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**“OSHA’s Fatal Facts: Fatalities
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OSHA's Fatal Facts: Fatalities Caused by Improper Work Practices

by

Mark P. Rossow PE, PhD

1. Introduction

This course is based on case studies taken from the Occupational Safety and Health Administration's "Fatal Facts" (http://www.osha.gov/OshDoc/toc_FatalFacts.html)—descriptions of accidents in which one or more workers died because of improper work practices. Reading and thinking about these case studies gives an immediacy and emotional impact—"Do you mean somebody died because of *this*?"—that can't be obtained from an abstract discussion of general principles alone.

The present document first provides background information about the types and frequency of work-related accidents both in general and in the particular case of Fatal Facts accidents. Then some guidelines are given for preventing accidents by following proper work practices. The remainder of the document consists of Fatal Facts accident summaries.

2.1 Background on Work-Related Accidents

To appreciate the significance of the Fatal Facts, it is helpful to be familiar with the extent and types of work-related accidents in general. In the United States at the present time, about 4,500* workers die each year from work-related injuries. In addition to these fatalities, serious injuries (those involving the loss of six or more days of work) represent over \$53 billion a year in employer costs—a large proportion of which is attributable to workers' compensation costs. Some idea of the types of accidents that occur can be gained by examining the list of the top ten most frequently cited OSHA standards violated in FY2010:

- Scaffolding, general requirements, construction
- Fall protection, construction
- Hazard communication standard, general industry
- Ladders, construction
- Respiratory protection, general industry
- Control of hazardous energy (lockout/tagout), general industry
- Electrical, wiring methods, components and equipment, general industry
- Powered industrial trucks, general industry
- Electrical systems design, general requirements, general industry
- Machines, general requirements, general industry

The occurrence of three fall-related violations (scaffolding, fall protection, and ladders) is noteworthy.

*All numbers are taken from "Commonly Used Statistics" on OSHA's website.

2.2 Construction Accidents

The above discussion concerns accidents in all industries. Focusing attention on the construction industry alone shows that construction accounts for about one-fifth of all fatal accidents, and about 57% of these are attributable to the “Fatal Four”:

- Falls – 35%
- Electrocutions – 10%
- Struck by Object – 8%
- Caught-in/between – 4%

Again, the prevalence of fatalities from falls stands out.

3. Types of Fatal Facts Accidents

OSHA began compiling Fatal Facts in 1984. Since that time, many accidents have been added to the list, and by 2011 it had grown to a total of seventy. Many of these accidents are of a similar type—falls comprise almost a third of the total—so to reduce duplication while still providing the reader with a wide spectrum of accident types, in this document the seventy accidents have been whittled down to thirty distributed among the following categories:

- falls
- asphyxiation
- nail gun
- falling object
- trenches
- caught in between
- electrocution/electrical shock
- explosion and fire
- drowning
- caught in machinery

It is interesting to compare this list with the list, previously given, of the top ten most frequently cited OSHA *standards violated* in FY2010. Although there is some overlap, especially in fall-related items, the lists are not identical. Some types of accidents are generally more lethal than others, and the list of violations refers to *all* situations—whether an accident has occurred or not—while the first list refers to lethal violations only.

4. Accident Prevention Through Proper Work Practices

Reading the Fatal Facts accident summaries below is a sobering experience. In most cases, people died not because of some rare, one-in-a-million incident, but because someone made a simple mistake. Yet the mistakes are not isolated, unique events. They share some features in

common, and examining these features can lead us to formulate the following general, common-sense principles for accident prevention through proper work practices:

4.1. Training. Recognize that training in proper work practices is a necessary and unavoidable cost of doing business. Training consists of two things: 1) learning the use of equipment and procedures that are new to the worker, and 2) learning what particular hazards exist on the current job site. Neither of these things is necessarily expensive or time-consuming, although they may be in some instances. Telling a novice worker about the necessary precautions to take when using a powder-actuated nail gun—that it can shoot nails completely through a hollow wall, for example—would be enough to alert the worker to a potential hazard. Reminding workers that when power lines are present, so is the danger of electrocution. Or that any time flammable fluids are present, explosions are possible. Or if a heavy object is overhead, the worker is always at risk of being crushed. Or that entry into a confined space presents unique dangers.

4.2. Safety Devices. Recognize that identifying and installing proper safety devices is a necessary and unavoidable cost of doing business. Many accidents are the result of cutting corners, ignoring known safety devices so that things can be done faster and more cheaply. Railings are not installed, safety harnesses and tethers are avoided, trench walls are not shored and braced, respirator protection is not provided, barricades around machines are absent, and so on. Omitting these devices is a false economy; the cost, both in financial and personal terms, of even a single fatality or serious injury will far exceed any expected savings from the omission. OSHA standards provide much useful information about what precautions must be taken and what devices should be used.

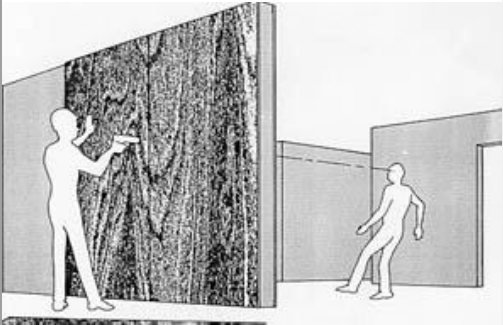
4.3. Supervision and Enforcement. Recognize that monitoring workers' compliance with safety rules—and enforcement of the rules, when compliance is lacking—is a necessary and unavoidable cost of doing business. In the absence of monitoring and enforcement, training and safety devices may be ineffective and a waste of time and money.

5. Notes on Reading the Accident Summaries.

5.1. OSHA standards have changed over the years, and the current standards at <http://www.osha.gov/> should be consulted before using the accident summaries below for training. Similarly, many of the contact addresses and reference citations may not be current, and a visit to the OSHA website is highly advised.

5.2. OSHA states that all Fatal Facts cases were selected —as being representative of fatalities caused by improper work practices. No special emphasis or priority is implied nor is the case necessarily a recent occurrence. The legal aspects of the incident have been resolved, and the case is now closed.” The numbering of the Accident Summaries below corresponds to the numbering used on OSHA’s website.

ACCIDENT SUMMARY No. 2

Accident Type:	Struck by Nail	
Weather Conditions:	N/A	
Type of Company:	General Contractors	
Size of Work Crew:	17	
Union or Non-union:	Union	
Worksite Inspection?:	No	
Designated Competent Person on Site?:	No	
Employer Safety and Health Program?:	No	
Training and Education for Employees?:	No	
Craft of Deceased Employee(s):	Carpenter	
Age;Sex	22; Male	
Time of the Job:	3:00 p.m.	
Time at the Task	Unknown	

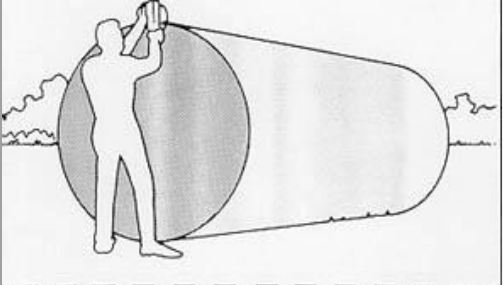
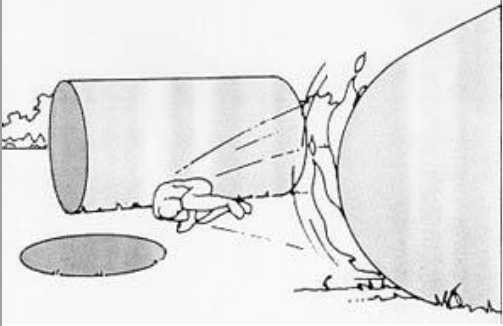
BRIEF DESCRIPTION OF ACCIDENT

A carpenter apprentice was killed when he was struck in the head by a nail that was fired from a powder actuated tool. The tool operator, while attempting to anchor a plywood form in preparation for pouring a concrete wall, fired the gun causing the nail to pass through the hollow wall. The nail travelled some twenty-seven feet before striking the victim. The tool operator had never received training in the proper use of the tool, and none of the employees in the area were wearing personal protective equipment.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Institute a program for frequent and regular inspections of the job site, materials, and equipment by a competent person(s) (1926.20(b)(2)).
2. Require employees exposed to the potential hazards associated with flying nails to use appropriate personal protective equipment. (1926.100(a) and 1926.102(a)(1)).
3. Train employees using powder actuated tools in the safe operation of the particular tool (1926.302(e)(2)).
4. Train employees operating powder actuated tools to avoid firing into easily penetrated materials (1926.302(e)(8)).

ACCIDENT SUMMARY No. 3

Accident Type:	Explosion	
Weather Conditions:	Clear	
Type of Company:	Removal/Installation/Junking of Gasoline Pumps and Underground Tanks	
Size of Work Crew:	2	
Union or Non-union:	Non-union	
Worksite Inspection Conducted (1926.20(b)(2)):	No	
Designated Competent Person on Site (1926.20(b)(2)):	No	
Employer Safety Health Program:	No	
Training and Education for Employees Designated (1926.21(b)):	No	
Craft of Deceased Employee(s):	Laborer	
Age & Sex	27; Male	
Time on the Job:	2 years	
Time on Task:	1 hour	

BRIEF DESCRIPTION OF ACCIDENT

A laborer was killed when a gasoline storage tank he was cutting with a portable power saw exploded. The worker's company was involved in installing, removing and junking gasoline pumps and underground tanks.

