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BUILD MOMENTUM

Managing Fatigue in Construction

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Agenda

8:45 AM - Login and Admin Details

- Poll Everywhere
- Internet Connection

9:00 AM - Webinar Start Time

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Poll Everywhere – Desktop Instructions

To participate in this webinar, you will need to login to Poll Everywhere.

If you have a Poll Everywhere account, please go to **https://www.pollev.com/HMAC.**

If you do not have a Poll Everywhere account, please follow these instructions:

Step 1 – Go to www.polleverywhere.com

Step 2 – Click the signup button on the top right

Step 3 – Choose "You're Participating."

Step 4 – Create a Poll Everywhere account

Step 5 – In the *join presentation* screen type **HMAC** and press join

Step 6 – Resize the browser window so you can view the webinar and polling windows

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Poll Everywhere – Tablet or Smartphone

Android Device Users

Step 1 – Download the Poll Everywhere app from the Google Play

Step 2 – Open the Poll Everywhere

Step 3 – In the menu (on the top right) select sign-up and create a Poll Everywhere account

Step 4 – At the *join a presentation screen,* type in **HMAC** and press join

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Poll Everywhere – Tablet or Smartphone

Apple Device Users

Step 1 – Open the app store on your iPhone

Step 2 – Download the Poll Everywhere app from the Apple app store

Step 3 – Register for a new account

Step 4 – Open the Poll Everywhere app and login

Step 5 – At the *join a presentation screen,* type in **HMAC** and press join

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Internet Connection

To have the best possible participation experience during the webinar, we recommend the following:

- A desktop computer with a wired internet connection will be the best possible way to participate
- If you are using a tablet or smartphone, have your Wi-Fi enabled
- If you are unable to connect to a Wi-Fi network on a tablet or smartphone, make sure you have at least three bars of cellular signal

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Thank You!
The webinar will start shortly.

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Rob Dahl, CSP, ARM

Sr. Risk & Safety Consultant

Areas of Expertise:

- Heavy/Highway
- Specialty Trades
- Mining (Surface)
- General Industry/Manufacturing
- Critical Incident Response
- Worker Wellbeing & Suicide Prevention

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Learning Objectives

- Identify risk factors that contribute to fatigue
- Recognize the impact fatigue has on productivity, quality, safety, and mental wellbeing
- Identify trends in practical reports pointing to fatigue risk in your operations
- Develop strategies to prevent, monitor, and mitigate fatigue so workers can perform at their highest potential

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Understanding Fatigue and Risk Factors

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Understanding Fatigue

Often described as extreme tiredness resulting from mental or physical exertion or illness

SYMPTOMS		
Physical	**Mental**	**Subjective**
Coordination	Attentiveness	Drowsy
Weakness	Memory	Tired
Muscle failure	Concentration	Sluggish
	Reaction time	Apathetic
	Decision-making	
	Communication	

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Leading Causes of Fatigue

1. Sleep deprivation
   - Consistent lack of sleep or reduced quality of sleep
2. Workplace factors
   - Demanding tasks, extended hours, irregular shifts, stress, working environments

Fatigued workers are more likely to suffer from physical and mental health challenges

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The Importance of Sleep

- We need at least 7 hours of sleep each night
- Sleep allows the body and mind to rest and recover
- 15-20% of the US population suffers from some type of sleep disorder
  - Sleep disorders are associated with a range of health effects including
    - High blood pressure
    - Diabetes
    - Obesity
    - Depression
    - Heart attack
    - Stroke

Source: American Academy of Sleep Medicine

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Sleep/Wake Cycle

Deepest sleep occurs around 2am

Melatonin secretion begins around 9pm

Melatonin secretion stops around 7am

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Fatigue Impairment

- The effects of fatigue are like being impaired by alcohol
- The risk of fatigue impairment increases when workers
  - sleep less than 5 hours
  - are awake more than 16 consecutive hours

Hours Awake	Blood Alcohol Concentration Equivalent
17	0.05%
21	0.08%
24	0.10%

Sources:
- JAMA 294:1025-1033, Neurobehavioral performance of residents after heavy night call vs after alcohol ingestion.
- Nature 388:235, Fatigue, alcohol and performance impairment.
- Occup Environ Med 57:649-655, Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally prescribed levels of alcohol intoxication.

