

# OSHA and Logging Safety

- ◆ <http://www.osha.gov/SLTC/logging/index.html>
- ◆ <http://www.osha.gov/SLTC/etools/logging/mainpage.html>

# Logging Safety

- ◆ According to Bureau of Labor Statistics (BLS), logging is still a high hazard industry.
- ◆ The tools and equipment which logging employees use or operate, such as chainsaws, feller-bunchers, or others pose hazards whenever they are used in logging operations.
- ◆ The hazards are even more acute when dangerous environmental conditions are factored in, such as uneven, unstable or rough terrain.

# Logging Safety

- ◆ BLS indicated that there were 158 fatalities in the logging industry in 1992, which amounts to a 2 in 1,000 risk of death each year.
- ◆ NIOSH estimated that there are 16,500 compensable injuries each year in the logging industry. This amounts to an incidence rate of 1 in every 5 loggers.
- ◆ According to the USDA, the accident rate in the logging industry has pushed workers' compensation insurance to 40% of payroll costs.

# Logging Safety

- ◆ Two measures of logging injuries and illness are particularly useful:
  - OSHA Incidence Rate
  - Lost Workday Case Rate

# OSHA Incidence Rate

$$\text{OSHA Incidence Rate} = \frac{\text{Number of Injuries and ILLness} \times 200,000}{\text{Total Hours Worked by all Employees during Calendar Year}}$$

$$\text{Lost Workday Case Rate} = \frac{\text{Incident Rate of Lost Workdays} \times 200,000}{\text{Total Hours Worked by all Employees during Calendar Year}}$$

Both rate formulas use 200,000 as the base for 100 full-time Employees working 40 hours per week, 50 weeks per year.

# Comparison of Incidence Rates

Logging vs. major industries in 1991

| <b>Industry</b> | <b>Total Cases</b> | <b>Lost Workday Cases</b> |
|-----------------|--------------------|---------------------------|
| Logging         | 15.6               | 9.9                       |
| Agriculture     | 10.2               | 5.2                       |
| Mining          | 7.1                | 4.4                       |
| Construction    | 12.8               | 6.0                       |
| Manufacturing   | 11.2               | 5.0                       |
| Transportation  | 9.1                | 5.3                       |

(Source: Department of Labor. 1994. Federal Register 29 CFR Parts 1910 and 1828 – Logging Operations)

# Logging Injury Rates

| <b>Year</b> | <b>OSHA Incidence Rate</b> | <b>Lost Workday Cases</b> |
|-------------|----------------------------|---------------------------|
| 1989        | 19.5                       | 11.7                      |
| 1991        | 15.9                       | 10.0                      |
| 1993        | 13.8                       | 8.4                       |
| 1995        | 10.5                       | 6.7                       |

Since 1989, the OSHA incidence rate for the logging industry dropped from 19.5 injuries per 100 full-time workers to 10.5 in 1995. Injuries resulting in lost workdays fell from 11.7 per 100 full-time workers to 6.7 over the same period. (Source: BLS)

# Logging Fatality Data

| <b>Year</b> | <b>Annual Rate per 100,000 workers</b> |
|-------------|--|
| 1992        | 142                                    |
| 1993        | 133                                    |
| 1994        | 130                                    |
| 1995        | 101                                    |

The fatality census has been conducted in all 50 states. Logging fatality rate has declined steadily in recent years.  
(Source: BLS)