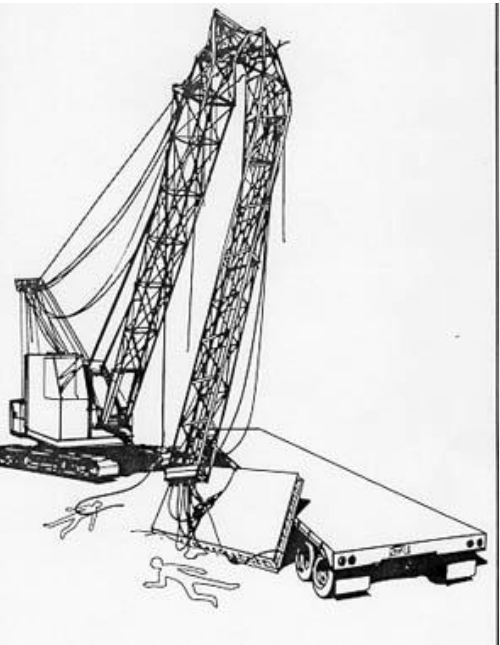
Although he had experienced working with the saw and scrap materials, the worker did not adequately purge the tank and test for vapors before beginning to cut. The 18 x 6 foot, 3000 gallon tank had been used recently for underground storage at a service station. At the time of the explosion, the mechanic was cutting on the tank with a gasoline powered portable saw equipped with an abrasive epoxy disk for cutting metal. The explosion propelled the worker 10 to 15 feet from the tank into another tank.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Train employees to recognize and avoid unsafe conditions when working with tanks that have previously contained flammable liquids (29 CFR 1926.21(b)(2)).

2. Follow recommended procedures set forth in American Petroleum Institute (API) Bulletin 1604, "Recommended Practice for Abandonment or Removal of Used Underground Service Station Tanks".
3. Test atmosphere in tank prior to work or cutting.
4. Establish guidelines for gas-freeing.

ACCIDENT SUMMARY No. 4

Accident Type:	Struck by Collapsing Crane Boom	
Weather Conditions:	Clear	
Type of Company:	General Contractor	
Size of Work Crew:	9	
Union or Non-union:	Union	
Worksite Inspections Conducted:	Yes	
Designated Competent Person on Site (1926.20(b)(2)):	Yes	
Employer Safety Health Program:	Yes	
Training and Education for Employees:	Yes	
Craft of Deceased Employee(s):	1. Iron Worker 2. Management Trainee	
Age & Sex	1. Ironworker-35; male 2. Management Trainee-26; male	
Time on the Job:	1 hour	
Time on Task:	1 hour	

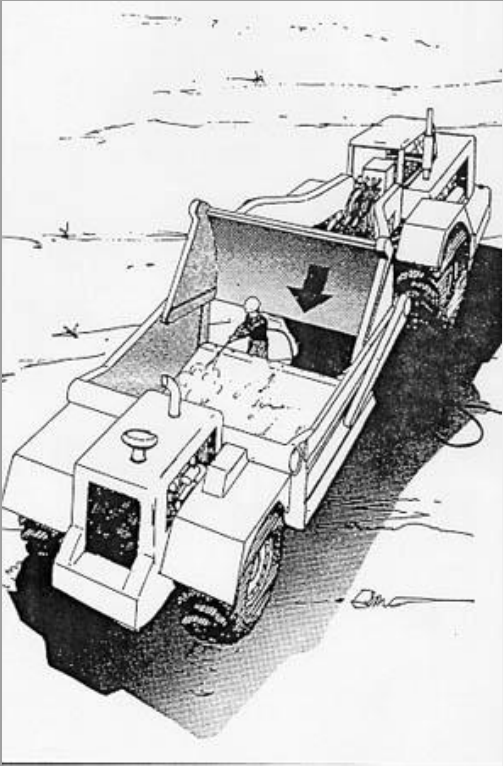
BRIEF DESCRIPTION OF ACCIDENT

A crew of ironworkers and a crane operator were unloading a 20-ton steel slab from a low-boy trailer using a 50-ton crawler crane with 90-foot lattice boom. The operator was inexperienced on this crane and did not know the length of the boom. Further, no one had determined the load radius. During lifting, the load moved forward and to the right, placing a twisting force on the boom. The boom twisted under the load, swinging down, under and to the right. Two employees standing 30 feet away apparently saw the boom begin to swing and ran. The boom struck one of the employees - an ironworker - on the head, causing instant death. Wire rope struck the other -- a management trainee -- causing internal injuries. He died two hours later at a local hospital.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Train and test operators to determine qualifications: 29 CFR 1926.21(b)(2) and 29 CFR 1926.550(b) ANSI B30.5 5-3.1.2.
2. Require proper written procedures to insure the method for lifting is within manufacturer's specifications: 29 CFR 1926.550(a)(1).

ACCIDENT SUMMARY No. 5

Accident Type:	Caught in or Between	
Weather Conditions:	Clear	
Type of Company:	Street Paving Contractor	
Size of Work Crew:	1	
Union or Non-union:	Non-Union	
Worksite Inspections Conducted (1926.20(b)(2)):	Yes	
Designated Competent Person on Site (1926.20(b)(2)):	Yes	
Employer Safety Health Program:	Yes	
Training and Education for Employees (1926.21(b)):	Yes	
Craft of Deceased Employee(s):	Ironworker	
Age & Sex:	22-Male	
Time on the Job:	1 day	
Time on Task:	3 Hours	

BRIEF DESCRIPTION OF ACCIDENT

A laborer was steam cleaning a scraper. The bowl apron had been left in the raised position. The hydraulically controlled apron had not been blocked to prevent it from accidentally falling. The apron did fall unexpectedly and the employee was caught between the apron and the cutting edge of the scraper bowl. The apron weighted approximately 2500 pounds.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Employer shall instruct each employee to recognize and avoid unsafe conditions applicable to his work environment (1926.21(b)(2)).
2. Bulldozer and scraper blades and similar equipment shall either be fully lowered or blocked when being repaired or not in use.

ACCIDENT SUMMARY No. 6

Accident Type:	Fall from Elevation	
Weather Conditions:	Clear	
Size of Work Crew:	4	
Collective Bargaining	Non-Union	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	Yes	
Type of Operation:	Painting Contractor	
Employee Job Title:	Painter	
Age & Sex:	36-Male	
Time on the Job:	1 Week	
Time on Task:	1 Hour	

BRIEF DESCRIPTION OF ACCIDENT

A painter foreman climbed over a bridge railing to inspect work being done, slipped, and fell 150 feet to his death.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Employers are to require employees to wear appropriate personal protective equipment (safety belts) in all operations where employees are exposed to hazardous conditions or in specific circumstances are required in OSHA standards 29 CFR 1926.28(a) and 29 CFR 1926.104(a).
2. Safety nets must be provided when workplaces are more than 25 feet above the ground or water surface, or other surfaces where the use of ladders, scaffold, catch platforms, temporary floors, safety lines, or safety belts is impractical as in accordance with OSHA standard 29 CFR 1926.105(a).
3. Except where either permanent or temporary stairways or suitable ramps or runaways are provided, suitable ladders should be used to give safe access to all elevations in accordance with OSHA standard 29 CFR 1926.450(a)(1).

ACCIDENT SUMMARY No. 7

Accident Type:	Crushed by Falling Wall	
Weather Conditions:	Clear	
Type of Operation:	Demolition	
Size of Work Crew:	4	
Collective Bargaining	Yes	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	Yes	
Employee Job Title:	Laborer	
Age & Sex:	18-Male	
Experience at this Type of Work:	3 Weeks	
Time on Project:	1 Weeks	

BRIEF DESCRIPTION OF ACCIDENT

A front end loader was being used to remove a piece of pipe and conduit near two 13 foot high nonload bearing cement block walls. The front end loader, equipped with a "clam" attachment, was pulling on pipe and conduit which ran through the upper part of the cement block walls. Pulling on the piping caused the wall to collapse, crushing and killing a laborer who was working within five feet of the base.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations for one serious and three other than serious violations of its construction standards.

OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Except for authorized persons, anyone not involved with the demolition work in progress must be prohibited from being in a demolition area (29 CFR 1926.859(a)).

2. While demolition is underway, a competent person must continually inspect the operations as the work progresses to detect an hazards caused by the weakening of walls or other deterioration of materials (29 CFR 1926.859(g)).
3. In addition to these precautions, danger signs should be posted where an immediate hazard exists.

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations covering construction.
- OSHA Safety and Health Training Guidelines for Construction (available from the National Technical Information Service -- Order No. PB-239-312/AS) comprised of set of 15 guidelines to help construction employers establish a training program in the safe use of equipment, tools and machinery the job.
- OSHA-funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (list under the U.S. Department of Labor or under the state government section where states administer the own OSH programs).

ACCIDENT SUMMARY No. 8

Accident Type:	Struck by Falling Object	
Weather Conditions:	Clear	
Type of Operation:	Transmission Tower Construction	
Size of Work Crew:	4	
Union or Non-union	Union	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Groundman (Framer)	
Age & Sex:	24-Male	
Experience at this Type of Work:	2 Years	
Time on Project:	3 Days	

BRIEF DESCRIPTION OF ACCIDENT

Ball and socket connectors are used to attach conductor stringing blocks to insulators on the arms of 90 foot metal towers of electrical transmission lines. Normally stainless steel cotter keys secure the ball and socket connector in place. In this case, however, black electrical tape was wrapped around the socket to keep the ball in place rather than a cotter key. The tape apparently stretched and the ball came loose, dropping the stringing block approximately 90 feet onto the head of an employee below, one of a four-man erection crew.

INSPECTION RESULTS

As result of its investigation, OSHA issued citations alleging three serious and two other-than-serious violations.

OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.


ACCIDENT PREVENTION RECOMMENDATIONS

1. Rigging and equipment must be inspected regularly and maintained in safe operating condition as required by general provisions of OSHA's construction (29 CFR 1926.995).
2. Employees must be instructed to recognize and avoid unsafe conditions and be made aware of regulations which apply to the work and the work area to eliminate safety and health hazards as required in the safety training and education section of OSHA's construction safety standards (29 CFR 1926.21(b)(2)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations covering construction.
- OSHA Safety and Health Training Guidelines for Construction (available from the National Technical Information Service -- Order No. PB-239-312/AS) comprised of set of 15 guidelines to help construction employers establish a training program in the safe use of equipment, tools and machinery the job.
- OSHA-funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under the U.S. Department of Labor or under the state government section where states administer the own OSH programs).
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Dr., Des Plaines, Ill. 60018 (302) 297-4810.