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Statistics on Fatigue in the Workplace

- More than 69% of workers feel fatigued at work
- Fatigued workers lose 5.6 hours of productive time per week (250+ hours a year)
- 90% of employers felt that work-related fatigue had negatively impacted their productivity and absenteeism
- Costs employers $151 billion a year in health-related lost productivity
- Leading causes are sleep deprivation and workplace factors
- Fatigue is often a consequence of achieving productivity goals and increasing income
- An estimated 84% results in presenteeism vs absenteeism

Source: National Safety Council: "Fatigue in the Workplace: Causes and Consequences of Employee Fatigue" (2019)

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Risk Factors in Construction

- The primary risk factor leading to fatigue is related to work shifts including
  - Extended work hours
  - Nightwork
  - Shift work
  - Early start times

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Risks with Extended or Irregular Work Shifts

- Prolonged exposure to potential health hazards such as noise and chemicals
- Reduced sleep quantity and quality
- Depression and anxiety
- Smoking, alcohol and substance misuse
- Physical health problems
- High turnover with salaried positions
- Work-family conflicts may lead to presenteeism, absenteeism, divorce, turnover
- Fatigued workers have higher rates of suicidal ideation

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Other Workplace Risk Factors

- Out of town work
- Long commutes
- Ergonomic and mental demands
- Environmental conditions
- Job dissatisfaction
- Workplace culture
- Job security, layoffs
- Staffing challenges

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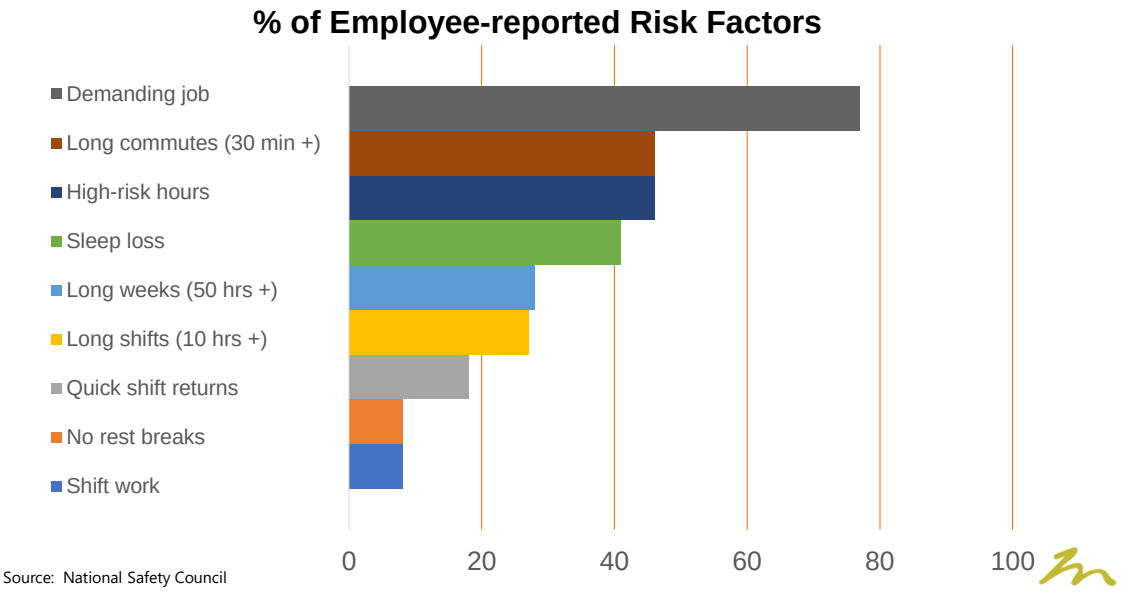
2017 National Employer and Employee Surveys on Workplace Fatigue



Source: National Safety Council

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Personal Risk Factors

- Personal or family stressors
- Diet and exercise habits
- Illness/disease
- Chronic pain
- Rx and OTC medications
- Alcohol and/or substance use
- Use of time off
- Sleep deprivation/sleep disorders

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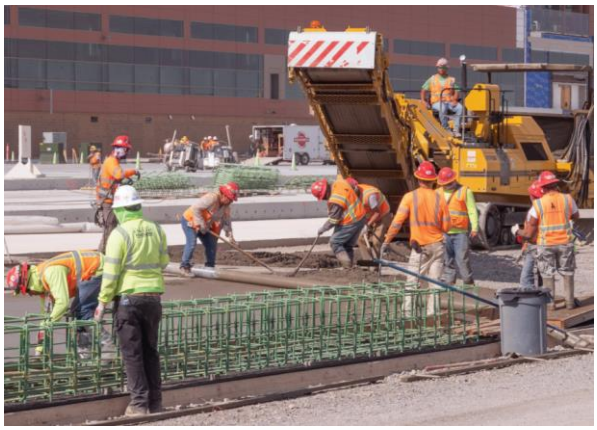
Compounding the Risk of Fatigue

