



Safety Training Topics

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SAFETY TRAINING TOPIC

Commercial Vehicles

WHAT IS A COMMERCIAL VEHICLE?

A Commercial Motor Vehicle is any self-propelled or towed vehicle used on highways in intrastate or interstate commerce to transport passengers or property:

- If it has a gross vehicle weight rating of 26,001 or more pounds; or
- If it is designed to transport more than 16 passengers, including the driver; or
- If it is used to transport hazardous materials (as defined in 49 U.S.C. App. 1801 et seq.) in quantity requiring placarding under federal regulation.

Simple definition:

In essence, it's usually a big truck that may pull a freight trailer.

However, the company and its insurance agency may consider any company vehicle a commercial vehicle.

THE COMMERCIAL MOTOR VEHICLE SAFETY ACT (CMVSA)

This Act requires all states to meet the same minimum standards for testing and licensing drivers of commercial motor vehicles. The act also mandates uniform penalties and a central reporting system. Violations of the CMVSA are serious.

THE LAWS

The laws surrounding commercial vehicles boil down to one thing: Don't drive a commercial vehicle unless you have a current Commercial Driver's License (CDL) with authorization for that vehicle. Period.

DON'T MOVE THE TRUCK

If a truck is delivering the switchgear you need but is on the wrong side of the building, don't "do the driver a favor" and drive it to the correct side.

If a truck is blocking your way and you can't find the driver, don't hop in the truck and try to move it. Call security and have them find the driver. Do not attempt to open the trailer. The truck may be legit, or it may be part of a terrorist act. Stay clear of it.

TAKING DELIVERY

You may need to be on hand to load or unload electrical equipment, especially if you are on a rush job. In that case, you may be interacting with the driver.

Commercial vehicles are hard to drive, which is one reason for the stringent licensing. Cut the driver some slack.

Offer to help the driver back up, especially if the driver is trying to maneuver a 28-foot trailer into a tight space.

Do not stand directly behind the vehicle. If assisting the driver, stand off to the side and follow directions on where the driver wants you positioned.

Stay clear of the vehicle while it is moving.

The driver may be distracted or tired, so diplomatically double check safety items before loading or unloading. For example, ensure the wheels are blocked. The driver will know how to do this- you can help just by asking if it is done.

Rope off the delivery area if, for example, you need to uncrate panel board enclosures and inspect them before the driver leaves.

The driver is under tight time pressure, and despite the hyperbole to the contrary, these folks cut safety corners to "make time" they lost through delivery delays. So, help make the delivery go as smoothly as possible. For example, if you are taking delivery of a motor, have your insulation resistance tester ready.

Do not raise the trailer door or enter the trailer until the driver tells you it's OK to do so.

Do not operate a lift truck unless you have been formally qualified to use that particular truck. A delay from an accident will take far longer than a delay in finding a qualified operator. If you can't find a qualified operator, contact your foreman.

REVIEW AND DISCUSSION

- What is a commercial vehicle?
- How can you sum up the laws about commercial vehicles?
- When can you *move* a commercial vehicle?
- What should you do if you find a commercial vehicle unoccupied in a main traffic area of a plant or other job site?
- Is it OK to stand on the running board of a commercial vehicle, as long as you hang onto the door?
- If you are assisting the driver in backing into a tight space, where should you stand?
- What should you double-check, before loading or unloading takes place? What are some safety items to run through, in that process?
- When should you stay clear of the commercial vehicle?
- How can you help a driver get through the delivery or pickup in a timely manner, and why is that important?
- If you can't find a qualified lift truck operator, how do you get that new switchgear off the truck so you can get it set in place and go home?

SAFETY TRAINING TOPIC

Traffic Control

WHY THIS IS IMPORTANT TO YOU

Several hundred people die each year in traffic-related deaths in construction zones. The trend is rising because of changing demographics, increasing driver distractions (such as cell phones), and increasing work in traffic areas.

Both above grade and subsurface work on and around roadways will become more common with the replacement of crumbling infrastructure and the need for increased capacity, or with new innovations such as high-tech traffic control systems. You are likely to work on one of these projects, if you have not already done so.

Governments have responded to the increased dangers with "Give 'em a brake" signs, construction zone fine multipliers, and severe penalties for violating certain motorist rules in construction zones. This is a problem that gets attention. Unfortunately, none of the corrective actions have eliminated the dangers.