ACCIDENT SUMMARY No. 9

Accident Type:	Trench Cave-in	
Weather Conditions:	Good	
Type of Operation:	Pipe Laying	
Size of Work Crew:	3	
Collective Bargaining:	No	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	No	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Pipe Layer	
Age & Sex:	32-Male	
Experience at this Type of Work:	4 Months	
Time on Project:	5 Minutes	

BRIEF DESCRIPTION OF ACCIDENT

Two employees were installing storm drain pipes in a trench, approximately 20-30 feet long, 12-13 feet deep and 5-6 feet wide. The side walls consisted of unstable soil undermined by sand and water. There was 3-5 feet of water in the north end of the trench and 5-6 inches of water in the south end. At the time of the accident, a backhoe was being used to clear the trench. The west wall of the trench collapsed, and one employee was crushed and killed.

INSPECTION RESULTS

As result of the its investigation, OSHA issued citations for one willful, one serious, and one other-than-serious violation of its construction standards.

OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.

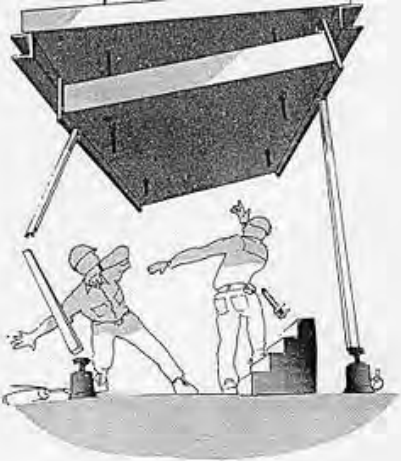
ACCIDENT PREVENTION RECOMMENDATIONS

1. Employers must shore, slope sheet or brace sides of trenches in unstable material (29 CFR 1926.652(b) or 1926.651(c)).
2. There must be a means of escape from a trench such as ladder (29 CFR 1926.652(h)).
3. Trench work is to be inspected daily by a "competent person". When there s evidence of cave-ins or slides, all work must stop (29 CFR 1926.650(i)).
4. Water must not be allowed to accumulate in a trench (29 CFR 1926.651(p)).
5. Excavation material must be moved at least two feet from the edge of the trench (29 CFR 1926.651(i)).
6. Where heavy equipment is operating near a trench, extra precautions must be taken due to the extra load imposed on the ground (29 CFR 1926.651(q)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations covering construction.
- Excavation and Trenching Operations (OSHA 2226), is a 20-page booklet describing pertinent OSHA standards in detail.
- Safety and Health Excavation and Trenching Operations, available from the National Audio Visual Center (NAC) (Order No. 689601, \$60) an instructional program designed to increase awareness and understanding of the problems and hazards in excavation and trenching operations. It includes an instructor's guide and 139 slides.
- Trenching, also available from NAC (Order No. 007516, \$40), a slide-tape hazard recognition program including 96 slides, instructor's guide, workbook and course outline.
- Sloping, Shoring and Shielding, a one-day instructional program with classroom sessions and hands-on workshop. Available from NAC (Order No. 009863, \$30), the package includes an instructor's manual, outline for field exercise/workshop and 60 slides.

ACCIDENT SUMMARY No. 10

Accident Type:	Crushed by Falling Machinery	
Weather Conditions:	Dry, Partly Sunny	
Type of Operation:	General Contractor	
Size of Work Crew:	2	
Collective Bargaining	Yes	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Millwright	
Age & Sex:	29-Male	
Experience at this Type of Work:	2 years	
Time on Project:	3 weeks	

BRIEF DESCRIPTION OF ACCIDENT

Two employees were making final adjustments to a large machine in a new paper mill facility. They were using two hydraulic jacks and two 4" × 4" uprights under one end of the 6,000 lb. piece of equipment which was suspended by four ¾ threaded rods. First, the employees would jack up one end of the piece about an inch. Then, one employee would climb a set of temporary steps to hand tighten the nuts on the threaded rods. Thus, the 6,000 lb. piece was supported solely by the two vertical timbers on the heads of the hydraulic jacks. The timbers were set under a 5/8" side rail without any block or other devices between them. No cribbing, blocking, shoring or other stabilizing methods were used to secure the load after it was raised. When the end of the piece was jacked up, it fell, crushing one employee and narrowly missing the other.

INSPECTION RESULTS

As result of the its investigation, OSHA issued citations for three alleged serious violations of its standards. OSHA standards include several requirements which, if they had been followed, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Establish written procedures outlining the steps to be followed during installation of new equipment. Review the procedures with employees to ensure they understand and arrange

for supervisors to check periodically to see that the established procedures are being followed.

2. Train employees in the proper inspection techniques for hydraulic jacks and the procedures to be used during the installation of the equipment (1926.21(b)(2)).
3. Crib or block the load after raising to secure it against movement (1910.244(a)(2)(iii)).
4. Inspect hydraulic jacks at least every 6 months for deteriorated lines, leaks, mushroomed heads, etc. (1910.244(a)(2)(vi)(a)).
5. Inspect rigging equipment prior to each shift use (1926.251 (a)(1)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.
- OSHA Safety and Health Training Guide-lines for Construction (available from the National Technical Information Service - Order No. PB-239-312/AS) comprised of a set of 15 guidelines to help construction employees establish a training program in the safe use of equipment, tools, and machinery on the job.
- OSHA-funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under the U.S. Department of Labor or under the state government section where states administer the own OSH programs).

ACCIDENT SUMMARY No. 11

Accident Type:	Electrocution
Weather Conditions:	Wet Ground
Type of Operation:	Remodeling
Size of Work Crew:	2
Collective Bargaining	No
Competent Safety Monitor on Site:	Yes
Safety and Health Program in Effect:	No
Was the Worksite Inspected Regularly:	Yes
Training and Education Provided:	No
Employee Job Title:	Carpenter
Age & Sex:	33-Male
Experience at this Type of Work:	30 Days
Time on Project:	3 Days



BRIEF DESCRIPTION OF ACCIDENT

Two employees were installing aluminum siding on a farmhouse when it became necessary to remove a 36-foot high metal pole CB antenna. One employee stood on a metal pick board between two ladders and unfastened the antenna at the top of the house. The other employee, who was standing on the ground, took the antenna to lay it down in the yard. The antenna made electrical contact with a 7200-volt power transmission line 30 feet 10 inches from the house and 23 feet 9 inches above the ground. The employee handling the antenna received a fatal shock and the other employee a minor shock.

INSPECTION RESULTS

Following its investigation, OSHA issued one citation for two alleged serious violations of its construction standards. Had these standards been adhered to, the fatality might have been prevented.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Note the presence of power lines and be extremely cautious when working near them. Train employees to recognize and avoid electrical hazards (29CFR 1926.21(b)(2)).
2. Do not permit employees to work near any part of an electrical power circuit which might be contacted in the course of the work. Guard all electrical power circuits against accidental contact by insulating the circuit or deenergizing it or by other effective means that would protect the employee (29CFR 1926.400(C)(1)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.

- OSHA Safety and Health Training Guidelines for Construction (available from the National Technical Information Service - Order No. PB-239-312/AS) comprised of a set of 15 guidelines to help construction employees establish a training program in the safe use of equipment, tools, and machinery on the job.
- OSHA-funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (list under the U.S. Department of Labor or under the state government section where states administer the own OSH programs).

ACCIDENT SUMMARY No. 12

Accident Type:	Fall from Elevation	
Weather Conditions:	Cool, Clear	
Type of Operation:	Exterior Renovation	
Size of Work Crew:	2	
Collective Bargaining	No	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Laborer	
Age & Sex:	22-Male	
Experience at this Type of Work:	2 Days	
Time on Project:	2 Hours	

BRIEF DESCRIPTION OF ACCIDENT

Two laborers were working on a motorized two-point suspension scaffold 70 feet above ground level without safety belts, lanyards, or lifelines. Three wire rope clips forming an "eye" for connecting the wire rope to the C. hook failed and that end of the scaffold came down. One employee fell to the ground, and the second employee at the other end was catapulted through an open window where he was pulled to safety by office workers. Two of the rope clips were still attached to the end of the rope after the accident. The inside tread of the third clip, which fell, was found to be stripped.

INSPECTION RESULTS

As result of the its investigation, OSHA issued citations for four alleged repeat violations of its construction standards.

OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS

1. All wire ropes, fiber and synthetic ropes, slings, hangers, platforms, and other supporting parts must be inspected before every installation. Periodic inspections also must be made while the scaffold is in use (29 CFR 1926.451(i)(7)).
2. On suspension scaffolds each employee must be protected by an approved safety life belt attached to the lifeline. The lifeline must be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines which will safely suspend the

employee in case of fall. The lifeline must be appropriately adjusted as the work progresses (29 CFR 1926.451(I)(8)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations covering construction
- Selected Occupational Fatalities Related to Powered, Two-Point Suspension Scaffolds/Powered Platforms as found in reports of OSHA Fatality/Catastrophe Investigations (available from the National Technical Information Service - Order No. PB83-194-050).
- OSHA-funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under the U.S. Labor Department or under the state government where states administer their own OSH programs)

ACCIDENT SUMMARY No. 13

Accident Type:	Collapse of Shoring	
Weather Conditions:	Clear	
Type of Operation:	Boring and Pipe Jacking Excavation	
Size of Work Crew:	4	
Collective Bargaining	Yes	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	No	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	Yes	
Employee Job Title:	Pipe Welder	
Age & Sex:	62-Male	
Experience at this Type of Work:	18 years	
Time on Project:	2½	

BRIEF DESCRIPTION OF ACCIDENT

Four employees were boring a hole and pushing a 20-inch pipe casing under a road. The employees were in an excavation approximately 9 feet wide, 32 feet long and 7 feet deep. Steel plates 8' x 15' x ¾", being used as shoring, were placed vertically against the north and south walls of the excavation at approximately a 30 degree angle. There were no horizontal braces between the steel plates. The steel plate on the south wall tipped over, pinning an employee (who was killed) between the steel plate and the pipe casing. At the time the plate tipped over, a backhoe was being operated adjacent to the excavation.

INSPECTION RESULTS

As a result of its investigation, OSHA issued a citation for two alleged serious violations of its construction standards.

OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS

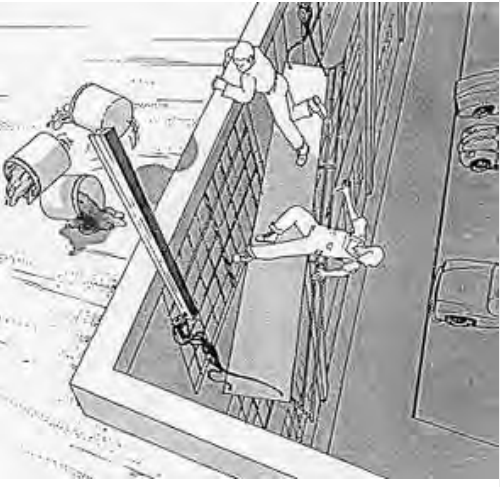
1. Provide an adequately constructed and braced shoring system for employees working in an excavation that may expose employees to the danger of moving ground (29 CFR 1926.651(c))

2. If heavy equipment is operated near an excavation, stronger shoring must be used to resist the extra pressure due to superimposed loads (29 CFR 1926.651(q))

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations covering construction.
- Excavation and Trenching Operations (OSHA 2226) which details OSHA excavation and trenching standards
- Safety and Health in Excavation and Trenching Operations (available from the National Audiovisual Center - Order No 689601), an instructional program with instructor's manual and 139 slides designed to provide greater knowledge and understanding of hazards in excavation and trenching.

ACCIDENT SUMMARY No. 14

Accident Type:	Fall, Different Level	
Weather Conditions:	Clear, Warm	
Type of Operation:	Painting Contractor	
Size of Work Crew:	2	
Collective Bargaining	No	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	No	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	Inadequate	
Employee Job Title:	Painter	
Age & Sex:	29-Male	
Experience at this Type of Work:	Unknown	
Time on Project:	1 month	

BRIEF DESCRIPTION OF ACCIDENT

Two employees were painting the exterior of a three-story building when one of the two outriggers on their two-point suspension scaffold failed. One painter safely climbed back onto the roof while the other fell approximately 35 feet to his death. The outriggers were inadequately counterweighted with three 5-gallon buckets containing sand and were not secured to a structurally sound portion of the building. Neither painter was wearing an approved safety belt and lanyard attached to an independent lifeline.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations for five serious and two other than serious violations of its construction standards. OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS


1. Develop and maintain a safety and health program to provide guidance for safe operations (29 CFR 1926.20(b)(1)).
2. Institute, a program for frequent and regular inspections of the job site, as well as materials and equipment by a competent person(s) (29 CFR 1926.20(b)(2)).
3. Instruct each employee on how to recognize and avoid unsafe conditions which apply to the work and work areas (29 CFR 1926.21(b)(2)).
4. Construct scaffolds and their components so that they can support at least four times the maximum intended load (29 CFR 1926.451(a)(7)).

5. Install outrigger tiebacks of $\frac{3}{4}$ inch rope, or equivalent, to a structurally sound portion of the building to provide a secondary means of anchorage (29 CFR 1926.451(i)(4)).
6. Require employees to wear approved safety belt and lanyard equipment attached to an independent lifeline that is attached to a substantial structural member (29 CFR 1926.451(i)(8)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains OSHA job safety and health rules and regulations (1926 and 1910) covering construction.
- "Selected Occupational Fatalities Related to Powered, Two-Point Suspension Scaffolds/ Powered Platforms as Found in Re-ports of OSHA Fatality/Catastrophe Investigations" (available from the National Technical Information Service - Order No. PB83-194-050).
- OSHA-funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under the U.S. Labor Department or under the state government section where states administer their own OSH programs).

ACCIDENT SUMMARY No. 15

Accident Type:	Crushed by Dump Truck Body	
Weather Conditions:	Clear, Warm	
Type of Operation:	General Contractor	
Size of Work Crew:	N/A	
Collective Bargaining	Yes	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Truck Driver	
Age & Sex:	25-Male	
Experience at this Type of Work:	2 Months	
Time on Project:	2 Weeks at Site	

BRIEF DESCRIPTION OF ACCIDENT

A truck driver was crushed and killed between the frame and dump box of a dump truck. Apparently a safety "overtravel" cable attached between the truck frame and the dump box malfunctioned by catching on a protruding nut of an air brake cylinder. This prevented the dump box from being fully raised, halting its progress at a point where about 20 inches of space remained between it and the truck frame. The employee, apparently assuming that releasing the cable would allow the dump box to continue up-ward, reached between the rear dual wheels and over the frame, and disengaged the cable with his right hand. The dump box then dropped suddenly, crushing his head. The employee had not received training or instruction in proper operating procedures and was not made aware of all potential hazards in his work.

INSPECTION RESULTS

Following its inspection, OSHA issued one citation for one alleged serious violation of its construction standards. Had the required training been provided to the employee, this fatality might have been prevented.

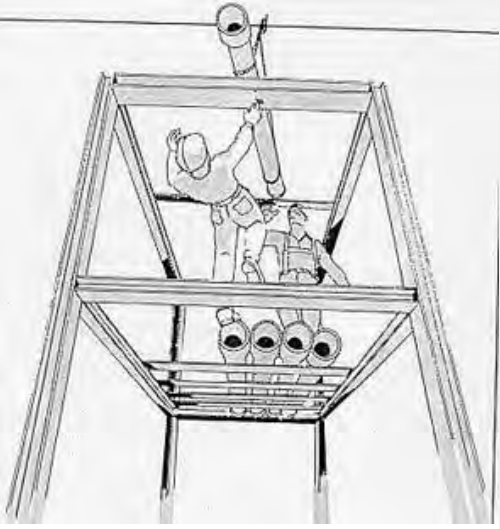
ACCIDENT PREVENTION RECOMMENDATIONS

Employees must be instructed to recognize and avoid unsafe conditions associated with their work (29 CFR 1926.21 (b)(2)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction. OSHA-funded free consultation services.
- Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under U.S. Labor Department or under the state government section where states administer their own OSHA programs).

ACCIDENT SUMMARY No. 16

Accident Type:	Fall from Elevation	
Weather Conditions:	Clear	
Type of Operation:	Plumbing Contractor	
Size of Work Crew:	30	
Collective Bargaining	Yes	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Plumber	
Age & Sex:	37-Male	
Experience at this Type of Work:	3 Weeks	
Time on Project:	2 Hours	

BRIEF DESCRIPTION OF ACCIDENT

Employees were working on structural steel, hoisting pipes from ground level to higher levels for storage. While guiding a pipe to be stored on the floor above, one employee walked backwards off the end of a stored pipe. He fell about 12 feet to a concrete deck, suffering a fatal head injury.

INSPECTION RESULTS

As a result of its investigation, OSHA issued a citation alleging one serious violation.

OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.


ACCIDENT PREVENTION RECOMMENDATIONS

1. Employers must require the wearing of appropriate personal protective equipment (safety belts) wherever employees are exposed to hazardous conditions. (29 CFR 1926.28(a).)
2. The derrick or erection floor must be solidly planked or decked over its entire surface except for access openings. Planking, or decking of equivalent strength, must be thick enough to carry the working load. Planking must not be less than 2 inches thick full size undressed and should be laid tight and secured to prevent movement. (29 CFR 1926.750(b)(1)(i).)
3. A safety railing of ½ inch wire rope or of equal strength must be installed approximately 42 inches high around the periphery of all temporary-planked or temporary metal-decked floors of tier buildings and other multi-floored structures during structural steel assembly. (29 CFR 1926.750(b)(1)(iii).)

SOURCES OF HELP

- construction Safety and Health Standards (OSHA 2207) which contains OSHA job safety and health rules and regulations (1926 and 1910) covering construction.
- OSHA Safety and Health Training guidelines for Construction (available from the National Technical Information Service Order No. PB-239-309/SET) designed to help construction employers establish a training program in the safe use of equipment, tools, and machinery on the job.
- OSHA - funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under the U.S. Labor Department or under the state government section where states administer their own OSH programs).
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Dr., Des Plaines, Ill. 60018 ((312) 297-4810).

ACCIDENT SUMMARY No. 18

Accident Type:	Caught by Rotating Part	
Weather Conditions:	Clear	
Type of Operation:	Telephone Line Installation	
Size of Work Crew:	3	
Collective Bargaining	No	
Competent Safety Monitor on Site:	Yes - Victim	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Boring Machine Operator	
Age & Sex:	56-Male	
Experience at this Type of Work:	10 Years	
Time on Project:	5 Days	

BRIEF DESCRIPTION OF ACCIDENT

A three-man crew was installing an underground telephone cable in a residential area. They had just completed a bore hole under a driveway using a horizontal boring machine. The bore hole rod had been removed from the hole. While the rod was still rotating, the operator straddled it and stooped over to pick it up. His trouser leg became entangled in the rotating rod and he was flipped over. He struck tools and materials, sustaining fatal injuries.

INSPECTION RESULTS

Following its inspection, OSHA issued one citation for one alleged serious violation of its construction standards. Had the equipment been properly guarded, this fatality might have been prevented.


ACCIDENT PREVENTION RECOMMENDATIONS

1. Employees must be instructed to recognize and avoid unsafe conditions associated with their work (29.CFR 1926.21(b)(2)).
2. Guards must be installed on moving parts of equipment with which employees may come into contact (29 CFR 1926.300(b)(2)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which maintains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.
- OSHA-funded free consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under U.S. Labor Department or under the state government section where states administer their own OSHA programs).

ACCIDENT SUMMARY No. 19

Accident Type:	Crushing	
Weather Conditions:	Snowing	
Type of Operation:	Paving Constructor	
Size of Work Crew:	5	
Collective Bargaining	No	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Operating Engineer	
Age & Sex:	29-Male	
Experience at this Type of Work:	1 Years	
Time on Project:	1 Week	

BRIEF DESCRIPTION OF ACCIDENT

An employee was operating a bulldozer at the top edge of a sloped excavation for a six-foot deep drainage ditch. The bulldozer began to slide down the side of the snow and ice covered excavation. It tipped over on its side, pinning the operator under the roll bars.

