Overhead Hazards Quiz

QUESTION

What are the three major hazards with respect to overhead head crane operations’

ANSWER

- Electrical hazards.
- Overloading.
- Material falling/ slipping from overhead hoists.

WHY IS IT RIGHT

OVERHEAD CRANE SAFETY’THREE MAJOR HAZARDS

The three most common hazards involving overhead cranes include electrical hazards, overloading, and materials falling/slipping from overhead hoists.

Countless companies in the manufacturing and construction industries rely on overhead cranes to lift and transport materials.

When installed and used properly, these systems make operations easier and safer. But, overhead crane accidents cause severe injuries and fatalities every year. Preventing these disasters requires workers to recognize certain hazards that occur during operation and follow safety procedures to avoid them.

There are multiple hazards that can arise regarding cranes in general. Many accidents involve large lift systems like tower cranes and mobile cranes. But hazards do exist with all types of cranes’including overhead cranes’and in all facets of crane operation.

- **ELECTRICAL HAZARDS**

According to OSHA, nearly 50 percent of overhead crane accidents are the result of machinery coming into contact with a power source during operation. Power line contact is literally defined as the inadvertent contact of any metal part of a crane with a high-voltage power line. Power line contact most often occurs when the crane is moving materials nearby or under energized power lines and the hoist line or boom touches one of them. Usually, the person who is electrocuted

is touching the crane when it comes into contact with the power line. But, the danger is not just limited to the operator. It extends to all personnel in the vicinity.

DETERRENTS

Planning

Power line contacts most often occur because safety planning isn't considered and preventative measures haven't been taken to avoid hazards. Planning is one of the biggest accident deterrents available. To start, it's important to establish who is in charge of prejob safety planning before any cranes arrive at a worksite. Furthermore, cranes should be kept away from unsafe working areas; OSHA and ANSI both outline safe distances operators must maintain from a power source when working at a job site. Areas that are considered hazardous are referred to as danger zones, and crane operators should be clearly notified of all potential danger zones. The area within a 10-foot radius of a power line is considered an unsafe work area'or danger zone'and it must be clearly marked on the ground by insulated barriers, fences, tape, etc. This will help create visual clues for workers to ensure that the crane is always positioned so that the boom and hoist line can't intrude in the danger zone.

Overhead Crane operators

OSHA also regulates that overhead crane operators use precautions when working near power lines'even outside of the 10- foot radius. This means, operators should consider all power lines as energized until the electric company tells him or her otherwise. Operators should also maintain a safe speed when operating near power lines. Crane booms or truck-mounted trolleys using an electrical remote control system for loading and unloading can also be very dangerous. If the boom contacts a power line, the operator holding the control box is usually electrocuted instantly. This type of equipment should never be used near power lines. A non-conductive, pneumatic or radio remote control system is a much safer choice when working near power lines.

It's important for operators and workers to receive the appropriate training to avoid danger zones where electrocution can occur. Operators should have workers observing nearby to assist them whenever it is difficult to visually maintain the necessary clearance. Be sure that any ladders, tools, and systems are non-conductive, and ask the electric company to de- energize and ground power lines or install insulation whenever people are working near them.

- **OVERLOADING**

According to OSHA, 80 percent of all crane upsets and structural failures can be attributed to exceeding the crane's operational capacity. When a crane is overloaded, it is subject to structural stresses that may cause irreversible damage. Swinging or sudden dropping of the load, using defective components, hoisting a load beyond capacity, dragging a load and side-loading a boom can all cause overloading.

Overloading most often occurs when poorly trained personnel are allowed to operate cranes. Oftentimes, operators mistakenly believe they are able to rely on their instinct or experience to determine whether a load is too heavy. It's crucial that any crane operator know the weight of a load and the capacity of

the crane. Using technologies such as load-measuring systems for training and planning can greatly reduce the hazard of overloading and operator incompetency.

