



CONN-OSHA Quarterly

CONNECTICUT DEPARTMENT of LABOR DIVISION of OCCUPATIONAL SAFETY and HEALTH

Is Hearing Protection Enough?

By: Lisa Casale, Occupational Hygienist

Many state and municipal employers currently provide hearing protection, such as ear plugs and/or muffs, to their employees to protect them from the effects of noise. However, if you work for a public works or highway department, a parks and recreation or grounds maintenance department, or work or shoot at a firing range, hearing protection may not be enough.

Solely providing hearing protection often is not sufficient to meet the minimum requirements set forth in OSHA's Occupational Noise Exposure standard, 29 CFR 1910.95. To meet the requirements of this standard, *the employer must administer an on-going and effective hearing conservation program whenever employee noise exposures equal or exceed an 8-hour time-weighted average (TWA) sound level of 85 decibels (dB) (A-scale, slow response) or equivalently, a dose of fifty percent.* Some of the required elements of a hearing conservation program are discussed in the following paragraphs.

In order to determine if a hearing conservation program is needed, the employer must first determine the level of noise to which employees are exposed. Equipment that has the potential to expose employees to noise at or above the action level of 85 dB includes power lawn equipment, chain saws, wood chippers, woodworking equipment, firearms, or vehicles running in a repair facility. For example, the approximate decibel level of:

- normal conversation is 60 dB
- power lawn mower is 90 dB
- belt sander is 93 dB
- chainsaw is 100-110 dB
- sandblasting is 115 dB
- gun muzzle blast is 140 dB.

A general rule of thumb is if you have to raise your voice to talk to someone who is an arm's length away, then the noise is likely to be hazardous. The manufacturer's operating manual may also contain information about noise exposures and hearing protection recommendations for a particular piece of equipment. *When information indicates that any employee's exposure may equal or exceed 85 dB averaged over eight working hours, or an 8-hour TWA, the employer must develop and implement a monitoring program.*

The employer must also *establish and maintain an audiometric testing program by making audiometric testing available to all employees whose exposures equal or exceed an 8-hour TWA of 85 dB.* Audiometric testing monitors an employee's hearing over time. The audiometric testing must be provided *at no cost to the employee* and must occur at the following intervals: a baseline must be obtained *within 6 months of an employee's first exposure at or above the action level (85 dB) and at least annually* thereafter.

Paragraph (g) of the standard also states the requirements for *follow-up procedures* for employees who experience a standard threshold

shift. A standard threshold shift references a specific change in hearing threshold relative to the baseline audiogram.

Ideally, the employer should use engineering controls to reduce noise levels in the work environment; however as an alternative, an employer may make use of hearing protectors. The occupational noise standard requires employers to *provide hearing protectors to all employees exposed to an 8-hour TWA of noise of 85 dB or greater.* The employer must ensure that hearing protectors are worn by employees who: *are exposed to an 8-hour TWA of 85 dB and either have experienced a standard threshold shift or meet the mobile test van exception; or are exposed to noise over the permissible exposure limit of 90 dB over an 8-hour TWA.* The employer must provide employees, *at no cost, a selection of hearing protectors* including at least one variety of hearing plug and one variety of hearing muff.

As a part of the hearing conservation program, the employer also must *institute a training program for all employees who are exposed to noise at or above an 8-hour TWA of 85 dB.* Employees included in the hearing conservation program must be trained *at least annually* and the employer must ensure that the *employees are informed of:*

- the effects of noise on hearing;
- the purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use and care; and
- the purpose of audiometric testing, and an explanation of the test procedures.

The employer must also *post a copy of the Occupational Noise Exposure standard in the workplace* and comply with the *recordkeeping requirements* listed in paragraph (m) of the standard.

Every year, approximately 30 million workers in the United States are exposed to hazardous noise on the job. Based on workers' compensation disability settlements, it is estimated that hearing loss costs \$242.4 million per year in disability alone - and this figure does not include medical costs or personal costs which can include approximately \$1500 for a hearing aid and around \$300 per year for batteries. Although noise-induced hearing loss is preventable, once acquired, hearing loss is permanent and irreversible. Fortunately, the incidence of noise-induced hearing loss can be reduced or eliminated through the successful application of engineering controls and hearing conservation programs.

CONN-OSHA's free consultation program is available to assist employers with determining the need for and developing an effective hearing conservation program. For more information about the consultation program or the requirements for exposure to occupational noise, contact CONN-OSHA at (860) 263-6900. The Occupational Exposure to Noise standard, 29 CFR 1910.95, can be obtained at <http://www.osha.gov/>.