# Causes of Logging Fatality

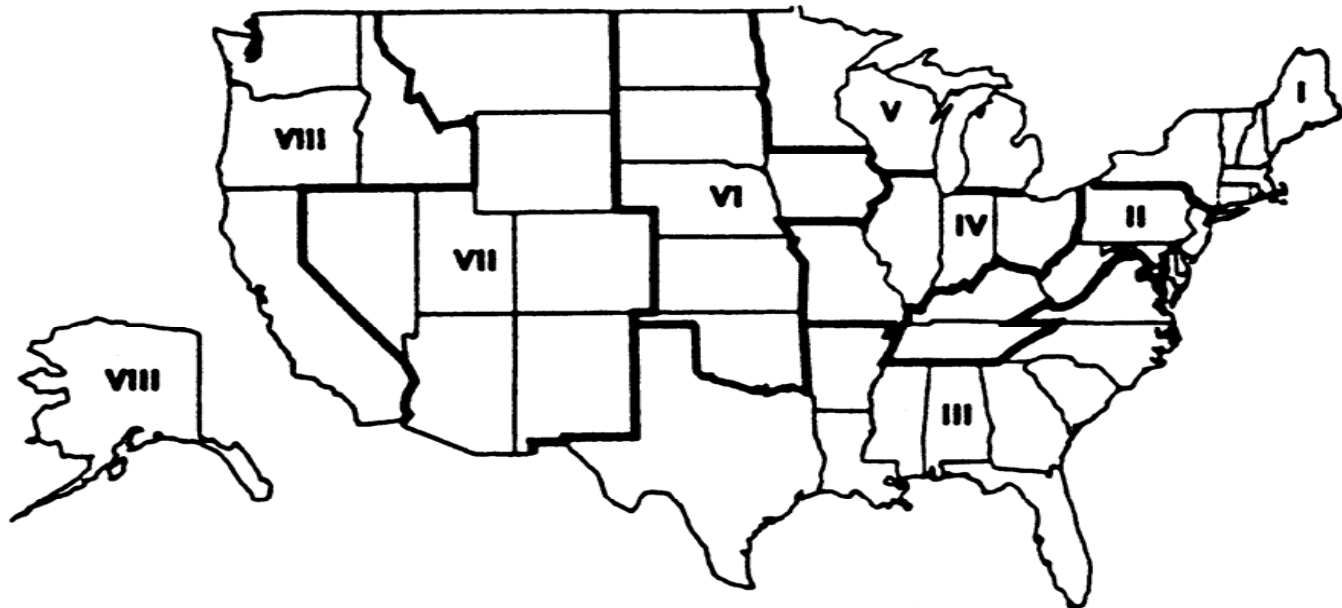
| <b>Cause</b>      | <b>Frequency</b> | <b>%</b> |
|-------------------|------------------|----------|
| Falling objects   | 636              | 50       |
| Machinery         | 185              | 14       |
| Motor Vehicles    | 183              | 14       |
| Caught in/Between | 114              | 10       |
| Other Causes      | 64               | 5        |
| Environmental     | 38               | 3        |
| Falls             | 25               | 2        |
| Electrocution     | 16               | 1        |
| Unknown           | 17               | 1        |

(Source: Department of Labor. 1994. Federal Register 29 CFR Parts 1910 and 1828 – Logging Operations)

# Causes of Logging Fatality

- ◆ 50% of logging fatalities resulted from “being struck by a falling object”.
- ◆ The next three groups (machinery, motor vehicle and caught in, under, or between objects) accounted for another 38% of all non-managerial worker deaths.

# Logging Fatality Distribution by Region



| Region      | Rate | Region        | Rate | Region        | Rate |
|-------------|------|---------------|------|---------------|------|
| I Northeast | 99   | IV Central    | 394  | VII Mountains | 254  |
| II East     | 339  | V Lake States | 87   | VIII Pacific  | 167  |
| III South   | 143  | VI Plains     | 189  |               |      |

# Logging Fatality Distribution

- ◆ Logging industry has an annual fatality rate far exceeds the national average of seven deaths per 100,000 workers.
- ◆ Two regions with the highest fatality rates, the Central and East, are areas with a heavy concentration of hardwood sawtimber.
  - Terrain is often sloped and rough
  - The harvesting method is often diameter-limit or single-tree selection cuts
  - Chainsaw felling is a common felling method

# Factors Associated With Logging Safety

| <b>Lower Risk?</b>    | <b>Higher Risk?</b>   |
|-----------------------|-----------------------|
| Softwood harvesting   | Hardwood harvesting   |
| Pulpwood harvesting   | Sawtimber harvesting  |
| Clearcuts             | Selective cuts        |
| Plantation stands     | Natural stands        |
| Mechanized harvesting | Manual harvesting     |
| Level terrain         | Steep terrain         |
| Safety regulations    | No safety regulations |

# OSHA

- ◆ Safety regulations and training are believed to be the most important factors to influence the logging accidents.
- ◆ OSHA (Occupational Safety and Health Administration) is a national logging safety standard.