OSHA requires workers to provide formal training for all crane operators, but operator certification is only required for operators using equipment with a maximum manufacturer-rated capacity greater than 2,000 pounds. Employees who are not qualified are only permitted to operate equipment as operators-in-training with a certified trainer. Formal training should ensure a working knowledge of crane load charts, and on-the-job training is a great preventative measure if the trainer is qualified.

- **MATERIALS FALLING**

Problems

Falling materials is a major concern at any work place or job site using overhead cranes. Visual impairment, two-blocking, slipping, mechanical failure, or operator incompetency can all result in serious injuries or fatalities. If materials are not properly secured, for instance, the load can slip and land on workers in the vicinity or cause major damage to property. For larger or mobile cranes, undesired movement of material can pinch or crush workers involved in the rigging process.

Reduce Risk

- **One way to reduce the risk of falling materials is to perform regular maintenance of hoists.** Load testing maintenance ensures that you know how many pounds the hoist can handle, and it helps to maintain good working condition. Maintenance should always be treated seriously when it comes to heavy machinery. If a moving part on an overhead crane wears out or breaks the hoist, it can cause serious damage. Performing regular maintenance ensures the hoist and overhead crane remain in good working order and that all operations run smoothly.
- **Improper securing of the load or the slings that carry the load is one of the leading causes of accidents with overhead hoists and cranes.** If the load or sling holding the load isn’t properly secured, the objects can slip out, tip, and eventually crash to the ground below. Mechanical failure can also cause machinery to malfunction unexpectedly and drop a heavy load. To reduce the risk, OSHA mandates that operators make daily crane inspections. When mechanical problems do arise, operators should use the lockout/tagout procedure to prevent accidental startup or movement of the crane until the problem has been repaired.
- **Employees working around overhead cranes should always wear proper head, foot, hand, and eye protection.** The crane operator and any workers below should also be aware of his/her surroundings and never walk under a lift. A crane operator must always lower a load to the ground before leaving the lift or during idle times. When moving items, he or she should never raise the load higher than required for clearance.
- **When operating a hoist, properly trained employees in the vicinity should understand that they are working in a dangerous area.** Installing ‘Hoist Danger’ signs around the work area will help to alert employees that a hoist is operating over their heads. Workers should be trained to stay clear of the hoist, and they should never walk beneath loads suspended in the air. Likewise, suspended loads should never be moved over employees and

personnel should never be lifted or transported on a hoist.

- **Careful operation of the hoist is another important safety factor to consider whenever overhead cranes are used.** The person responsible for managing the hoist should be well trained and qualified. Moving the crane too quickly and jerking the hoist when it’s bearing a heavy load can be hazardous to the crane operator and workers nearby. Changing or reversing direction should be done slowly and carefully. Reversing direction can cause heavy loads to spill, and swinging the load is very risky. Operators and controllers must maintain 100 percent focus on the task at hand to avoid potentially dangerous situations.

OVERHEAD CRANE PREVENTION

What to do before moving a load

- Make sure you have the required training, qualifications, or certification as determined by your jurisdiction to operate the crane.
- Make sure the crane is suitable to lift and travel the load.
- Make sure the job site is planned and laid out. Allow room for emergency vehicles to enter if necessary. Do not work near overhead power lines, etc.
- Check ground conditions to ensure stability.
- Visually inspect the crane before use.
- Make sure all loose materials, parts, blocking and packing have been removed from the load before lifting.
- Remove any slack from the sling and hoisting ropes before lifting the load.
- Make sure that the lifting device seats in the saddle of the hook.
- Verify that the load is not heavier than the maximum load capacity.

How to move loads safely

- Move crane controls smoothly. Avoid abrupt, jerky movements of the load.
- Follow signals only from one slinger in charge of the lift, except a stop signal.
- Use agreed upon signals.
- Make sure everyone is away from the load before hoisting. Sound a bell, siren or other warning device and start to hoist slowly.
- Make sure all slings, hooks, hardware, etc. are appropriate for the loading being lifted, are in good working order, and that all angles for the slings are appropriate.
- Make sure nothing links or catches on the load while raising it or travelling.
- Make sure that nothing obstructs the movement of a load.
- Lift the load a small amount to verify that the braking system is functioning properly before proceeding with the lift.
- Keep the load under control when lowering a load. If the braking system stops working, the load can usually be lowered by reversing the hoist controller to the first or second point.
- Set the load on blocking, not the sling itself.
- Do not lower the load below a level that corresponds to less than two full wraps of wire rope left on the drum.
- Stay in a crane cab during power failure. Place controls in “off” position, attract attention and wait for help.