WHAT YOU NEED TO DO

Understand the general goal of traffic control plans to route traffic through work zones as closely as possible to normal conditions using geometry and traffic control devices while minimizing danger to the working crews.

Understand the traffic control plan for your particular part of the project. Your foreman will communicate this plan to you, so ask questions as needed.

If you think you see a weakness in the plan, identify it to your foreman and ask for clarification or resolution. Not all plans are perfect. An example of a weakness is not allowing for sufficient room in the right place for the boom truck you need.

Understand the restrictions the traffic control plan places on you where you can walk, what kinds of gestures you can make, where you can place tools, and so on.

Wear the proper PPE for the conditions. In some cases, this would mean wearing an orange vest or similar item that makes you stand out against the background.

When entering or exiting a pit or manhole-but especially when exiting-look first for vehicles that have run the barricades or are driving on the shoulder or other areas where traffic is not supposed to be. This happens often enough that it is a concern.

On a large or long-lasting project, you'll typically have traffic control attendants. It is very unlikely an electrician will be directing traffic. However, things happen; people get injured, don't show up, etc., or a particular operation may require extra people to control traffic for a few minutes. You may be asked to help control traffic. In such a case, keep in mind that your goal is to communicate with motorists and with the other traffic controllers if there are any. Make eye contact and use clear hand signals. Allow time for people to respond.

IF YOU ARE A SMALL CREW

On a small or short-lived project, you probably won't have a traffic control attendant. Linemen work under such conditions all the time. In such cases, you must use traffic control devices to alert motorists to drive around your vehicle or work area. These devices would be unattended while you and others do the work.

Park your truck in such a way as to minimize the likelihood of being struck by regular traffic motorists.

Take care to direct traffic with hand signals so you can clear a path to safely set up the traffic control devices. It does no good to get hit by a car while setting these up.

When choosing placement locations for the traffic control devices, allow time for people to respond. Placing one device 10 feet in front of a truck doesn't do much good. Placing a series of devices between the flow of traffic and your truck gives drivers the time they need to change lanes.

To increase your assurance that the traffic control devices will protect you while you are working, pause after placing them. Watch how motorists approach these devices. If the motorists adjust to these devices smoothly, you have placed them well. If the motorists are making sudden stops or appear confused, reassess placement and make the necessary corrections. If this doesn't fix the problem, you may need to contact your foreman about getting a traffic control attendant or possibly rescheduling the work for a safer time.

If you can see your traffic control devices from the work area, look at them or the traffic occasionally to ensure they are still working. Whether you can see them or not, check your traffic control devices with each trip back to the truck. They may have been struck, moved by wind, or in some other way rendered ineffective.

REVIEW AND DISCUSSION

- Why is this topic important?
- What is the general goal of traffic control plans?
- What should you do if you don't understand the traffic control plan for your particular part of a project?
- What should you do if you think you see a weakness in the traffic control plan?
- Do traffic control plans place restrictions on you? What might some of these be?
- What might be appropriate PPE if you are working in a manhole on a city street?
- What should you do when entering or exiting a pit or manhole, and why?
- How should you park your truck if you are working on or near a roadway?
- What are some things to remember about traffic control device placement?
- When should you check your traffic control devices?

SAFETY TRAINING TOPIC

Hardhats

WHEN TO WEAR

Wear your hardhat any time you are on the job site, other than in an office or trailer.

TYPES AND CLASSES

Type I hats reduce impact from a blow to the top of the head.

Type II hats reduce impact from a wider range of blows.

Class C hats provide no electric protection.

Class E hats provide protection from high voltage and are proof-tested to 20,000V.

Class G hats provide protection from low voltage and are proof-tested to 2,200V.

WHAT THE HARDHAT DOES FOR YOU

Your hardhat helps identify you, thus improving security for everyone.

It provides some protection from falling objects, arcs, and objects your head might strike in close quarters. Your hat protects you from impact only if you have not altered the suspension system by placing things (other than a cold weather liner) between the suspension and the shell. Ensure your suspension isn't so loose it wobbles and not so tight it pinches your skin.

It is mechanically protective to the extent you have maintained the shell integrity. This means you cannot drill holes into it or alter the shell in any way. The solvents in paint can weaken the hat. Crystal clear acrylic spray may be acceptable, but get approval from your safety director before use.