Wood Chipper Safety

By: John Able, Certified Safety Professional

A 33 year-old male tree trimmer died when pulled into a chipper at a job site...He was chipping small and medium size tree limbs that were being piled by other workers, and was working alone...At approximately 1:30 pm co-workers said they heard a strange noise come from the chipper, similar to an overload condition.

The Supervisor came to the rear of the truck, quickly realized what had happened and immediately called 911...There were no witnesses to the incident...The police concluded that the 5-foot, 8-inch tall decedent either lost his balance while feeding the trimmings into the chipper and was pulled into the chipper blades, or was leaning across the feeding table attempting to push the trimmings into the chipper when his gloves caught on the feeder rollers and he was pulled into the chipper blades.

The autopsy report reported the cause of death as "total body fragmentation." (California FACE Report #00CA010)



Chipper Safety Issues

Operating wood chippers can be dangerous for operators and others working nearby. When employees feed tree limbs and branches into chippers they are at risk of getting caught in the machine and being pulled into the fast-turning chipper knives.

According to the U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 32 employees were killed in chipper accidents from 2003-2007 (an average of two per month). Of these fatalities, the vast majority resulted from being pulled through the chipper knives at approximately 2 feet per second. Most of the remainder resulted from "struck-by" accidents.

Chippers are used to dispose of tree trimmings and other wood debris. Chippers generally consist of a powered feed mechanism, knives mounted on a rotating disc or



drum, and an internal combustion engine. Typically, employees feed branches into the in-feed chute by hand. Feed rollers at the end of the in-feed chute grab the branches and force them into the chipper knives. The drum and its knives chip the branches and force the chips through a discharge chute. The housing that contains the point-of-operation chipper disc is sectioned and includes a removable hood to allow access to the components for maintenance and repair.

Many chippers are equipped with a mechanical feed control bar that activates the feed rollers when it is pulled. The bar is mounted across the top and along the sides of the in-feed chute for quick and easy access. The American National Standards Institute (ANSI) ANSI Z133.1-2006 standard, "Safety Requirements for Arboricultural Operations," requires that chippers equipped with a mechanical feed control bar must have quick-stop and reverse feed devices for emergencies.

Chipper-Mounted Winch Safety Issues

Some manufacturers provide a winch to drag tree limbs that are too large to safely or comfortably pull to the back of the chipper's in-feed chute. Generally, a chipper with a winch assembly mounted directly above and in front of the chipper in-feed chute has the same standard use and safety features as one without a winch line. Winch log/tree capacity of 2,000 pounds and 19-inch diameter is common. Winch lines are composed of wire rope or braided synthetic rope depending on the application, and can be 150 feet long. A chain metal "choker" is used at the working end to attach the butt end of the tree limb to the winch line.

The winch line, including the metal choker or chain, may accidentally be drawn into the chipper's rotating knives causing forceful discharge of pieces of metal potentially injuring those nearby. The winch line may break or become detached while under load, and the forceful recoil can strike and injure those in the immediate vicinity. Workers' arms, hands, legs, or fingers can be caught between the winch line and the load or other obstructions in the load's path.

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Reducing Hazards Related to Chipper Use

The OSHA hierarchy of hazard control requires **engineering controls** be used first to eliminate or reduce occupational exposure to hazards. This is followed by **work practices/administrative controls** (including Training), and then **Personal Protective Equipment (PPE)** as a last resort. PPE is used only in combination with Work Practices / Administrative Controls.

Engineering Controls

Chipper safety devices are available to reduce the risk of “caught-in” or “struck-by” accidents. Some manufacturers have equipped chippers with one or more of these devices, including:

- Feed control bar
- Bottom feed stop bar
- Panic bar
- Emergency pull ropes
- Feed tray extensions
- Wooden push tools
- Flexible rubber curtain/flaps
- Discharge spout deflector/guard
- Chipper hood safety latch

Work Practices / Administrative Controls

Since chipper engineering controls do not entirely eliminate exposure to the hazard(s), additional protections must be provided through work practices / administrative controls. recommendations that will help ensure the safe operation of chippers include:

- Follow manufacturer's instructions on operation, inspection, maintenance, and
- Correct operation of the chipper and its safety controls, and
- Proper procedures for machine start-up and shut-down, and
- The operators manual should be on the machine, and all decals in legible condition.

Personal Protective Equipment (PPE)

Employees must also take the following precautions, wearing appropriate PPE:

- Correct use and maintenance of personal protective equipment,
- Use appropriate hand protection which is relative to the tasks to be performed, conditions present, and the hazards and potential hazards identified,
- Use appropriate eye, face and hearing protection,
- Wear a protective helmet,
- Wear gloves with no cuffs (non-gauntlet),

- Wear close-fitting and tucked-in clothing with no stray straps or strings, and
- Jewelry should not be worn while operating chippers.