What to do before leaving the crane

- Remove the load hanging on crane hooks.
- Raise all hooks to a mid-position.
- Spot the crane at a designated location.
- Before closing the main switch, make sure that all controllers are in the “off” position.

What to avoid when operating an overhead crane

- Do not carry anything in your hands when going up and down ladders. Items that are too large to go into pockets or belts should be lifted to or lowered from the crane by rope.
- Do not operate a crane if limit switches are out of order, or if cables show defects.
- Do not lower the blocks below the point where less than two full wraps of cable remain on the drum.
- Do not attempt lifts beyond the rated load capacity of a crane or slings.
- Do not lift a load from the side. Centre the crane directly over the load before hoisting to avoid swinging the load.
- Do not allow anyone to ride on a load or hooks.
- Do not leave slings dangling from the load hook. Have sling hooks placed on the sling ring when carrying slings to the load.
- Do not raise loads higher than necessary to clear objects.
- Do not move or pass a load over workers.
- Do not reverse a motor until it has come to a full stop except to avoid accidents.
- Do not walk on the crane runway.
- Do not leave suspended loads unattended.

WHY IS EVERYTHING ELSE WRONG

OBJECTS DROPPED FROM ABOVE

Focus

The focus for all objects at heights should always be on preventing objects from falling rather than a catching object, or on limiting the damage after they fall.

To determine what kind of force an object falling from a certain height generates, calculations can be done around the physics of gravity. For example, an eight-pound wrench dropped 200 feet would hit with a force of 2,833 pounds per square inch ‘ the equivalent of a small car hitting a one-square-inch area.

Most organizations have deployed a fall protection program for workers but have not deployed a drop prevention program for tools and equipment. Expanding a fall protection program to include tools and equipment is far easier for companies and employees than creating a new program for drop prevention.

The difference between a fall protection program for humans and fall protection program for tools is only a matter of perspective: **The first saves you; the second saves others.**

While the most obvious person at risk when objects are dropped is the one underneath, the worker using the tool also can be at risk, as his knee-jerk reaction may be to catch or go after the falling object, which could cause

him/her to lose balance and fall.

People are not designed to work at height. That’s why they wear a fall protection harness. Tools are not designed for use at height either. That’s why we also need to provide a fall protection harness and connection point for tools ‘ so they easily can be tied off.

A harness for a person acts as the primary component of a personal fall protection system. However, for tools, we typically rely on secondary, passive systems, such as debris nets. We rarely deploy a primary system for tools and equipment.

WORK DONE ABOVE OTHERS

Best Scenario

In the **best possible scenario,** work would never take place in situations where someone else is working below. However, the reality is that it can happen on a worksite, whether deliberately or unknowingly.

Simple Approach

Anytime someone is working above someone else, there is the possibility that objects may be dropped. That object may be a tool, something that is being worked on, or even debris. If the object falls on a vehicle or piece of equipment, it may cause significant damage. But if it falls on another worker, serious injury may be the result.

A simple approach is to say that those who are working above others should be careful with how they handle tools and equipment, so they’re less likely to drop anything. However, nobody intends to drop objects. That’s why we refer to those situations as accidents. It’s also why workers should take specific steps to reduce the potential for those accidents, and to limit the possible damage.

1st Step

The first step is to ensure that people who are working below are aware of the work that’s happening above them and are taking adequate precautions. For example, the area beneath the work can be marked off with caution tape, barricades, and signs that alert workers to the potential for falling objects.