It is electrically protective to the extent you have maintained shell integrity plus insulating properties. The more you alter the surface of the hat, the less protection it provides. Ink, pencil marks, paint, and paper create conductive paths on the hat, so keep writing and stickers to a minimum.

It keeps you cool. Measurements taken in hot weather show that the temperature in a properly worn hardhat is often less than the temperature outside. That's due to a combination of airflow, evaporation, and shading.

WHAT YOU SHOULD DO FOR YOUR HARD HAT

Properly adjust the suspension system.

Leave the shell intact. Don't drill holes in it, and don't swath it in stickers or other decorations.

Store it in a clean place out of the path of concentrated sunlight. Your car's rear window is not such a place.

Wash it with warm soapy water, and rinse the soap off thoroughly, when the hat shows signs of dirt accumulation. Wash the sweatbands and cradles, too.

Replace the suspension system if it is worn or damaged. Replace the hat if it has dents, cracks, or signs of wear.

Replace the hat if it's been subjected to an impact. It might not have been damaged, but you don't know for sure.

DON'TS

Don't heat it or bend it, and don't modify the visor.

Don't use the area between your head and the shell as a storage bin.

Don't wear it backwards or sideways. The front brim is designed as eye and face protection.

DEMONSTRATION

Have a volunteer wear the sample hard hat, adjusted properly. Tap the hat with the hammer, but don't use much force. You can get the point across without causing a neck injury! Ask the crew members present if anyone wants to volunteer to do this trick without the hat. Note that the hat, having absorbed the impact, may be damaged and should be replaced.

REVIEW AND DISCUSSION

- When should you wear your hardhat?
- What is the type and class of the hardhat you are wearing? Is it correct for the kind of work you are doing?
- How does a hardhat protect you mechanically?
- How does a hardhat protect you electrically?
- What must you do to ensure the integrity of this electrical protection?
- Can a hardhat increase your hot weather comfort? Why?
- Why is the suspension system important, and what must you do to ensure it works for you?
- How should you store your hardhat?
- When should you replace your hardhat?
- What are some "don'ts" for hardhats?

SAFETY TRAINING TOPIC

Respirator Use and Testing

RESPIRATOR TYPES

Respirators range from simple dust masks to Self-Contained Breathing Apparatus (SCBA) units to units connected via hose to a central air supply.

RESPIRATOR SELECTION

Normally, someone else will select the respirator you need for the job at hand. However, be sure you check that the respirator is adequate for the job.

Respirators are often used in conjunction with confined spaces, so check your confined entry permit for the hazards contained in the area, if appropriate.

Your supervisor can help you determine the correct respirator for the job.

PREPARE YOURSELF

You must be respirator-qualified and clean-shaven to use any respirator other than a dust mask.

If you have clogged sinuses, use a decongestant nasal spray or saline solution to clear them. Taking a systemic (oral) decongestant will leave you in a state of vasodilation-check with your safety director before doing this. Under no circumstances should you take an over-the-counter antihistamine, as these increase drowsiness that can endanger you.

If you are a smoker, abstaining from smoking for several hours or days prior to planned respirator work will increase your respirator endurance dramatically by increasing your lung efficiency and lowering the levels of carbon monoxide in your blood by several orders of magnitude.

PREPARE THE RESPIRATOR

If it's a filtering-type unit, ensure it has the right filter, canister, or cartridge attached.

If SCBA, ensure the tanks have enough pressure for the duration of the job.

If it's hose-connected, help your attendant to check the hoses, or wait while it's done before entering the work area.

Wipe the facemask with an alcohol pad or similar disinfectant prior to use.

Check the respirator fit using the negative pressure method shown in training. If, for example, you are using a canister filter, hold your hands over the canisters and inhale. The filter should collapse around your face and stay collapsed until you exhale. Your procedures may also call for you to perform the positive pressure method. If so, take care not to blow too hard.

Test the vent port to ensure you can exhale through it.

USE THE BUDDY SYSTEM

If you feel fatigued, panic, nausea, or other symptoms of distress coming on, motion to your coworkers that you must leave the area. If there is only one coworker with you, help him or her get to a stopping point and leave together. Report to your foreman immediately.

If you sense fatigue, panic, nausea, or other symptoms of distress in a coworker, motion to the person to leave the area. Note any unusual circumstances in the environment. If someone so motions you, leave the area. Report to your foreman immediately.