Lockout/Tagout

Before beginning any servicing, maintenance or un-jamming operation, lockout/tagout procedures shall be utilized to control hazardous energy related to unexpected start-up of the chipper which could cause serious injury or death to the employee.

Health Issues

Organic Toxic Dust Syndrome (OTDS) is becoming more prevalent. When exposed to organic dust wear a dust mask. See <http://www.cdc.gov/nasd/docs/d001001-d001100/d001027/d001027.html> for more information.

Remember

A poor attitude and risky behavior usually precede an accident.

Three basic rules will prevent most injuries:

- Don't stick hands past mouth of in-feed chute,
- Don't stick feet past mouth of in-feed chute,
- Never open access panels when chipper knives/disk is turning or engine is running.

Useful links

- OSHA Chipper Machine Quick Card: <http://www.osha.gov/OshDoc/quickcards.html>
- National Ag Safety Database, Chipper/Shredder Safety: <http://www.cdc.gov/nasd/docs/d001801-d001900/d001876/d001876.html>
- James Madison University Chipper Safety: <http://www.jmu.edu/safetyplan/facilmgmt/trainingoutlines/chipper.shtml>
- Tree Care Industry Association, “Chipping Away at Chipper Safety” article by Rick Howland: http://www.treecareindustry.org/Articles/Safety/TCI0908_p32.htm
- WorkSafeBC Worker pulled through woodchipper slide show accident investigation: <http://www2.worksafebc.com/media/fss/woodchipper/slideshow.htm>

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To receive the *Quarterly* electronically, contact gregory.grayson@dol.gov. In the subject line type “*subscribe*” and provide your e-mail address. You may also reach us by phone at (860) 263-6900 or visit our website at <http://www.ctdol.state.ct.us/osha/osha.htm>

Hazard Corner...

There are many hazards that mechanics are exposed to as they perform maintenance work on heavy equipment. Dump trucks, fire engines, recycling and refuse vehicles, and city and school busses need regular maintenance. We as average individuals, might not consider the dangers of these routine daily maintenance activities. Over the past few years, there have been numerous injuries that are associated with this type of work in the public and private sectors.

In 2007, there was a Transit District mechanic working on a forty foot New Flyer bus. The mechanic drove the right rear dual bus tires onto a six by six piece of wood to elevate the truck. This allowed the mechanic to work underneath the bus on the brake adjusters. While he was working, the bus moved and the tires came off of the wood. The bus struck his chest, trapping him under the bus. When the self-leveling air system raised itself, the mechanic was able to get free. The employee was transported to an area hospital where he was treated for bruising across his chest and his right arm. Death was only

inches away.

In 2007, forty injuries occurred in Connecticut's private sector garages. Half of these injuries resulted in multiple days away from work. Fifty per-



cent of the injured mechanics sustained strains or sprains as a result of being struck by or against something.

There are many recognized hazards associated with working with heavy equipment. A recommendation for preventing injuries while performing equipment maintenance and repair would be to train employees to recognize and respect these hazards. Following OSHA regulations for lockout/tagout, 29 CFR 1910.147, and manufacturers recommendations while working on such vehicles would also help ensure employee safety.

CONN-OSHA ~ Training Update...

Trenching & Excavation Safety April 14, 2009 This workshop will provide an overview of 29 CFR 1926.650-652. Excavations, including the role of the competent person, will be discussed. The session is designed to assist participants in identifying hazards at their workplace, especially those associated with excavations and related activities. This class will be held from 10am-12 noon.

Work Zone Safety May 5, 2009 Basic guidelines for work zone traffic control and the requirements of Part VI of the Manual on Uniform Traffic Control Devices will be discussed. This class will be held from 10am-12 noon.

OSHA Recordkeeping May 29, 2009 Learn how to fill out the OSHA Log of Work-Related Injuries & Illnesses (Form 300) accurately and correctly. This class will be held from 9 am-12 noon.

Confined Space Safety June 9, 2009 This workshop includes the basic requirements and procedures involved with permit-required confined spaces as detailed in 29 CFR 1910.147 This class will be held from 10am-12 noon.

Breakfast Roundtable This discussion group meets the third Tuesday every month from 8:15 am to 9:45 am. Pre-registration is required. To be placed on the e-mail distribution list, contact John Able at able.john@dol.gov

Classes are free and held at 200 Folly Brook Boulevard, Wethersfield, CT in Conference Room A/B. To register, contact John Able at able.john@dol.gov. **Pre-registration is required.** For more training information, visit the CONN-OSHA web sight www.ctdol.state.ct.us/osha/osha.htm

Fatality & Casualty Reporting

State & Town: CONN-OSHA (860) 263-6946 (local) or 1-866-241-4060 (toll-free)
Private Employers: Report to Federal OSHA at 1-800-321-OSHA(6742)