If a task that’s being performed overhead will take only a short time, the worker who is performing that task or that worker’s supervisor should personally inform those who will be working below so that they have a heightened sense of awareness.

RECOMMENDATIONS

- Instead of carrying tools and materials up a ladder or in one’s pockets, it’s usually safer to place them in buckets or other containers attached to a lift line or winch. Make sure the items being raised are balanced properly and secured in such a way that they’re not likely to tip over or slip out on the journey.
- While working, make sure that materials and tools are kept away from the edges of scaffolding or other raised surfaces, so they’re less likely to

fall if bumped or dislodged. If prolonged work is being performed on a raised surface, toe boards, screens, or similar protection will reduce the chances of objects being knocked off. Tools or materials that are no longer needed should not be stored on the raised surface.

- Poorly stacked materials such as pallets or boxes can easily tumble down if bumped. Items that are loaded improperly on a lift truck or other equipment can also fall. The best prevention is to follow proper stacking procedures and to avoid stacking beyond safe heights. In addition, anytime there is a potential for falling objects, even from a fairly low height, hardhats are a must.
- Objects can also fall when they slip out of the hands of a worker carrying them, or when someone doesn't realize how heavy the object may be and fails to lift it properly. That type of fall does not involve a great distance, but can easily cause severe injury to feet and toes. The same thing can happen if a worker props a component or piece of equipment against the wall, but doesn't secure it. Another worker bumps into the object, and it falls on his feet. This type of injury underscores the value of safety shoes.

PREVENTION

Dropped Objects Prevention ' Best Practices and Solutions

1. Expand fall protection programs to include tools and equipment.
2. Provide a competent person to manage the expanded program.
3. Raise awareness of drop hazard identification and mitigation techniques within the workforce.
4. Require risk assessments before performing work with drop hazards.
5. Consider regularly scheduled "hazard hunts" to drive awareness of drop hazards.
6. Consider using tethered tools. These tools either have built-in connection points placed by the manufacturer or can be retrofitted with connection points. Next, the tools are connected to a lanyard. This solution not only applies to small hand tools, but also can be used for tools and small pieces of equipment that weigh up to 80 pounds, such as rivet busters, portable generators, etc. Tethered tools mostly are used by larger construction companies and are not in wide use yet. But this may change, as younger workers tend to be more concerned with safety than veterans.
7. Consider using energy-absorbing lanyards, which will reduce the force associated with the dropped tool. Tools either can be connected to a worker through a tool belt, harness or wristband, or anchored to a fixed structure.
8. Tools that weigh more than five pounds should never be tied-off to a person. If a heavy object gets loose, the weight and force could dislocate a wrist or shoulder or even pull a worker over a ledge or scaffolding.
9. If a worker has a tool attached to him and needs to pass it off to a colleague, that colleague can connect to the tool before the passing worker disconnects from it, ensuring the tool is 100 percent tied off and never has the opportunity to become a drop hazard.
10. Employees should be properly trained on how to use tethered tools. They must be taught how to attach a connection point to the tools, use the lanyards properly and respect the weight rating of the lanyards.
11. As a best practice, workers at height should only bring up the tools they need to do their job.

12. Hoist up items and then transfer them over with different lanyards to the workers themselves or to static anchor points. This can be done in a bucket, which can then house the extra tools. But many popular plastic buckets present other safety concerns, as they frequently fall over, spilling their contents.
13. There are many buckets, bags and pouches available on the market with closure systems to dramatically reduce the likelihood of items falling out. Some even close automatically when turned upside down.
14. A secondary solution to dropped objects are toe boards. Toe boards should be capable of withstanding a force of at least 50 pounds in any downward or outward motion.
15. Debris nets are another secondary solution and provides a way to catch dropped objects. Green netting that goes over buildings when they are being refaced in areas where there are a lot of pedestrians is the most recognized form, but there also is netting that is put up within the construction project, such as directly under work being done, to help stop objects from falling on workers below. However, nets can’t be the only solution, as objects often don’t fall straight down or are small enough to go right through the debris netting.