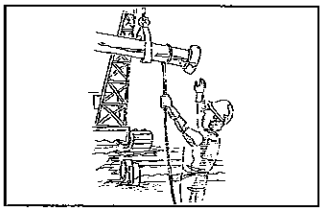


Cranes & Derricks—An Overview

Overview Of Topic

General requirements for the operation, maintenance, and inspection of cranes, derricks, and equipment are in the construction standard at §1926.550-Cranes and derricks.

The first requirement is that you must comply with applicable manufacturer's specifications and limitations.

Crane and crane equipment modification

Modifications of or additions to equipment which affect the capacity or safe operation, are strictly forbidden by OSHA without notifying the manufacturer and obtaining written approval. In no case may the original safety factor of the equipment be reduced.

Competent person

A lot of responsibility is placed on the "competent person" at your site for the inspection and safe operation of cranes.

Competent persons must: (1) inspect all cranes and crane equipment prior to and during use to make sure they are in a safe operating condition, and (2) perform a thorough annual inspection of hoisting machinery.

Inspection requirements

Cranes and associated rigging equipment must be inspected regularly to identify any existing or potentially unsafe conditions.

A thorough inspection program can forecast maintenance needs or potential equipment failures or malfunctions. The lack of such a program could result in serious deterioration of the equipment.

OSHA requires that inspections be divided into two categories: **frequent** and **periodic**.

Frequent inspections are usually performed at the start of each shift by the "competent person" who walks around the crane looking for defects or problem areas. Components having a direct bearing on crane safety, and whose status can change from day-to-day, must be inspected, and when possible, observed during operation for any defects that could affect safe operation.

Frequent inspections should include, but are not limited to the following pre-operation inspections: site activity, daily walk around, pre-start-up (in cab), and crane operation.

Periodic inspections include a monthly and an annual inspection.

Suspended personnel platforms (Personnel hoists)

Using cranes to hoist workers poses a significant risk even if certain precautions are followed. To help prevent employee injury or death, OSHA has issued standards to limit the use of personnel hoisting and prescribe proper safety measures for these types of operations.

Employee Training

Crane operators: Must know manufacturers specifications and limitations applicable to the operation of their crane and attachments, or any limitations determined by a qualified engineer.

Competent persons: Must know inspection procedures for all machinery and equipment and be able to conduct an annual inspection if required by employer.

OSHA state-plan-states: Remember that certain states have more stringent regulations that go above and beyond the OSHA standards.

Training Tips

Actual inspection checklists should be used as a supplement for training. In actuality, preparing to use a crane is somewhat like preflighting and flying an aircraft. Checklists make the training and performance of inspections easier.

Where To Go For More Information

29 CFR 1926.550—Cranes and derricks.

ASME B.30.5-2000—Mobile and Locomotive Cranes.

ASME B30.2—Overhead and Gantry Cranes.

KELLER'S CONSTRUCTION TOOLBOX TALKS

Cranes and Derricks

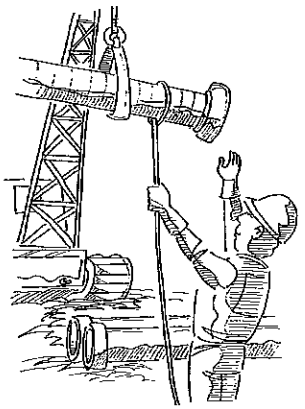
Whether you are a crane operator, spotter, or working in the vicinity of crane operations, you must be ever aware of what is going on and know where everyone is as you go about your work.

Another critical aspect of crane operations is inspection. Use the following checklists, developed from OSHA regulations, for crane inspection and operation.

Pre-Operational (Daily) Walk Around Inspection

Inspect all cranes and crane equipment at the start of each shift and during use to ensure it is safe to operate. Deficiencies must be repaired, or defective parts replaced, before the equipment can be used. This inspection is the responsibility of the company competent person.

Pre-Start-Up (In Cab) Inspection



The OSHA inspection requirements for each of the following areas must be met before you, the operator, starts up the equipment: cab, fire extinguisher, field of vision, placards, load rating chart.

Check the following equipment for proper operation before using: outriggers when used; brakes and clutches for adjustment and operation; boom hoist lockout and other operator aids such as anti-two-block devices and load moment indicators.