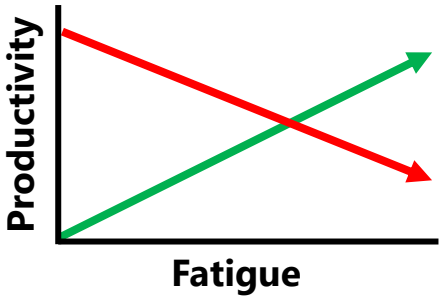
- We feel that we can make up for lost sleep later
- Excessive hours worked is viewed as a badge of honor
- Caffeine intake throughout the day
- Consuming alcohol, heavy meals, and nicotine before sleep
- Exposure to sunlight or blue light before sleep



Impact of Fatigue on Construction

Fatigue's Impact on Productivity

- Increased hours ≠ increased productivity
  - Research shows that employee output falls sharply after a 50-hour work-week
  - Working 70 hours rarely produces more with those extra 20 hours
  - Extended hours are also associated with absenteeism and turnover



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Fatigue's Impact on Quality

- Potential for non-compliance with specifications, damaging materials, faulty installation
- Rework is estimated to be 4-9% of project costs*
- Rework often presents multiple risks
- Does your company track rework?

* Source: Construction Insurance Institute (CII)

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Fatigue's Impact on Safety

- Impaired performance, focus, and decision-making
- May lead to more risk-taking
- Potential for incidents increases with consecutive hours worked
- Rework multiplies the risk
- Vehicle accidents become more likely

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Fatigue's Impact on Wellbeing

- Fatigue increases the risk of
  - Anxiety
  - Depression
  - Substance use and risk of overdose
  - Physical health problems
  - Suicidal ideation
- Existing mental health challenges may increase risk of fatigue
- Workers who put in more than 50 hours a week reported high levels of work-family conflict*

*Source: Cornell University. Industrial and Labor Relations, Institute for Workplace Studies. Overtime and the American Worker. 1999

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Identifying Behaviors and Trends Pointing to Fatigue Risk

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Measuring Fatigue is Difficult

- Multiple factors contribute to fatigue without any threshold values
- Workers' own perception of fatigue levels is often underestimated
- Most workers are reluctant to disclose their feelings of fatigue
- Wearables that measure various biometrics can supplement management efforts
- We can observe potential indicators of fatigue, if we pay attention

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Recognizing Indicators of Fatigue

- Head-bobbing, frequent yawning, and eyelids closing
- Irritability or "bad attitudes" possibly stemming from domestic issues, financial stress, conflict with coworkers, lack of sleep
- Trouble focusing or recalling instructions, conversations, or tasks
- Having difficulty solving problems
- Lack motivation or enthusiasm to perform tasks
- Uncharacteristically making errors or poor choices
- Frequent headaches, illnesses, or calling in sick more often

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Assessing Worker Readiness

- Observe workers as they show up to work
- Have informal check-in conversations with individuals
- Conduct daily work planning meetings
- Incorporate warm-up activities to ease into tasks and enhance alertness
- Do a quick PPE check
- Encourage workers to disclose any injury or health issues hey might be experiencing
- Ensure workers can feel safe in reporting if they are not feeling ready for work

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Analyzing Shift-Related Metrics

- How much is too much?
- Establish a model associated with higher likelihood of fatigue levels
- Work schedules can provide indirect evidence of potential fatigue
- Develop a system to track and monitor an individual's/crew's time worked

Shift-related metrics to consider:

- ✓ Length of shift
- ✓ Hours worked per week
- ✓ Hours of overtime
- ✓ Number of consecutive days worked
- ✓ Hours off between shifts
- ✓ Hours off between consecutive days worked
- ✓ Hours off between transition from day/night shifts
- ✓ Hours scheduled vs hours worked

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Strategies for Managing Fatigue

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Leadership Commitment

Effective fatigue management begins with demonstrating leadership's commitment to

- Creating a supportive culture
- Balancing workloads and implementing better work schedules
- Providing supervisor and employee training and education
- Creating supportive physical environment
- Monitoring fatigue and worker readiness
- Providing meaningful interventions

