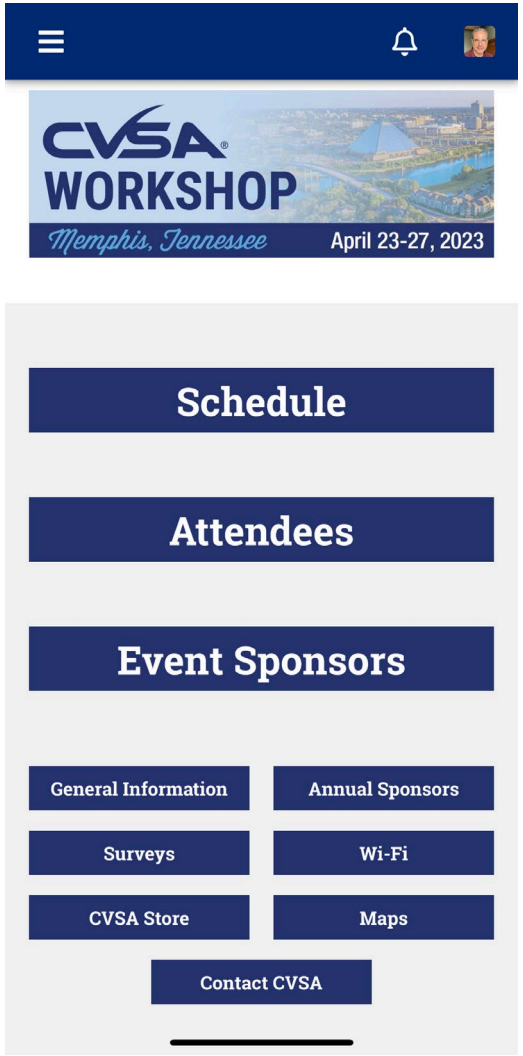
Virtual: June 14, 2023

- This North American Fatigue Management Program virtual training course will:
  - Outline the main components of a fatigue management program
  - Cover key fatigue-management educational and training elements
  - Include coursework, instruction, presentations, quizzes and individual assignments
  - Include a fatigue management program roadmap drafting and development session

Check out the Course Information and Register

Feedback

Please rate this session in the Workshop App



Any Other Questions?

Thank you!

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