After start-up, check all gauges and warning lights for proper readings; operate all controls to ensure they are functioning properly.

Crane Operation Checklist

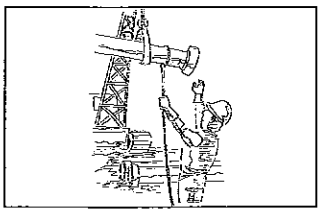
Only qualified and properly designated people may operate the crane. All personnel must be kept clear of loads about to be lifted and suspended loads. Between the crane operator and ground personnel the following areas must be constantly checked and rechecked.

Overhead power lines—ensure all electrical distribution and transmission lines are deenergized and visibly grounded or, erect insulating barriers to prevent physical contact with the lines. If it is not possible to meet either of the two methods above, cranes may operate close to power lines only if clearances in the charts in the OSHA regulations are met.

Hand Signals—The signal man and the crane operator must be familiar with the hand signals required for the crane type you are operating. A chart, illustrating the hand signals, must be posted at the job site.

Barricades—Barricades must be set up to protect employees from being struck or crushed by the rotating superstructure of the crane.

Passengers—No one except the oiler, instructor, or competent person is allowed on the crane when it is in operation. The operator shall not hoist, lower, swing, or travel while anyone is on the load or hook. This includes riding a bare hook or a load of material such as beams, girders, or concrete buckets.



Cranes & Derricks — An Overview Sign-Off Sheet

This sign-off sheet documents the employees who have taken part in a training session on Cranes and Hoists — An Overview at _____.
(company name)

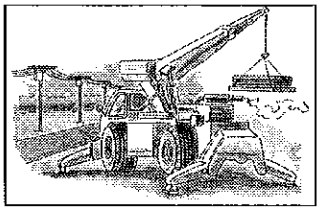
The session covered the following:

- The importance of manufacturer's instructions and specifications.
- The duties and responsibilities of the competent person.
- Inspection requirements.

The space below is for each individual who has been trained on this topic to sign his/her names.

Date of Training: **Job Location:**

Employee Signature	**Print Name Here**



Cranes & Derricks—Crane Load Charts

Overview Of Topic

Cranes are very necessary equipment on many jobsites. It takes a lot of training to be able to safely operate a crane. An important part of the training should cover the safe lifting capacity. Manufacturer's operating notes (supplied with the machine) contain important information concerning proper set-up, operation, and additional points that need to be considered when calculating the load handling capacities of cranes. Mistakes in calculating capacity can cause serious accidents and death.

Requirements

The first requirement is that the employer must comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks.

Factors to be considered when calculating the crane load capacity include the following:

- **Load Radius:** the horizontal distance between the center of the crane rotation to center of the load.
- **Boom length:** including the jib, swing away extension or any other attachments that may increase length of the boom.
- **Parts of line:** refers to the number hoist rope lines that are reeved (installed) between the boom sheave wheels and the lift hookblock. If you were to look at a crane and see four rope lines coming down from the boom nose to the hookblock, that would be considered four "parts of line."
- **Quadrant of operation:** the area of operation that the lift is being made in. Different quadrants usually have lower lifting capacities.
- **Boom angle:** the angle formed between the horizontal plane of rotation and center line of the boom.
- **Weight of any attachments:** jib, lattice extension or auxiliary boom point.
- **Weight of handling devices:** ball, block, and/or any necessary rigging.

Many cranes come with load capacity charts which are supplied as a convenience to assist in job planning. You should not rely on these charts to make final lift decisions. There are too many factors that affect load capacity including wind, terrain, and the type of load being lifted.

Crane attachments or modifications

All attachments used with cranes must not exceed the capacity, rating, or scope recommended by the manufacturer.

Modifications of, or additions to your equipment, which affect the capacity or safe operation, are strictly forbidden by OSHA without notifying the manufacturer and obtaining written approval. Unauthorized modifications can cause accidents and fatalities.

If modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, must be changed accordingly.

Do not reduce the original safety factor of the equipment.

Employee Training

Crane operators must know manufacture's specifications and limitations applicable to the operation of their crane and attachments, or any limitations determined by a qualified engineer.

Competent persons must know inspection procedures for all machinery and equipment, and be able to conduct an annual inspection if required by the employer.

