



## ***ABOUT INDUSTRIAL CRANE SAFETY***

**LENGTH: 12 MINUTES**

### **PROGRAM SYNOPSIS:**

Our workplace is full of hazards, hazards that can hurt us or kill us. Controlling these hazards and preventing injuries is the point of our safety and health program. One such hazard is the one presented by the movement of materials by an industrial crane. Ensuring that operators of industrial cranes are fully trained and always operate their crane in a safe manner can prevent injuries and save lives. That is the point of our facility's policies regarding crane operation and that is the point of this program. So, pay close attention as we get to the point about industrial crane safety.

Topics include pre-operational inspection, inspecting various types of lifting devices, proper rigging of the load, preparing to lift a load and lifting and transporting a load safely.

### **PROGRAM OBJECTIVES:**

After watching the program, the participant will be able to explain the following:

- What to look for in a pre-operational inspection;
- How to properly inspect lifting devices such as slings, chains, wire ropes and hooks;
- How to rig a load properly;
- What actions to take when preparing to lift a load;
- How to safely lift and transport a load.

### **PROGRAM OUTLINE**

#### **INTRODUCTION**

- Cranes have the potential to be very dangerous, so it is critical that operators be properly qualified and devote their full attention to avoiding property damage and injuries while operating an industrial crane.
- Our organization has implemented a crane operator training and certification program. Before being allowed to operate any crane at our facility, operators must successfully complete this program and also be authorized by the company to operate any specific crane.
- Once fully trained and authorized, crane operation begins with a pre-operational inspection.

#### **PRE-OPERATIONAL INSPECTION**

- You should perform a pre-operational inspection before first using any crane.
- Begin by testing all controls to make sure the crane functions as intended. Perform these tests with no load.
- While testing the controls, also ensure that the limit switch, which prevents a load from being raised too high, is functioning properly by raising the empty hook to its limit.
- Confirm that the hoist travels properly on the bridge or trolley in both directions and that any travel limit switches are also working properly.
- Also, be sure to test the emergency stop controls.
- Next, inspect the wire rope of the hoist for kinks or other visible defects by slowly raising and lowering the hook.
- Inspect the condition and function of the hook's safety latch.
- The hook itself must also be in good condition. It should not appear to be stretched or twisted.

#### **INSPECTING WEB SLINGS**

- You must also make it a point to inspect all lifting devices prior to lifting. Lifting devices include slings, chains, wire rope, hooks, spreader bars and other components. These items must be in good condition and rated for the load to be lifted.
- The most commonly used lifting devices are web slings made of nylon and polyester. They should be inspected for frayed webbing, cuts, broken stitches and excessive wear.
- Also, check to make sure they have an attached capacity tag that is legible.
- If you discover any damage or defects during your inspection or if the sling is missing its capacity tag, remove it from service and replace it.

#### **INSPECTING WIRE ROPE SLINGS**

- A sling made from wire rope is another commonly used lifting device that also must be inspected before use.
- When inspecting and handling wire rope, make sure to wear heavy leather gloves to protect your hands from cuts and punctures caused by broken wires.

- If you discover a particular strand of rope has more than five broken wires within one lay, one revolution around the core, the sling must be removed from service.
- Also, if 10 or more broken wires are found at random the sling must also be removed from service.
- In addition to broken wires, check for kinks, separated strands, excessive wear or corrosion.
- Wire rope slings must also have a capacity tag. If a wire rope sling is discovered to be without a capacity tag, it must be removed from service until re-tagged by the sling manufacturer or someone else qualified to certify its weight capacity.

### **INSPECTING CHAINS**

- You must also inspect chains before they are used as a lifting device.
- Check each link for signs of excessive wear or evidence of overloading. Overloaded links will bend slightly inward rather than retain their normal oval shape.
- Look for excessive wear where the links connect together or are attached to a hook or connecting device.
- Chains must also have a capacity tag attached.
- If you discover that a chain has been overloaded, has excessive wear or has no capacity tag, it must be removed from service.
- Spreader bars, shackles and other connecting devices must also be inspected for excessive wear or damage.
- All components used for lifting must display a proper capacity rating and be certified load tested. Never use homemade lifting devices or non-approved components on any part of a rig used for lifting.