# OSHA

- New OSHA logging standards have been effective since 1995. The old OSHA of 1971 was replaced.
- All logging operations, regardless of the product produced, are covered.
- The new standards do not cover:
  - the construction or
  - use of cable yarding (which are detailed in state logging safety standards in most Western states)

# Employee Rights

- ◆ Employers must be certain that their workers know their rights under OSHA.
- ◆ Two of the most important employee rights are:
  - **the right to complain to OSHA** about alleged safety or health problems and to request an OSHA inspection
  - **the right to be provided a copy of the OSHA Act** or the OSHA safety standards on request to the employer.



# OSHA Coverage

- ◆ All logging operations with employees are covered.
- ◆ Employers of eleven or more workers must keep injury records and submit them to OSHA.

# Contents of OSHA

- ◆ General Requirements
- ◆ Hand and Portable Power Tools
- ◆ Machines
- ◆ Vehicles
- ◆ Tree Harvesting
- ◆ Training

# Personal Protective Equipment

The employer shall assure and provide that:

- ◆ Condition: the PPE is in a serviceable condition.
- ◆ Inspection, Repair, Replacement: inspect it before initial use.
- ◆ Leg protection: especially for chainsaw operator.
- ◆ Foot protection, hard hats, eye and face protection.

# First Aid Kits

- ◆ The employer shall provide first-aid kits
  - at each site where felling is being conducted,
  - at each landing, and on each employee transport vehicle
- ◆ Minimum contents shall be contained.
- ◆ The employer shall maintain the contents of each first-aid kit in a serviceable condition.

# Work Areas

- ◆ Employees shall be spaced
  - the duties of each employee shall be organized
  - so the actions of one employee will not create a hazard for any other employee.
- ◆ Work areas shall be assigned
  - so that tree can not fall into an adjacent occupied area
  - the distance between adjacent occupied work areas shall be **at least two tree lengths** of the trees being felled.
- ◆ Each employee shall work in a position or location that is within visual or audible contact with another employee.

# Chain Saws

- ◆ Saw chains are in a proper adjustment.
- ◆ Chainsaw mufflers are operational and in place.
- ◆ Chain brakes and nose shielding devices are in place and function properly.
- ◆ Cutting edges are sharp and properly shaped.

# Chain Saws

- ◆ Each chainsaw shall be equipped with a protective device
  - To minimize chain-saw kickback
  - No chainsaw kickback device shall be removed or otherwise disabled.
- ◆ The chainsaw shall be operated and adjusted in accordance with the manufacturer's instructions.
- ◆ The chainsaw shall be started with the chain brake engaged.

# Chain Saws

- ◆ Prior to felling any tree, the chainsaw operator shall clear away brush or other potential obstacles which might interfere cutting the tree or using retreat path.
- ◆ The chainsaw shall not be used to cut directly overhead.
- ◆ The chainsaw shall be shut off or at idle before the feller starts his retreat.
- ◆ The chainsaw shall be shut down or the chain brake shall be engaged whenever a saw is carried further than 50 feet.



# Machines

- ◆ OSHA defines “machines” as “a piece of self-propelled stationary or mobile equipment that is operated off-road and used for the movement of material”.
- ◆ Machines include but not limited to:
  - Tractors, skidders, front-end loaders, bulldozers
  - Swing yarders, and mechanical felling devices, such as tree shears and feller-bunchers.

# Machine Operation

- ◆ The machine shall be started and operated by a designated person.
- ◆ Stationary logging machines and their components shall be anchored or otherwise stabilized.
- ◆ The rated capacity of any machine shall not be exceeded.
- ◆ The machine shall be operated at such a distance from employees and other machines such that operation will not create a hazard for an employee.
- ◆ No employee shall ride on any load.

# Protective Structures

- ◆ Each feller-buncher, harvester, skidder, forwarder, loader placed into initial service after Feb. 9, 1995 shall be equipped with:
  - falling object protective structure (FOPS) and/or
  - rollover protective structure (ROPS)
- ◆ The employer shall replace FOPS or ROPS which have been removed from any machine.

# Protective Structures

- ◆ ROPS shall be installed, tested, and maintained in accordance with SAE J1040 “Performance Criteria for ROPS”.
- ◆ FOPS shall be installed, tested and maintained in accordance with the SAE J231 “Minimum Performance Criteria for FOPS”.
- ◆ ROPS an FOPS shall meet the requirements of the SAE J397 “Deflection Limiting Volume ...”.
- ◆ Each protective structure shall be of a size that does not impede the operator’s normal movements.