INSPECTION RESULTS

OSHA's inspection resulted in one citation for one alleged serious violation of its construction standards. If the bulldozer operator had been wearing a seat belt, as required by OSHA standards, this fatality might have been prevented.

ACCIDENT PREVENTION RECOMMENDATIONS

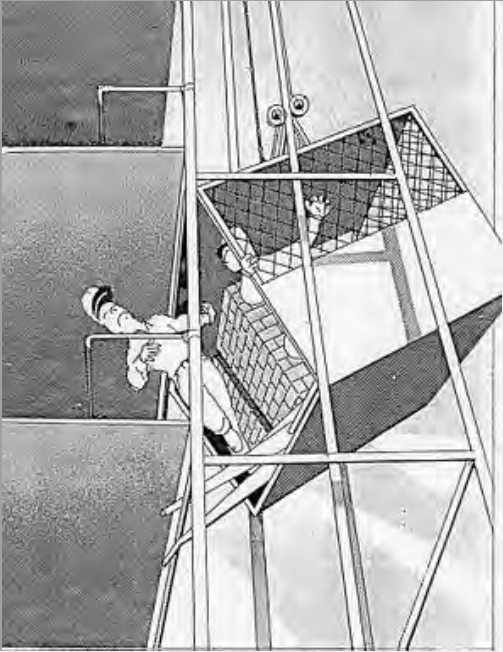
1. Employees must be instructed to recognize and avoid unsafe conditions associated with their work (29 CFR 1926.21(b)(2)).
2. Employers must require employees to wear appropriate personal protective equipment - such as a seatbelt - whenever it is necessary to reduce a hazard (29 CFR 1926.28(a)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.
- OSHA-funded free consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice

(listed under U.S. Labor Department or under the state government section where states administer their own OSHA programs).

ACCIDENT SUMMARY No. 20

Accident Type:	Fall from Elevation	
Weather Conditions:	Snowing	
Type of Operation:	Mason Contractor	
Size of Work Crew:	26	
Collective Bargaining:	Yes	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Mason Tender	
Age & Sex:	44-Male	
Experience at this Type of Work:	20 Years	
Time on Project:	3 Months	

BRIEF DESCRIPTION OF ACCIDENT

A laborer and his foreman were riding a material hoist carrying two skids of bricks up to the work floor. The skid jack handle fell and jammed into the interior cross bracing bar of the hoist at the fifth floor level. At the sixth floor level, the foreman jumped off the hoist. He struck the protection platform bar and was subsequently knocked into the hoist shaft. He fell 60 feet to his death.

INSPECTION RESULTS

Following inspection, OSHA cited the employer for one serious violation of its construction standards. Had the OSHA regulation prohibiting personnel from riding material hoists been followed, this accident would not have occurred.

ACCIDENT PREVENTION RECOMMENDATIONS


1. Employees must be instructed to recognize and avoid unsafe conditions associated with their work (29 CFR 1926.21(b)(2)).
2. No one may ride on material hoists except to inspect or maintain them (29 CFR 1926.552(b)(1)(ii)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.

- OSHA-funded free consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under U.S. Labor Department or under the state government section where states administer their own OSHA programs).

ACCIDENT SUMMARY No. 34

Accident Type:	Caught in Machinery	
Weather Conditions:	Clear	
Type of Operation:	Well Drilling	
Size of Work Crew:	2	
Collective Bargaining	No	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Company Vice President	
Age & Sex:	30-Male	
Experience at this Type of Work:	Unknown	
Time on Project:	5 Hours	

BRIEF DESCRIPTION OF ACCIDENT

Two employees were attempting to adjust the brakes on a backhoe. The victim told the backhoe operator to raise the wheels off the ground with the front bucket and the outriggers, put the backhoe in gear at idle speed and step on the brakes. The victim then crawled under the machine and began to adjust the brakes. There was a 36-inch space from the ground to the drive shaft. Five minutes later another employee discovered the victim limp under the backhoe with the hood of his rain jacket wrapped around the drive shaft. The employee's neck had been broken by the jacket wrapping around the backhoe drive shaft.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Before adjusting backhoe brakes, turn off the machine and set the controls in neutral and the brake and cut-off pedals in the uppermost position. Block the wheels, except for the one to be adjusted, as recommended by the operator's manual.
2. Train employees to recognize and avoid unsafe conditions associated with their work (29 CFR 1926.21(b)(2)).
3. Develop and implement a training program for employees on the proper procedures for adjusting and bleeding backhoe brakes.

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.

- OSHA-funded free consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under U.S. Labor Department or under the state government section where states administer their own OSHA programs).

ACCIDENT SUMMARY No. 36

Accident Type:	Asphyxiation	
Weather Conditions:	Warm, partly cloudy	
Type of Operation:	Sandblasting/painting contractor	
Size of Work Crew:	4	
Collective Bargaining	No	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Limited	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	Inadequate	
Employee Job Title:	Sandblaster/Painter	
Age & Sex:	56-Male	
Experience at this Type of Work:	5 years on a permanently assigned crew	
Time on Project:	45 minutes	

BRIEF DESCRIPTION OF ACCIDENT

A contract employee was assigned to sandblast the inside of a reactor vessel during turnaround activities at a petrochemical refinery. Instead of relying on the contract company's own air compressors in accordance with the contractor's policy, the contract foreman connected the employee's supplied air respirator to a hose containing what he thought was plant air. Instead it was nitrogen. Both hoses were identical except for markings at the shutoff valve. The sandblaster entered the vessel, descended to the bottom, placed the respirator hood on his head and was overcome.

ACCIDENT PREVENTION RECOMMENDATIONS

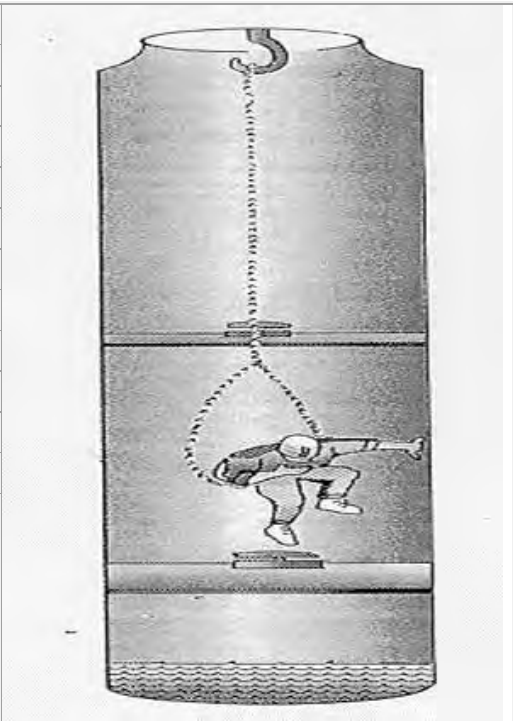
1. Employers must instruct employees to recognize and avoid unsafe conditions associated with their work (29 CFR 1926.21(b)(2)).
2. Contractors should follow a policy of using only their own air compressors or breathing air cylinders for their employees.
3. Middle and/or upper management personnel should routinely check first line supervisors to insure they are following established company safety policies.

SOURCES OF HELP

- Safety and Health Requirements for Working in Confined Space, a slide-tape training program including instructor's guide and class handouts, helps employees recognize potential sources of danger in confined spaces and explains how to select and use proper protective clothing and equipment. Available from the National Audio Visual Center, order No. A12793, for \$90, prepaid, 8700 Edgeworth Dr., Capitol Heights, MD 20743-3701, telephone (301) 763-1896.
- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.
- OSHA-funded free consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (Listed under U.S. Labor Department or under the state government section where states administer their own OSHA programs).

ACCIDENT SUMMARY No. 39

Accident Type:	Asphyxiation
Weather Conditions:	Warm
Type of Operation:	Boring, Jacking
Size of Work Crew:	6
Collective Bargaining	No
Competent Safety Monitor on Site:	No
Safety and Health Program in Effect:	No
Was the Worksite Inspected Regularly:	No
Training and Education Provided:	No
Employee Job Title:	Laborer
Age & Sex:	23-Male
Experience at this Type of Work:	1 Day
Time on Project:	1 Hour



BRIEF DESCRIPTION OF ACCIDENT

An employee sitting in a looped chain was lowered approximately 17 feet into a 21-foot deep manhole. Twenty seconds later he started gasping for air and fell from the chain seat face down into the accumulated water at the bottom of the manhole. An autopsy determined oxygen deficiency as the cause of death.

ACCIDENT PREVENTION RECOMMENDATIONS


1. Instruct employees to recognize and avoid unsafe conditions associated with their work environment (29 CFR 1926.21(b)(2)).
2. Instruct employees on hazards involved in entering confined or enclosed spaces (29 CFR 1926.21(b)(6)(i) and (b)(6)(ii)).
3. Provide and require employees to use appropriate respiratory protection (29 CFR 1926.103(a)(1) and 1910.134).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.
- OSHA-funded free consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice

(listed under U.S. Labor Department or under the state government section where states administer their own OSHA programs).

ACCIDENT SUMMARY No. 40

Accident Type:	Electrocution	
Weather Conditions:	Sunny/Clear	
Type of Operation:	Fence Construction	
Size of Work Crew:	5	
Collective Bargaining	No	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Laborer	
Age & Sex:	25-Male	
Experience at this Type of Work:	3 Months	
Time on Project:	1 Day	

BRIEF DESCRIPTION OF ACCIDENT

Five employees were constructing a chain link fence in front of a house and directly below a 7200-volt energized power line. They were installing 21-foot sections of metal top rail on the fence. One employee picked up a 21-foot section of top rail and held it up vertically. The top rail contacted the 7200-volt line, and the employee was electrocuted.

INSPECTION RESULTS

Following its inspection, OSHA determined that the employee who was killed had never received any safety training from his employer nor any specific instruction in avoiding the hazards posed by overhead power lines. The agency issued two serious citations for the training deficiencies.