### **PROPER RIGGING OF THE LOAD**

- After choosing the appropriate lifting device, you must decide which configuration, or hitch, you will use to attach the sling to the load.
- To prevent a sling from being overloaded, you must check the capacity tag on the sling for its rating when configured using the specific hitch you intend to use.
- The capacity tag will list the sling's lifting capacity for the three most common hitches: the vertical hitch, the basket hitch and the choker hitch.
- The vertical hitch is formed by simply attaching the sling directly from the hook to the load.
- The basket hitch is formed by running the sling under the load and attaching both ends to the hook.
- A choker hitch is formed by passing one end of a sling through another and attaching it to the crane hook. When the choker hitch is pulled tight, it help grips the load.
- To better balance a load or reduce the force on any one sling, multiple slings are often used. When this is the case, the amount of force placed on any one sling depends on the sling angle that is created.
- The angle formed between a sling leg and a horizontal line drawn at the top of the load is referred to as the "horizontal sling angle."
- The amount of force placed on a sling increases greatly as this horizontal sling angle gets smaller. In fact, a sling can easily become overloaded and break if rigged with too small of a horizontal sling angle.
- A good rule of thumb is to select a sling rated for the full weight of the load and rig it with a horizontal sling angle of at least 60 degrees or more.
- When attaching the load to the hook, make sure the sling or connecting device is placed in the throat, or deepest portion, of the hook. This is the only part of the hook that will hold loads safely at its rated capacity.

### **PREPARING TO LIFT THE LOAD**

- Before using the crane to lift a load, you must make sure that the travel path is free of hazards and that all nearby co-workers are made aware that you will be moving the crane and load.
- Inform everyone close by that you are preparing to operate the crane and make sure all workers are clear from the immediate area before starting your lift.
- Make sure there are no obstructions in the planned path of travel and make it a point to check for overhead hazards or other cranes that could impede the route to your destination.
- When first lifting the load, you must test that the load is properly balanced and also test that the crane's brakes are functioning properly.
- Begin by placing the crane directly over the load and lift it a few inches to make sure it is properly balanced and doesn't swing.
- If the load swings or appears unbalanced, lower it back to the floor and adjust the rigging.
- Once you have the load balanced properly, leave it suspended a few inches off the floor, for about 30 seconds, to ensure the brakes are holding and functioning properly.

### **LIFTING & TRANSPORTING THE LOAD**

- Now you are ready to lift and transport the load. If the lift is being made in tight quarters or your visibility is limited by obstructions, you may need a co-worker's assistance to move the load safely.
- This type of assisting co-worker is called a "signaler." The signaler must be trained in the use of standardized hand signals which are used to help the operator guide the load safely to its destination.
- Before the lift begins, the operator and signaler should discuss these signals as well as any other methods they will use to communicate during the lift.
- Often, the operator will need the assistance of one or more co-workers to man a tagline that helps control the load during a move. Tension is maintained on the tagline to prevent the load from swinging out of position and to help guide the load into the desired orientation for placement.
- The crane should be directly over a load when lifting it. If a load is from an angle instead of from the vertical, the load can swing out of control, causing property damage or injury.
- Always lift the load slowly and smoothly. Avoid abrupt stops and sudden jerks.
- When the load is moving, it should be elevated just high enough to safely clear obstructions in your path.

- It should also be traveling at a rate of speed that allows you to take corrective action if a hazard develops.
- Position yourself so that you may observe the location of the load and its travel path concurrently.
- Never allow co-workers to pass underneath loads and never pass loads over them.
- Of course, allowing anyone to ride a load is strictly prohibited.
- When the load arrives at its destination, land it as soon as possible. Never leave a suspended load unattended.
- After the load has been landed and secured, remove all lifting devices and return them and the crane to their proper storage area.