# Machine Access

- ◆ Machine access systems shall be provided for each machine.
- ◆ The walking and working surface of each machine shall be kept free of waste, debris, and any other material which might result in fire, slipping, or falling.

# Vehicles

- ◆ “Vehicle” is defined by OSHA” as “a car, bus, truck, trailer, or semi-trailer that is used for transportation of employees or movement of material.”
- ◆ Some standards which apply to machines also apply to vehicles.

# Tree Harvesting

- ◆ Trees shall not be felled in a manner that may create a hazard for an employee.
  - such as but not limited to striking a rope , cable, power line, or machine.
- ◆ While manual felling is in progress, no skidding or yarding machine shall be operated within two tree lengths of trees being manually felled.
- ◆ No employee shall approach a feller closer than two tree lengths of trees being felled.

# Tree Harvesting

- ◆ Similarly, no employee shall approach a mechanical felling operation closer than two tree lengths of the trees being felled until the machine operator has acknowledged that it is safe to do so.
- ◆ Each danger tree shall be felled, removed or avoided.



# Tree Harvesting

- ◆ Felling on any slope where rolling or sliding of trees or logs is reasonably foreseeable shall be done uphill from, or on the same level as previously felled trees.
- ◆ Domino felling of trees, including danger trees, is prohibited.

# Tree Harvesting

- ◆ **“Danger tree”** is defined by OSHA as
  - “a standing tree that presents a hazard to employees
  - due to conditions such as deterioration or physical damage to the root system, trunk, stem or limb.”
- ◆ **“Domino felling”** is defined by OSHA as “the partial cutting of multiple trees which are left standing and then pushed over with a pusher tree.”

# Manual Felling

- ◆ Before felling is started, the feller shall plan and clear a retreat path.
- ◆ Before each tree is felled, the following conditions should be evaluated:
  - snow and ice accumulation,
  - the wind,
  - the lean of tree,
  - dead limbs, and
  - the location of other trees
- ◆ Precautions should be taken so a hazard is not created for an employee.

# Bucking and Limbing

- ◆ Bucking and limbing on any slope where rolling or sliding of trees or logs is reasonably foreseeable:
  - shall be done on the uphill side of each tree,
  - unless the worker demonstrates that it is not feasible to buck or limb on the uphill side

# In-woods Chipping

- ◆ Infeed and discharge ports shall be guarded to prevent contact with the disc, knives, or blower blades.
- ◆ Detached trailer chippers shall be chocked during usage on any slope where rolling or sliding of the chipper is reasonably foreseeable.

# Skidding

- ◆ No log shall be moved until each employee is in the clear.
- ◆ No load shall exceed the rated capacity of the machine.
- ◆ Each choker shall be positioned near the end of the log or tree length.
- ◆ Each machine shall be positioned during winching so the machine and winch are operated within their design limits.

# Loading and Unloading

- ◆ The transport vehicle shall be positioned to provide working clearance between the vehicle and the deck.
- ◆ Only the loading or unloading machine operator shall be in the work area during loading and unloading.
- ◆ No transport vehicle operator shall remain in the cab during loading and unloading if the logs are carried or moved over the truck cab.

# Training

- ◆ Training is an important measure to take to prevent logging accidents.
- ◆ The employer shall provide training for each employee, including supervisors, at no cost to the employee.



# Training Frequency

- ◆ Prior to initial assignment for each new employee.
- ◆ Whenever the employee is assigned new work tasks, tools, equipment, machines or vehicles.
- ◆ Whenever an employee demonstrates unsafe job performance.

# Training Contents

- ◆ Safe performance of assigned tasks;
- ◆ Safe use, operation and maintenance of tools, machines, and vehicles;
- ◆ Recognition of safety and health hazards associated with the employee's tasks;

# Training Contents

- ◆ Recognition, prevention and control of other safety and health hazards in the logging industry;
- ◆ Procedures, practices and requirements of the employer's work site; and
- ◆ The requirements of this standard.

# Training

- ◆ The employer shall assure that each employee, including supervisor, receives or has received first-aid and CPR training.