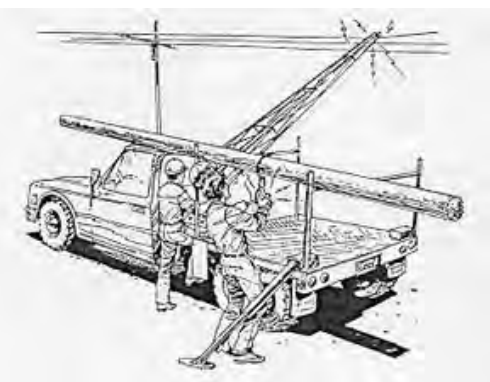
ACCIDENT PREVENTION RECOMMENDATIONS

1. Employers must instruct employees to recognize and avoid unsafe conditions applicable to their work environment [29 CFR 1926.21(b)(2)].
2. Employers must not permit employees to work in proximity to any part of an electrical power circuit when the employee could contact it during the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means [29 CFR 1910.416(a)(1)].

SOURCES OF HELP

- **OSHA General Industry Standards** [CFR parts 1900-1910] and **OSHA Construction Standards** [CFR Part 1926] which together include all OSHA job safety and health rules and regulations covering construction.
- **Electrical Standards for Construction** (OSHA 3097) which highlights electrical safety rules for construction.
- **Ground-Fault Protection on Construction Sites** (OSHA 3007) which explains ways to guard against electrical shock on the construction site through use of ground-fault circuit interrupters.
- OSHA-funded free consultation services listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.

ACCIDENT SUMMARY No. 44

Accident Type:	Electrocution	
Weather Conditions:	Clear/Dry	
Type of Operation:	Pole Setting	
Size of Work Crew:	2	
Collective Bargaining	No	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Material Hauler	
Age & Sex:	55-Male	
Experience at this Type of Work:	5 Years	
Time on Project:	1 Day	

BRIEF DESCRIPTION OF ACCIDENT

One employee was unloading a 40-foot wood telephone pole from a pipe rack mounted on a truck crane. The truck operator raised the 17-foot boom to provide sufficient distance for the employee to place a cable sling around the pole and then attach the sling to the crane hook. However, in raising the boom, the operator made contact with overhead power lines. The victim reached for the metal bicycle-chain style come-along which secured the pole to the truck rack and received a fatal electrical shock.

* Firm had a safety and health training program, but it had not been updated to cover changes in pole setting procedures.

INSPECTION RESULTS

Following its inspection, OSHA cited the employer for four serious violations involving training, hazard identification, and minimum safe distances from overhead electrical lines.


ACCIDENT PREVENTION RECOMMENDATIONS

1. Instruct employees to recognize and avoid unsafe conditions applicable to their work [29 CFR 1926.21(b)(2)].
2. Determine existing conditions, such as the voltage of overhead power lines, by inspection or test before beginning work [29 CFR 1926.950(b) (1)].
3. Do not operate equipment where any part is within the prescribed distance of electrical power lines rated over 50KV [29 CFR 1926.550(a)(15)(ii)].
4. When in transit, with no load and the boom lowered, crane operators must maintain a clearance of four feet for voltages less than 50KV, 10 feet for voltages between 50KV and 345KV and 16 feet for voltages up to and including 750KV [29 CFR 1926.550 (a)(15)(iii)].

SOURCES OF HELP

- OSHA General Industry Standards [CFR parts 1900-1910] and OSHA Construction Standards [CFR Part 1926] which together include all OSHA job safety and health rules and regulations covering construction.
- Electrical Standards for Construction (OSHA 3097) which highlights electrical safety rules for construction.
- OSHA-funded free consultation services listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.

ACCIDENT SUMMARY No. 48

Accident Type:	Struck by Nail	
Weather Conditions:	N/A	
Type of Operation:	Remodeling	
Size of Work Crew:	2	
Collective Bargaining	No	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	No	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Maintenance	
Age & Sex:	32-Male	
Experience at this Type of Work:	1 Day	
Time on Project:	1 Day	

BRIEF DESCRIPTION OF ACCIDENT

Two employees were doing remodeling construction and were building a wall. One of the workers was killed when he was struck by a nail fired from a powder-actuated tool. The tool operator, while attempting to anchor plywood to a 2" x 4" stud, fired the tool. The nail penetrated the stud and the plywood partition prior to striking the victim.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations for three serious violations. Had employees been trained in the use of powder-actuated tools and had precautions been taken to prevent the nail from passing through the wall, the accident probably would not have occurred.

ACCIDENT PREVENTION RECOMMENDATIONS

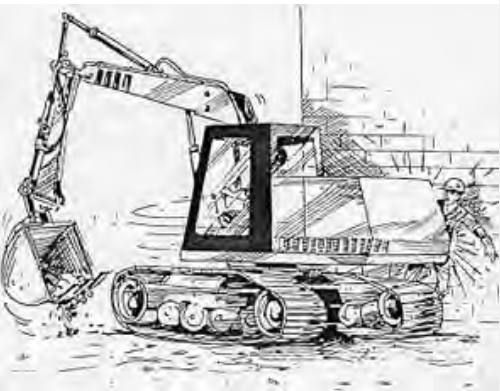
1. Employees using powder-actuated tools must be trained in the operation of the particular tool. [29 CFR 1926.302(e)(1)].
2. Driving into materials easily penetrated must be avoided unless materials are backed by a substance that will prevent the nail from passing completely through and creating a flying missile hazard on the other side [29 CFR 1926.302(e)(8)].
3. Operators and assistants using powder-actuated tools must be safeguarded with eye protection [28 CFR 1926.302(e)(12)]

SOURCES OF HELP

- OSHA General Industry Standards [29 CFR Parts 1900-1910] and OSHA Construction Standards [29 CFR Part 1926] which together include all OSHA job safety and health rules and regulations covering construction.

- OSHA-funded free consultation services listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Drive, Des Plaines, IL 60018, 312/297-4810

ACCIDENT SUMMARY No. 50

Accident Type:	Caught between Backhoe Superstructure and Concrete Wall	
Weather Conditions:	Clear/Cool	
Type of Operation:	Excavation Contractor	
Size of Work Crew:	9	
Collective Bargaining:	Yes	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	No	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Truck Driver	
Age & Sex:	34-Male	
Experience at this Type of Work:	Unknown	
Time on Project:	4 Days	

BRIEF DESCRIPTION OF ACCIDENT

The contractor was operating a backhoe when an employee attempted to walk between the swinging superstructure of the backhoe and a concrete wall. As the employee approached the backhoe from the operator's blind side, the superstructure hit the victim crushing him against the wall.

INSPECTION RESULTS

OSHA issued two citations to the employer. One was based on failure to train employees in safe work practices regarding the dangers of construction machinery. The other citation was for failure to erect barricades to prevent entry into a swinging superstructure's radius.


ACCIDENT PREVENTION RECOMMENDATIONS

1. Instruct each employee on the danger of passing between swinging superstructures of large construction equipment and solid objects at the demolition site [29 CFR 1926.21(b)(2)].
2. Provide each employee employment and place of employment which are free from recognized hazards causing or likely to cause death or serious physical harm to his employees [OSH Act Sec. 5(a)(1)].

SOURCES OF HELP

- OSHA General Industry Standards [CFR parts 1900-1910] and OSHA Construction Standards [CFR Part 1926] which together include all OSHA job safety and health rules and regulations covering construction.
- OSHA-funded free consultation services listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.
- OSHA Safety and Health Training Guidelines for Construction (Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; 703/487-4650; Order No. PB-239-312/AS): a set of 15 guidelines to help construction employers establish a training program in the safe use of equipment, tools, and machinery on the job

ACCIDENT SUMMARY No. 55

Accident Type:	Trench Cave-in	
Weather Conditions:	Good	
Type of Operation:	Sewer Line Connection	
Size of Work Crew:	1 Plumbing Company Employee/ 1 Independent Backhoe Operator	
Collective Bargaining:	No	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	No	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Laborer	
Age & Sex:	44-Male	
Experience at this Type of Work:	1 Year	
Time on Project:	1 Day	

BRIEF DESCRIPTION OF ACCIDENT

A plumbing company employee and an independent backhoe operator were making a sewer line connection in a 13-foot deep trench when a portion of the trench wall caved in burying the employee. The backhoe operator was buried up to his chest in the trench.

INSPECTION RESULTS

As a result of its investigation, OSHA issued a citation to the plumbing company for not shoring up, sloping or supporting the sides of a trench in unstable or soft material.

ACCIDENT PREVENTION RECOMMENDATIONS

1. The sides of trenches in unstable or soft material more than five feet in depth should be shored, sheeted, braced, sloped or otherwise supported [29 CFR 1926.652(a)].
2. The employer must instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards [29 CFR 1926.21(b)(2)].

SOURCES OF HELP

- OSHA General Industry Standards [CFR parts 1900-1910] and OSHA Construction Standards [CFR Part 1926] which together include all OSHA job safety and health rules and regulations covering construction.
- OSHA-funded free consultation services listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.
- OSHA Safety and Health Training Guidelines for Construction (Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; 703/487-4650; Order No. PB-239-312/AS): a set of 15 guidelines to help construction employers establish a training program in the safe use of equipment, tools, and machinery on the job.
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Drive, Des Plaines, IL 60018, 312/297-4810.

ACCIDENT SUMMARY No. 57

Accident Type:	Electrocution	
Weather Conditions:	Clear/Hot/Humid	
Type of Operation:	Window Shutter Installers	
Size of Work Crew:	2	
Collective Bargaining	N/A	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	Partial	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	Some	
Employee Job Title:	Helper	
Age & Sex:	17-Male	
Experience at this Type of Work:	One Month	
Time on Project:	One Month	

BRIEF DESCRIPTION OF ACCIDENT

One employee was climbing a metal ladder to hand an electric drill to the journeyman installer on a scaffold about five feet above him. When the victim reached the third rung from the bottom of the ladder he received an electric shock that killed him.

The investigation revealed that the extension cord had a missing grounding prong and that a conductor on the green grounding wire was making intermittent contact with the energizing black wire thereby energizing the entire length of the grounding wire and the drill's frame. The drill was not double insulated.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations for violations of construction standards.