If the respirator appears to be failing, leave the area immediately. Report to your support team or your foreman.

RESPIRATOR CARE

Clean your respirator after each use.

Before storing it, remove any cartridges or filters and discard them. Clean your facemask with an alcohol pad or similar disinfectant. After giving it time to dry, store it in a clear poly bag with your name on it.

Store the respirator so that you protect it from damage, contamination, dust, sunlight, moisture, and anything else that might harm it.

REVIEW AND DISCUSSION

- Who usually selects the respirator for a given job, and who should double-check?
- What criteria must you meet to use a respirator other than a dust mask?
- What should you do if you have clogged sinuses?
- If you are a smoker, how can abstaining for a few hours or days before using a respirator help you?
- What should you ensure, if you are using a filtering unit?
- When should you clean the respirator?
- How should you clean the respirator?
- How do you check for respirator fit?
- If you sense fatigue or panic in a coworker or in you, how does the buddy system work?
- What are some tips on caring for your respirator?

SAFETY TRAINING TOPIC

Working Hot

WHY THIS IS IMPORTANT

Every time you work on energized circuits you risk an arc blast or electric shock.

If you take the necessary precautions, you can eliminate the risks.

THE POTENTIAL HARM

Temperatures generated by short-term contact with a circuit even as low as 120V can be 10 times higher than what it takes to cook your tissues.

It takes very little electricity to electrocute you. The amount of current it takes to light a 75W lamp is past the threshold of what it takes to cause fibrillation. When you think of fibrillation, think of your heart being rendered useless.

Electrocution burns take place from the inside out.

Contact time is an important determinant in the severity of damage. The less time, the better. Other factors that determine the severity of damage include voltage, resistance, frequency, and victim characteristics such as age, physical condition, and size, plus some environmental factors.

SHOCK CHARACTERISTICS

At 60 Hz, AC shock produces a tingling sensation that ranges from slight to violent.

DC shock produces a warmth sensation that ranges from warm to burning hot.

When the current through your body reaches a certain point, it paralyzes your arm muscles so you can't let go. This is what people are talking about when they refer to "let-go current."

The let-go current threshold decreases as frequency increases. It takes less current to pass the let-go threshold when you are working on a 400 Hz UPS than when you are working on a 60Hz system.

SHOCK CURRENT PATH

The path the current takes through your body can determine whether you survive or not.

That's why we take measurements with one hand on the probe and one hand in a pocket, rather than with both hands-on probes and a path established across the heart.

That's why we also try to eliminate pathways between feet and hands.

Your heart is on your left side. Thus, if you must choose a path that includes a hand and a foot, choose the right hand and foot rather than the left hand and foot.

PREVENTING ELECTRIC SHOCK

Working on de-energized circuits is an obvious way to prevent shock, but it depends on proper lockout/tagout, proper testing for voltage, and using safety grounds.

Non-compliance with the requirements for ensuring circuits are de-energized is rampant, and the body count from non-compliance is high.

Using the appropriate PPE and following hot work procedures is your first line of defense, not your last.

ELECTRIC ARC BLAST CHARACTERISTICS

The heat from an electric arc can reach temperatures four times as hot as the surface of the sun.

The pressure wave generated by an arc fault can hurl you away from the heat source but usually causes other injuries also. In worst-case scenarios, the pressure wave acts like a giant hammer. The pressure waves are sometimes strong enough to level concrete walls.

PROTECTION FROM FLASH

Wear the required PPE, such as a flash suit, hood, and face shield.

Wear clothing resistant to flash flame wherever exposure to an electric arc flash is possible. In the several seconds, it takes to remove clothing or extinguish flames, you can be subject to deep and possibly fatal burns.

Reduce the likelihood of arc faults, to begin with. For example, make test connections one lead at a time to prevent creating an ionized path that completes a circuit between an energized terminal and the ground. Another way is to remove as many loads from the equipment as possible before working on it.

REVIEW AND DISCUSSION

- Why is it important to know the principles of working hot?
- What are the characteristics of AC shock?
- What are the characteristics of DC shock?
- What is let-go current?
- Regarding hands and feet, what is the proper way to take measurements, and why?
- What is your first line of defense for preventing electric shock?
- How hot can an arc blast get?
- Is the pressure wave from an arc blast powerful? How so?
- What are some clothing and PPE issues, in regard to arc flash and arc blast?
- How can you prevent an arc fault in the first place?