Training Tips

Bring in a crane load chart to show trainees. Discuss some of the types of cranes your employees may encounter at your jobsites.

Where To Go For More Information

29 CFR 1926.550—Cranes and derricks.

ASME B30.5-2000—Mobile and Locomotive Cranes.

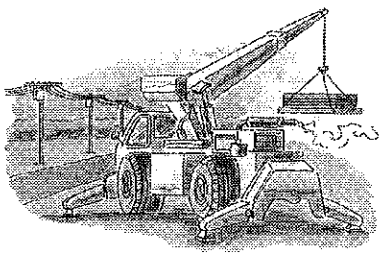
KELLER'S CONSTRUCTION TOOLBOX TALKS

Crane & Derricks—Crane Load Charts

Cranes are very necessary equipment on many jobsites. It takes a lot of training to be able to safely operate a crane. An important part of the training covers safe lifting capacity. Manufacturer's operating notes supplied with the machine contain important information concerning proper set-up, operation, and additional points that need to be considered when calculating load handling capacities of cranes. Mistakes in calculating capacity can cause serious accidents and death.

Safety factors

Factors to be considered when calculating the crane load capacity include the following:



Load Radius: the horizontal distance between the center of the crane rotation to center of the load.

Boom length: including the jib, swing away extension or any other attachments that may increase length of the boom.

Parts of line: refers to the number of hoist rope lines that are reeved (installed) between the boom sheave wheels and the lift hookblock. If you were to look at a crane and see four rope lines coming down from the boom nose to the hookblock, that would be considered four "parts of line."

Quadrant of operation: the area of operation that the lift is being made in. Different quadrants usually have lower lifting capacities.

Boom angle: the angle formed between the horizontal plane of rotation and center line of the boom.

Weight of any attachments: jib, lattice extension or auxiliary boom point.

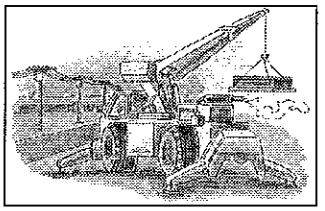
Weight of handling devices: ball, block, and/or any necessary rigging. Many cranes are supplied with load charts as a convenience to assist in job planning. You should not rely on these charts to make final lift decisions. There are too many factors that affect load capacity including wind, terrain, and the type of load being lifted.

Crane attachments or modifications

Comply with the following:

- All attachments used with cranes must not exceed the capacity, rating, or scope recommended by the manufacturer.
- Modifications of, or additions to, your equipment, which affect the crane capacity or safe operation, are strictly forbidden by OSHA. Notify the manufacturer and obtaining written approval before making any changes. Unauthorized modifications can cause accidents and fatalities.
- If modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, must be changed accordingly.
- Do not reduce the original safety factor of the equipment.

If you have any questions on how to use crane load charts, see your supervisor.



Cranes & Derricks—Crane Load Charts Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Crane & Derricks—Crane Load Charts. The session covered:

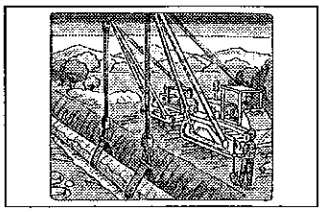
- The safety factors to be considered when calculating crane load capacity.
- Requirements for crane attachments.
- Requirements for crane modifications.

The space below is for employees to "sign-off" that they were in attendance.

Date of Training: _____ **Job Location:** _____

Employee Signature	Print Name Here

_____
Supervisor's Signature



Cranes & Derricks—Crane Operations

Overview Of Topic

Cranes are very necessary equipment on many jobsites. They are designed, tested, and manufactured for safe operations. When used properly, cranes can provide safe reliable service to lift or move loads. Cranes have the potential for causing catastrophic accidents if safe operating practices are not followed.

Job Planning

Accidents can be avoided by careful job planning. The first requirement is that the employer must comply with the manufacturer's specifications, and limitations, applicable to the operation of any and all cranes and derricks.

