City Safe

A Guide To Assist In Training Employees About:

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Worker Fatigue & Shoring Safety

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City Safe is a publication of the League of Kansas Municipalities and the Kansas Municipal Insurance Trust for the purpose of educating and informing cities about loss control methods and risk management. Contents herein are not intended to provide specific legal or medical advice. Readers should seek advice on specific concerns from a qualified professional.

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Since the invention of the light bulb and the Industrial Revolution, modern society has evolved to rely increasingly on 24-hour operations in many diverse settings, including health care, safety (police, fire, and EMS), and sanitation. The health, safety, and economy of the United States are dependent upon meeting these around-the-clock needs. Furthermore, the requirement for 24-hour operations (police, fire, and EMS) will grow as the United States competes in the 24-hour global economy. Functioning on a 24-hour basis poses unique physiological challenges to humans that can directly affect waking performance, productivity, and safety. Acknowledging and managing these physiological challenges can promote performance, productivity, and safety in 24-hour operations. Ignoring these factors can lead to decrements in human capability and to the potential for incidents and accidents that can result in tremendous societal and individual costs.

Humans are hard-wired with a genetically determined biological need for sleep and with a circadian pacemaker that programs us to sleep at night and to be awake during the day on a 24-hour schedule. Twenty-four hour operations challenge the basic physiological principles. Shift work, altered and changing work schedules, crossing time zones, long hours of continuous wakefulness, and sleep loss can create sleep and circadian disruptions that degrade waking functions. On an individual basis, this translates to fatigue and sleepiness while driving, monitoring equipment, operating heavy equipment, performing medical procedures; into degraded vigilance and decision-making; and into a wide-range of other performance effects that can erode the safety margin in operational settings.

Worker fatigue cuts down on worker productivity and leads to a higher rate of on the job accidents. According to a study that the United States Air Force conducted, “Experts consensus says: Fatigue is the largest identifiable and preventable cause of accidents in transport operations (between 15-20% of all accidents); surpassing that of alcohol or drug related incidents in all modes of transportations. Official statistics often underestimate this contribution.” Experts agree that an employees’ ability to concentrate and perform is impaired when they do not receive the required amount of sleep needed by the body. Fatigue can also contribute to short-term illnesses, and long-term health care problems such as heart disease and digestive disorders.

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Strategies for managing fatigue are divided into policies that can be implemented at the workplace and changes that individuals can make in their personal behavior.

Fatigue at Work

Fatigued city workers will not perform as well, will be less productive and more likely to have accidents and injuries. Fatigue affects one's ability to think clearly. City employees who are fatigued may not be as good at recognizing their own level of impairment, and can be unaware that they are not functioning at their best.

Fatigue as a Hazard

i) A situation where a person's behavior may be an actual or potential cause or source of harm to themselves or another person; and ii) without limitation, a situation described in subparagraph (i) resulting from physical or mental fatigue, drugs, alcohol, traumatic shock, or another temporary condition that affects a person's behavior. Fatigue can only be effectively managed if both individuals and organizations work together. As with other workplace hazards, you as an employer, need to share the management of fatigue with your employees, especially because it involves factors both inside and outside of work. City employees have a responsibility to arrive fit for work and to behave safely in the workplace. This includes arriving at work as well rested as possible, and understanding and managing fatigue-related risks in the workplace.

- Sleep is the most effective countermeasure of fatigue, there is no way around it. The average adult needs roughly eight hours of sleep for utmost performance; some people need a little more sleep; others need a little less. Shorter sleep or disrupted sleep produces a *sleep debt*. One's body is set to have so many hours of sleep each day. If you do not get your body's allotted amount of sleep, then one is behind the curve. *You cannot train yourself to get by on less sleep*. Bodies are made to have a certain cycle of stimuli and recovery. Without regular sleep, our bodies eventually wear down, leading to fatigue and mistakes.

- To supplement the effects of a good night's sleep and to help maintain a sharp mental edge during the drowsy period of one's day, physically move around and/or stand up whenever you can; make the temperature cooler than usual; turn up the volume on the radio; and simply eat a high-protein snack rather than sugar and fatty foods.