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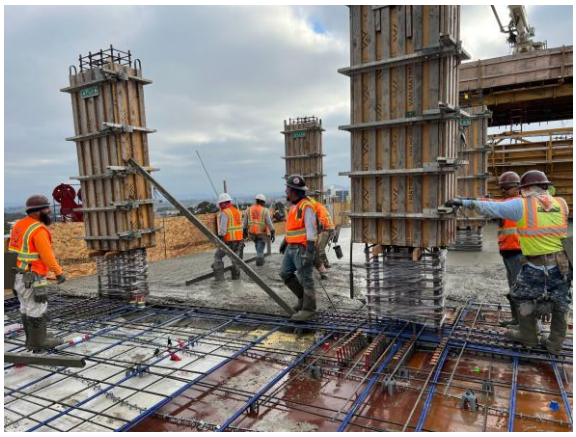
Creating a Supportive Workplace Culture

- Prioritizes wellbeing and the opportunity to perform at the highest level
- Discourages work-related activities during off hours
- Invites employees to
  - report subjective fatigue
  - ask for help when needed
  - share ideas
  - admit mistakes
- Removes fear of judgement or retaliation



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Implementing Better Work Schedules

- Balance workloads and staffing
- Set limits on daily and weekly work hours
- Limit the number of consecutive days worked
- Avoid rapid shift changes
- Consider using a predictable rotating shift schedules
- Schedule critical tasks during peak levels of alertness
- Plan for periods of peak workload
- Rotate time off/weekends off

	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	1-Sep	2-Sep	3-Sep	4-Sep	5-Sep
Names	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN
Ryan	OFF	X	X	X	X	X	X	OFF	X	X	X	X	X	X	OFF
Joe	OFF	OFF	OFF	X	X	X	X	X	X	OFF	X	X	X	X	OFF
Tate	OFF	X	X	X	X	X	X	OFF	X	X	X	X	X	X	OFF
Paul	OFF	X	X	X	X	X	X	OFF	X	X	X	X	X	X	OFF
Hunter	OFF	X	X	X	X	X	X	OFF	X	OFF	OFF	OFF	OFF	OFF	OFF
Ryan	OFF	X	X	X	X	X	X	OFF	X	X	X	X	X	X	OFF
Jesse	OFF	X	X	OFF	X	OFF	HSTGS	X	BNGDS	BNGDS	BNGDS	BNGDS	OFF	CLDSP	OFF

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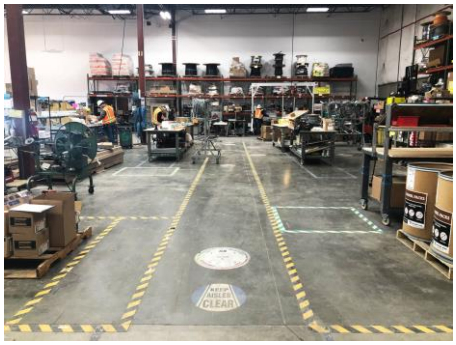
Improving the Physical Environment

- Lighting
- Temperature/humidity
- Ventilation
- Vibration
- Housekeeping
- Workflow



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Provide Meaningful Interventions

- When indicators of fatigue are observed or anticipated, prepare meaningful relief measures
  - Encourage a short break in a designated area
  - Offer water and healthy snacks
  - Rotate workers to a different task that is less monotonous or physically demanding
  - Temporarily reduce the task load
  - Adjust the work schedule
  - Provide more frequent monitoring and follow up

- In extreme cases, consider sending employee home and providing transportation

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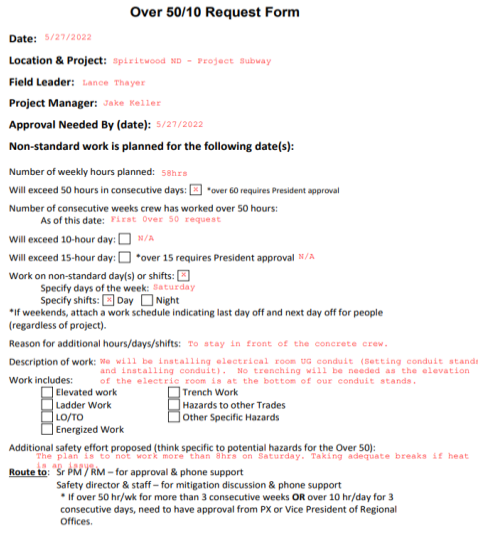
Mitigation for Excessive Overtime