ACCIDENT PREVENTION RECOMMENDATIONS

1. Use approved ground fault circuit interrupters or an assured equipment grounding conductor program to protect employees on construction sites [29 CFR 1926.404(b)(1)].
2. Use equipment that provides a permanent and continuous path from circuits, equipment, structures, conduit or enclosures to ground [29 CFR 1926.404(d)(6)].
3. Inspect electrical tools and equipment daily and remove damaged or defective equipment from use until it is repaired [29 CFR 1926.404(b)(iii)(c)].

SOURCES OF HELP

- OSHA General Industry Standards [CFR parts 1900-1910] and OSHA Construction Standards [CFR Part 1926] which together include all OSHA job safety and health rules and regulations covering construction.
- OSHA-funded free consultation services listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.
- OSHA Safety and Health Training Guidelines for Construction (Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; 703/487-4650; Order No. PB-239-312/AS): a set of 15 guidelines to help construction employers establish a training program in the safe use of equipment, tools, and machinery on the job.
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Drive, Des Plaines, IL 60018, 708/297-4810.

ACCIDENT SUMMARY No. 58

Accident Type:	Fall and Drowning	
Weather Conditions:	Clear/Windy	
Type of Operation:	Construction	
Size of Work Crew:	17	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Written	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Laborer	
Age & Sex:	20-Male	
Experience at this Type of Work:	2 Years	
Time on Project:	4 Months	

BRIEF DESCRIPTION OF ACCIDENT

Employee was suspended to the worksite in a harness made of lightweight chain on the end of a crane load line. During the operation the load line separated from a revolving drum due to improper crane operation. The victim was dropped into approximately 40 feet of water and was drowned. The supervisor in charge at time of the accident was the designated competent person at the site.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations for violations of nine standards.

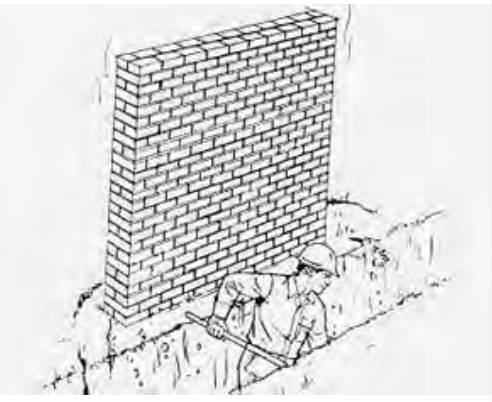
ACCIDENT PREVENTION RECOMMENDATIONS

1. The contractor should provide conventional means such as ladders, personnel hoists, aerial lifts, elevated work platforms or scaffolds for employees to reach the worksite [29 CFR ; 926.550(g)(2)].
2. The contractor should perform a trial lift on the equipment to determine that all systems, controls and safety devices are functioning properly immediately prior to hoisting employee to worksite [29 CFR 1926.550(g)(5)].
3. The contractor should not permit inadequately trained employees to operate equipment or machinery [29 CFR 1926.20(b)(4)].
4. Contractor should provide appropriate personal protective equipment such as safety belts and lanyards for employees in operations where there is exposure to hazardous conditions [29 CFR 1926.28(a)].
5. Employer should comply with manufacturer's specifications applicable to operation of cranes or derricks [29 CFR 1926.550(a)(1)].

SOURCES OF HELP

- OSHA General Industry Standards [CFR parts 1900-1910] and OSHA Construction Standards [CFR Part 1926] which together include all OSHA job safety and health rules and regulations covering construction.
- For information on OSHA-funded free consultation services call the nearest OSHA area office listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.
- OSHA Safety and Health Training Guidelines for Construction (Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; 703/487-4650; Order No. PB-239-312/AS): a set of 15 guidelines to help construction employers establish a training program in the safe use of equipment, tools, and machinery on the job.
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Drive, Des Plaines, IL 60018, 312/297-4810.

ACCIDENT SUMMARY No. 59

Accident Type:	Struck by Falling Wall	
Weather Conditions:	Clear/Wet Soil	
Type of Operation:	Trenching	
Size of Work Crew:	2	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	Inadequate	
Was the Worksite Inspected Regularly:	No, short duration	
Training and Education Provided:	Some	
Employee Job Title:	Laborer	
Age & Sex:	27-Male	
Experience at this Type of Work:	1 Year	
Time on Project:	1 Day	

BRIEF DESCRIPTION OF ACCIDENT

An employee was in the process of locating an underground water line. A trench had been dug approximately 4 feet deep along side a brick wall 7 feet high and 5 feet long. The brick wall collapsed onto the victim who was standing in the trench. The injuries were fatal.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations for violation of the standard.

ACCIDENT PREVENTION RECOMMENDATIONS

The contractor should not permit employees to excavate below the level of the base of foundation footings when walls are unpinned [29 CFR 1926.651(i)(1)]

SOURCES OF HELP

- **OSHA 2202 Construction Industry Digest** – includes all OSHA construction standards and those general industry standards that apply to construction. Order No. 029-016-00151-4, (\$2.25). Available from the Superintendent of Documents, Government Printing Office, Washington DC 20402-9325, phone (202) 512-1800. Make checks payable to Superintendent of Documents. For phone orders, Visa® or MasterCard®.
- **OSHA 2254 Training Requirements in OSHA Standards and Training Guidelines** – includes all OSHA construction standards and those general industry standards that apply to construction. Order No. 029-016-00160-3, (\$6.00). Available from the Superintendent of Documents, Government Printing Office, Washington DC 20402-9325, phone (202)

512-1800. Make checks payable to Superintendent of Documents. For phone orders, Visa® or MasterCard®.

- **OSHA Safety and Health Guidelines for Construction** (Available from the National Information Service, 5285 Port Royal Road, Springfield, VA 22161; (703) 605-6000 or (800) 553-6847; Order No. PB-239-312/AS, \$27). Guidelines to help construction employers establish a training program in the safe use of equipment, tools, and machinery on the job.
- For information on OSHA-funded free consultation services call the nearest OSHA area office listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Drive, Des Plaines, IL 60018, 708/297-4810.
- OSHA Safety and Health Training Guidelines for Construction (Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; 703/487-4650; Order No. PB-239-312/AS): guidelines to help construction employers establish a training program in the safe use of equipment, tools, and machinery on the Job.

ACCIDENT SUMMARY No. 60

Accident Type:	Electrocution	
Weather Conditions:	Indoor Work	
Type of Operation:	Installing and Troubleshooting overhead lamps	
Size of Work Crew:	15	
Competent Safety Monitor on Site:	Yes	
Safety and Health Program in Effect:	Inadequate	
Was the Worksite Inspected Regularly:	Yes	
Training and Education Provided:	No	
Employee Job Title:	Electrician	
Age & Sex:	53-Male	
Experience at this Type of Work:	Journeyman	
Time on Project:	1 Month	

BRIEF DESCRIPTION OF ACCIDENT

The employee was attempting to correct an electrical problem involving two non-operational lamps. He proceeded to the area where he thought the problem was. He had not shut off the power at the circuit breaker panel nor had he tested the wires to see if they were live. He was electrocuted when he grabbed the two live wires with his left hand and then fell from the ladder.

INSPECTION RESULTS

As a result of its investigation, OSHA Issued citations alleging three serious violations. OSHA's construction standards include several requirements which, if they had been followed here, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS

1. The employer should not allow work to be done on electrical circuits unless an effective lock-out/tag-out program is implemented [29 CFR 1926.416(a)(1)].
2. The employer should not allow work to be done on energized electrical circuits or circuits which are not positively de-energized or tagged out [29 CFR 1926.417(a) and 417(c)].


SOURCES OF HELP

- OSHA 2207 Construction Industry Manual -- includes all OSHA construction standards and those general industry standards which relate to construction. Stock number 029-016-

00-122-1, (521). Available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402-9325, phone.

- 202-783-3238. Make checks payable to Superintendent of Documents. For phone orders, you may use a GPO deposit account or Visa or MasterCard.
- For Information on OSHA-funded free consultation services call the nearest OSHA area office listed in telephone directories under U.S. Labor Department or under the state government section in states administering their own OSHA programs.
- OSHA Safety and Health Training Guidelines for Construction (Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; 703/487-4650; Order No. PB-239-312/AS) \$19, to help construction employers establish a training program.
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Drive, Des Plaines, IL 60018, (phone 708-297-4810).

ACCIDENT SUMMARY No. 61

Accident Type:	Trench Collapse	
Weather Conditions:	Fair	
Type of Operation:	Excavation Work	
Size of Work Crew:	2	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	No	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	Inadequate	
Employee Job Title:	Laborer	
Age & Sex:	51-Male	
Experience at this Type of Work:	6 Months	
Time on Project:	2 Days	

BRIEF DESCRIPTION OF ACCIDENT

An employee was working in a trench 4 feet wide and 7 feet deep. About 30 feet away a backhoe was straddling the trench when the backhoe operator noticed a large chunk of dirt falling from the side wall behind the worker in the trench, he called out a warning. Before the worker could climb out, 6 to 8 feet of the trench wall had collapsed on him and covered his body up to his neck. He suffocated before the backhoe operator could dig him out. There were no exit ladders. No sloping, shoring or other protective system had been used in the trench.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations alleging three serious violations. OSHA's construction standards include several requirements which, if they had been followed here, might have prevented this fatality.

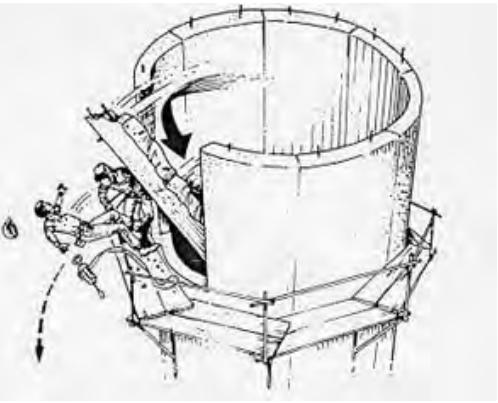
ACCIDENT PREVENTION RECOMMENDATIONS

1. Instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to the work environment [29 CFR 1926.21(b)(2)].
2. Provide protection from cave-ins by an adequate protective system [29 CFR 1926.652(a)(1)].
3. Provide a means of egress within 25 feet of employees in a trench 4 feet or more deep, such as a ladder or stairway [29 CFR 1926.651(c)(2)].