- A temporary remedy for unavoidable sleep loss is caffeine. When adequate sleep is impossible, caffeine can help mitigate sleepiness. Effective caffeine doses range from 200-600 mg. and should be limited to fewer than 1,000 mg. per day. It takes about an hour for the effects of caffeine to start working, and the effects will last about four hours, so consuming caffeine too close to bedtime can cause sleep disturbances, thus perpetuating the lack-of-sleep cycle. The tolerance to caffeine usage develops quickly.

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Tips for Employers to Manage Fatigue

To manage fatigue, you need to consider both work and non-work factors.

Work wise, look into:

- Job demands – consider workload and breaks, shift length, and type of work.
- Work organization – trip scheduling, work predictability, and the pay system.

And individual factors, for example:

- Human biology – each individual's sleep pattern, body clock, health, and age.
- Life outside work – family and friends, social commitments, commuting, and standard of living.

There are no magic bullets, but you can help lower the risk of your workers becoming fatigued at work by:

- Develop a ***Fatigue Management Plan*** or a policy in consultation with your employees.
- Help people stay alert by minimizing or eliminating the time that they spend working on their own.
- Confine higher risk activities to times outside the daily body clock low points, or to times when two or more people are present.
- Manage overtime processes to take account of previous work and future scheduled work.
- Keep a record of incidents, accidents, and near misses and use this information to look at factors around how the work is organized and the time of day.
- Determine shift length based on the physical and mental demands of work.
- Ensure lighting is effective, premises are well ventilated, and temperatures are not extreme.
- Recognize that fatigue can affect everyone at your worksite regardless of their role.
- Encourage workers to talk about any fatigue problems while at work and provide systems to support them.
- Provide rest facilities, kitchen facilities, and access to drinking water.

SHORING SAFETY

Excavation and trenching are among the most hazardous construction operations. OSHA defines an excavation as any made-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. A trench is defined as a narrow underground excavation that is deeper than it is wide, and is no wider than 15 feet.

Dangers of Trenching and Excavation

Cave-ins pose the greatest risk and are much more likely than other excavation related accidents to result in worker fatalities. Other potential hazards include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment. Trench collapses cause dozens of fatalities and hundreds of injuries each year.

Protect Yourself

Do not enter an unprotected trench! Trenches five feet deep or greater require a protective system unless the excavation is made entirely in stable rock. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered engineer.

Protective Systems

There are different types of protective systems. Sloping involves cutting back the trench wall at an angle inclined away from the excavation. Shoring requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins. Shielding protects workers by using trench boxes or other types of supports to prevent soil cave-ins. Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water content of soil, changes due to weather or climate, surcharge loads (e.g., soil, other materials to be used in the trench) and other operations in the vicinity.

Competent Person

OSHA standards require that trenches be inspected daily and as conditions change by a competent person prior to worker entry to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to employees and who are authorized to take prompt corrective measures to eliminate or control these hazards and conditions.

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Access and Egress

OSHA requires safe access and egress to all excavations, including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations four feet or deeper. These devices must be located within 25 feet of all workers.

General Trenching and Excavation Rules

- Keep heavy equipment away from trench edges.
- Keep surcharge loads at least two feet from trench edges.
- Know where underground utilities are located.
- Test for low oxygen, hazardous fumes, and toxic gases.
- Inspect trenches at the start of each shift.
- Inspect trenches following a rainstorm.
- Do not work under raised loads.

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PICTURES NEEDED & THANK YOU!!

Do you have ***ACTION*** pictures of city employees working? If you do, KMIT is in need of them. We use these pictures on the KMIT website, in our *CompControl* and *City Safe* publications, as well as in KMIT brochures, flyers, etc. The pictures ***MUST*** be of city workers working . . . ***NO*** posed pictures. Digital format is highly desired. Please email pictures to Wendy Flowers at wflowers@lkm.org.

We would like to say ***THANK YOU*** to each city employee who has sent Wendy pictures recently. All of the pictures are great and very much appreciated. We are always in need of pictures to use, so feel free to send Wendy them whenever you take them. Watch for your city's pictures to be used!


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