- How do <u>you</u> define it?
- Establish exception process for planned/unplanned excessive overtime
  - Require additional planning and oversight
  - Incorporate additional rest breaks
  - Rotate repetitive or strenuous work tasks
  - Consider hot meals, hotels, additional toilets, designated parking near the site
  - Discourage driving after excessive shift length – offer transportation or hotel
  - Establish minimum time off after shift



Over 50/10 Request Form

Date: 5/27/2022

Location & Project: Spiritwood ND – Project Subway

Field Leader: Lance Thayer

Project Manager: Jake Keller

Approval Needed By (date): 5/27/2022

Non-standard work is planned for the following date(s):

Number of weekly hours planned: 58hrs

Will exceed 50 hours in consecutive days: [X] *over 60 requires President approval

Number of consecutive weeks crew has worked over 50 hours:
As of this date: First Over 50 request

Will exceed 10-hour day: [ ] N/A

Will exceed 15-hour day: [ ] *over 15 requires President approval N/A

Work on non-standard day(s) or shifts: [X]
Specify days of the week: Saturday
Specify shifts: [X] Day [ ] Night
*If weekends, attach a work schedule indicating last day off and next day off for people (regardless of project).

Reason for additional hours/days/shifts: To stay in front of the concrete crew.

Description of work: We will be installing electrical room UG conduit (Setting conduit stands and installing conduit). No trenching will be needed as the elevation of the electric room is at the bottom of our conduit stands.

Work includes:
- [ ] Elevated work
- [ ] Ladder Work
- [ ] LO/TO
- [ ] Energized Work
- [ ] Trench Work
- [ ] Hazards to other Trades
- [ ] Other Specific Hazards

Additional safety effort proposed (think specific to potential hazards for the Over 50):
The plan is to not work more than 8hrs on Saturday. Taking adequate breaks if heat is an issue.

Route to: Sr PM / RM – for approval & phone support
Safety director & staff – for mitigation discussion & phone support
* If over 50 hr/wk for more than 3 consecutive weeks **OR** over 10 hr/day for 3 consecutive days, need to have approval from PX or Vice President of Regional Offices.

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Investigating the Role of Fatigue in Incidents

- Interview witnesses and involved individuals to gather information about their state of mind, alertness, and overall well-being
- Examine work schedules
- Inquire about sleep patterns, nutrition, hydration
- Check if the sufficient rest breaks/mandatory break periods were adhered to
- Inquire about the use of medications, drugs, or alcohol that might affect sleep quality or alertness
- Identify any environmental factors
- Analyze the complexity of the task and overall workload

Shift and Sleep Pattern Data

- ✓ Time of incident
- ✓ Shift duration
- ✓ Shift pattern, consecutive shifts worked
- ✓ Number of hours awake
- ✓ Number of hours of sleep in past 24 hours
- ✓ Indicate if incident occurred during
  - ❑ Normal operations
  - ❑ Extended shift
  - ❑ Outage/turnaround/shutdown

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Closing Thoughts

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There is no "One Size Fits All"

- The biggest challenges in managing work-related fatigue are:
  - Our attitudes that perpetuate long work hours
  - Our beliefs and behaviors regarding sleep
  - Wide variability of fatigue-related factors among contractors and individuals

Source: Consulting Psychology Journal: Practice and Research: "Can't Sleep, Won't Sleep: Exploring Leaders' Sleep Patterns, Problems, and Attitudes" (2017).

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Best Practices for Managing Fatigue

- Let your employees know you recognize the risk and want to do something about it
- Create an environment where workers can disclose sleep and fatigue concerns
- Ask your workers what they need to reduce their risk of fatigue
- Make conscious efforts to assess worker readiness
- Improve the physical work environment – lighting, temperature, humidity, noise, vibration, workflow
- Evaluate current productivity and efficiencies for normal work shifts
- Implement thoughtful shift scheduling and track shift-related metrics

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Best Practices for Managing Fatigue (continued)

- Be mindful of changing workloads and staffing levels
- Investigate unscheduled absences – is fatigue or wellbeing a factor?
- Consider the role fatigue may have in incident causes
- Implement employee wellness programs
- Provide sleep education resources and sleep disorder screening
- Include fatigue risk as an agenda item in meetings throughout the duration of a project

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Recap of Learning Objectives

- Identify risk factors that contribute to fatigue
- Recognize the impact fatigue has on productivity, quality, safety, and mental wellbeing
- Identify trends in practical reports pointing to fatigue risk in your operations
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Thank You.

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