SOURCES OF HELP

- Title 29 Code of Federal Regulations (CFR) Part 1926 -- OSHA construction standards, in particular Subpart P Excavations. The OSHA standards are available at www.osha.gov
- For Information on OSHA-funded free consultation services use the A-Z index to find state locate "Consultation Services" at www.osha.gov.
- For information about construction resources use the A-Z index to find the construction page at www.osha.gov
- For the "Small Business Handbook" use the A-Z index to find its link at www.osha.gov
- Courses in construction safety are offered by the OSHA's Directorate of Training and Education. Course and contact information is listed at www.osha.gov under the Training tab.

ACCIDENT SUMMARY No. 64

Accident Type:	Fall	
Weather Conditions:	Good	
Type of Operation:	Demolition	
Size of Work Crew:	5	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	Inadequate	
Employee Job Title:	Laborer	
Age & Sex:	30-Male	
Experience at this Type of Work:	9 Days	
Time on Project:	3 Days	

BRIEF DESCRIPTION OF ACCIDENT

An employee was working on a scaffold near the top of a 250-foot smoke stack when a section of concrete being removed fell onto the scaffold, knocking the employee off. The employee was not tied off with a safety belt and lanyard and fell to the ground below.

INSPECTION RESULTS

As a result of its investigation of the accident, OSHA issued citations alleging two willful and several serious violations. OSHA's construction standards include requirements which, if they had been followed here, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS


1. The employer must install standard guardrails (toprail, midrail and toeboards) on all open sides and ends of the bracket scaffold around the top of the smoke stack. [29 CFR 1926.451(a)(4)].
2. The employer must provide training to inform employees of potential hazards while working on the scaffold. [29 CFR 1926.21(b)(2)].
3. The employer must provide a positive procedure to ensure that concrete sections fall inside, instead of outside, the smoke stack. [Section 5(a)(1) of the OSH Act].

SOURCES OF HELP

- Title 29 Code of Federal Regulations (CFR) Part 1926 - OSHA construction standards. Revised 7/1/92. Stock number 869-017-00122-1 (\$14). Available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402-9325, Phone 202/783-3238. For phone orders you may use a GPO deposit account. Visa, MasterCard or checks made payable to Superintendent of Documents.

- For information on OSHA-funded free consultation services call the nearest OSHA area office listed in telephone directories under U.S. Labor Department or under the state government section in states administering their own OSHA programs.
- OSHA Safety and Health Training Guidelines for Construction (Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; phone 703/487-4650; Order No. PB-239-312/AS, \$19.00) to help construction employees establish a training program.
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Drive, Des Plaines, IL 60018 (phone 708/297-4610).

ACCIDENT SUMMARY No. 67

Accident Type:	Asphyxiation	
Weather Conditions:	Clear/Cool	
Type of Operation:	Painting/Sand Blasting	
Size of Work Crew:	3	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Sandblaster	
Age & Sex:	31-Male	
Experience at this Type of Work:	5 Months	
Time on Project:	10 Days	

BRIEF DESCRIPTION OF ACCIDENT

Three employees were sandblasting portions of a heat exchanger in a manufacturing plant, preparing the surface for paint. The job was almost finished except for some touch-up work. The air compressor used to supply breathing air to the sand-blasters' hoods was sent to another job. The workers hooked their supply hoses into the plant's air system without clearing it with the plant's management.

The plant operators, not knowing the plant air was being used for breathing air, shut down the compressor for scheduled maintenance. This caused the nitrogen back-up system to come on line to maintain air pressure.

One sandblaster was asphyxiated from the nitrogen being fed into his hood.

INSPECTION RESULTS

Following an inspection, OSHA issued citations for two serious and two other-than-serious violations of OSHA standards.

ACCIDENT PREVENTION RECOMMENDATIONS


1. Ensure that employees are thoroughly trained when required to use respirators in atmospheres immediately dangerous to life, in accordance with 29 Code of Federal Regulations (CFR) 1926.103(c)(1).

2. Ensure that the compressor used to supply breathing air has a high-temperature or carbon monoxide alarm or both, in accordance with 29 CFR 1926.103(f).
3. WARNING: Nitrogen back-up systems are often used as the back-up system for compressed air systems. Always determine the type of back-up system before using any air system for breathing purposes.
4. Ensure that frequent and regular inspections of the job site are being done, in accordance with 29 CFR 1926.20(b)(2).
5. Ensure that employees are trained in hazard recognition and avoidance, in accordance with 29 CFR 1926.21(b)(2).

SOURCES OF HELP

- OSHA Construction Standards [29 CFR Part 1926], which include all OSHA job safety and health rules and regulations covering construction, may be purchased from the Government Printing Office, phone (202) 512-1800, fax (202) 512-2250, order number 869022-00114-1, \$33.
- OSHA-funded free consultation services listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.
- OSHA Safety and Health Training Guidelines for Construction, Volume III (Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; phone (703) 487-4650; Order No. PB-239-312/AS, \$25) to help construction employers establish a training program.
- Courses in construction safety are offered by the OSHA Training Institute, 1555 Times Drive, Des Plaines, IL 60018, 847/297-4810.
- OSHA regulations, documents and technical information also are available on CD-ROM, which may be purchased from the Government Printing Office, phone (202) 512-1800 or fax (202) 5122250, order number 729-13-00000-5; cost \$79 annually; \$28 quarterly. That information also is on the Internet World Wide Web at <http://www.osha.gov/>

ACCIDENT SUMMARY No. 68

Accident Type:	Fall (Thrown from)	
Weather Conditions:	Unknown	
Type of Operation:	Cleaning, Replacing and Caulking Brick	
Size of Work Crew:	6	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	Yes	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	Yes	
Employee Job Title:	Laborer	
Age & Sex:	45-Male	
Experience at this Type of Work:	Unknown	
Time on Project:	3 Weeks	

BRIEF DESCRIPTION OF ACCIDENT

Employee was operating an aerial lift, with an extendable boom rotating aerial work platform. He was thrown from the basket while moving the machine. The boom was fully extended and the machine apparently ran over some bricks, causing the boom to flex or spring, throwing the employee from the basket. The fall was about 37 feet to a concrete surface. The employee died from severe head and chest injuries.

The foreman was not on the site at the time.

ACCIDENT PREVENTION RECOMMENDATIONS

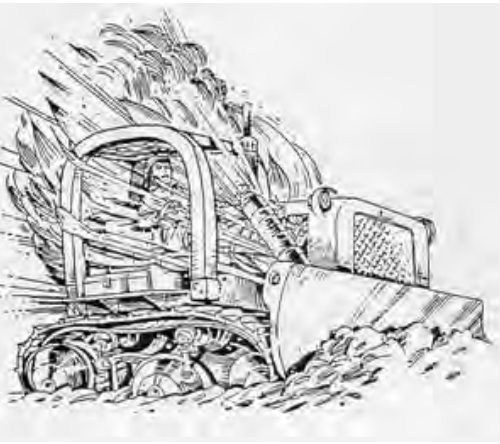
1. Have a competent person conduct frequent regular inspections of the worksite, in accordance with 29 Code of Federal Regulations (CFR) 1926.20(b)(2).

2. Permit only those employees qualified by training to operate equipment and machinery, in accordance with 1926.20(b)(4).
3. Instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his or her work environment, in accordance with 1926.21 (b)(2).
4. Prohibit unauthorized persons from operating aerial lifts, in accordance with 1926.556(b)(2)(ii).
5. Require the wearing of a body belt and lanyard at all times while in this type of device, in accordance with 1926.556(b)(2)(v)

SOURCES OF HELP

- OSHA Construction Standards [29 CFR Part 1926], which include all OSHA job safety and health rules and regulations covering construction, may be purchased from the Government Printing Office, phone (202) 512-1800, fax (202) 512-2250, order number 869022-00114-1, \$33.
- OSHA-funded free consultation services listed in telephone directories under U.S. Labor Department or under the state government section where states administer their own OSHA programs.
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ACCIDENT SUMMARY No. 69

Accident Type:	Death due to burns	
Weather Conditions:	Unknown	
Type of Operation:	Excavating for building a road	
Size of Work Crew:	2	
Competent Safety Monitor on Site:	No	
Safety and Health Program in Effect:	No	
Was the Worksite Inspected Regularly:	No	
Training and Education Provided:	No	
Employee Job Title:	Bulldozer Operator	
Age & Sex:	44-Male	
Experience at this Type of Work:	15 years	
Time on Project:	2 days	

BRIEF DESCRIPTION OF ACCIDENT

A bulldozer operator was preparing a road bed by using the machine to lift trees out of the way. A hydraulic line to the right front hydraulic cylinder ruptured, spraying hydraulic fluid onto the engine manifold and into the operator's compartment. Upon contact with the hot manifold, the hydraulic fluid ignited, engulfing the operator in flames. The operator died from the burns he received.

INSPECTION RESULTS

Following an inspection, OSHA issued citations for two serious violations of OSHA standards:

1. Frequent and regular inspections of equipment were not made by competent persons designated by the employer in accordance with 29 Code of Federal Regulations (CFR) 1926.20(b)(2). It was determined that the hydraulic hose had been installed backward so that a bend in the fitting connection made contact with the body of the bulldozer, resulting in wear and abrasion of the hose at the connection. This was not discovered during inspection of the machine.
2. The employees doing inspections were not instructed to examine the hoses for signs of wear and abrasion as required by 29 CFR 1926.21(b)(2).

ACCIDENT PREVENTION RECOMMENDATIONS

1. Train maintenance and operating personnel to recognize potential problems with the operation of the machinery.
2. Have competent persons perform periodic inspections of all operating equipment.
3. Ensure that the employer initiates and maintains a safety and health program, in accordance with 29 CFR 1926.20(b)(1).

SOURCES OF HELP

- OSHA Construction Standards [29 CFR Part 1926], which include all OSHA job safety and health rules and regulations covering construction, may be purchased from the Government Printing Office, phone (202) 512-1800, fax (202) 512-2250, order number 869022-00114-1, \$33.
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