Operational Considerations

Comply with the following operational considerations:

- Use the load capacity chart that came with the crane.
- When working at boom lengths or radii between the figures shown on the load capacity chart, the next lower capacity rating should be used. It is dangerous to guess the capacity for boom lengths or radii between those listed on the rating plate.
- It is very dangerous to lift a load without knowing whether it is within the rated capacity. Don't expect the crane to slowly tip over, warning the operator of an overload. Cranes may suddenly tip over, or the boom may collapse, if the load is too heavy.
- Operators must reduce the load capacity under adverse field conditions until it is determined the machine can safely handle the lift.
- Do not use counterweights heavier than the manufacturer's recommended weight.
- Even a light wind can blow the load out of control, collapse booms, or tip machines.
- Winds aloft can be much stronger than at ground level.
- Proper precautions must be taken when the velocity of wind exceeds 20 mph.

- Crane capacity can be adversely effected when the machine is not level.
- Do not lift loads when winds create an unsafe or hazardous condition. Booms should be lowered, if possible, under high wind conditions.
- Foot pedal brake locks are furnished on some cranes to allow the operator to rest his legs (for short periods of time) when suspending the load. Operators should keep their feet on the pedals while foot pedal brake locks are in use. Brakes may cool allowing the load to fall.
- No one, except the oiler, instructor, or designated person should be allowed on a crane with the operator when the crane is in operation.

Employee Training

Crane operators must know manufacture's specifications and limitations applicable to the operation of their crane and attachments, or any limitations determined by a qualified engineer.

Competent persons must know inspection procedures for all machinery and equipment, and be able to conduct an annual inspection if required by the employer.

Training Tips

Bring in a crane load chart to show trainees. Discuss your jobsite specific crane operations.

Where To Go For More Information

29 CFR 1926.550—Cranes and derricks.

ASME B30.5-2000—Mobile and Locomotive Cranes.

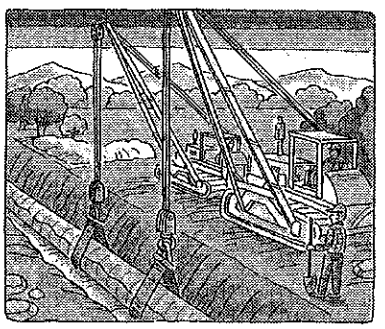
KELLER'S CONSTRUCTION TOOLBOX TALKS

Cranes & Derricks—Crane Operations

Cranes are very necessary equipment on many jobsites. They are designed, tested, and manufactured for safe operations. When used properly they can provide safe reliable service to lift or move loads. However, cranes have the potential for causing catastrophic accidents if safe operating practices are not followed.

Job Planning

Accidents can be avoided by careful job planning. The first requirement is that your employer must comply with the crane manufacturer's specifications and limitations that apply to the operation of the crane.

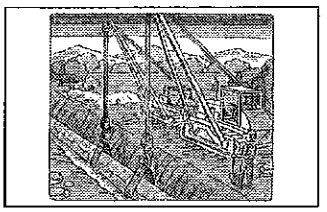


Operational Considerations

You and your employer should remember and follow these operational considerations:

- Use the load capacity chart that came with the crane.
- When working at boom lengths or radii between the figures shown on the load capacity chart, the next lower capacity rating should be used. It is dangerous to guess the capacity for boom lengths or radii between those listed on the rating plate.
- It is very dangerous to lift a load without knowing whether it is within the rated capacity. Don't expect the crane to slowly start to tip over. Cranes may suddenly tip over, or the boom may collapse, if the load is too heavy.
- Always stay within the rated capacity. Reduce the load capacity under adverse field conditions until it is determined the machine can safely handle the lift.
- Do not use counterweights heavier than the manufacturer's recommended weight.
- Even a light wind can blow the load out of control, collapse booms, or tip machines.
- Winds aloft can be much stronger than at ground level.
- Proper precautions must be taken when the velocity of wind exceeds 20 mph.
- Crane capacity can be adversely affected when the machine is not level.
- Do not lift loads when winds create an unsafe or hazardous condition. Lower booms under high wind conditions.
- Foot pedal brake locks are furnished on some cranes to allow the operator to rest his legs (for short periods of time) when suspending the load. Operators should keep their feet on the pedals while foot pedal brake locks are in use. Brakes may cool allowing the load to fall.
- No one, except the oiler, instructor, or designated person should be allowed on a crane with the operator when the crane is in operation.

If you have any questions about the safe operation of cranes at your jobsite, make sure you ask your supervisor.



Cranes & Derricks—Crane Operations Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Cranes & Derricks—Crane Operations. The session covered:

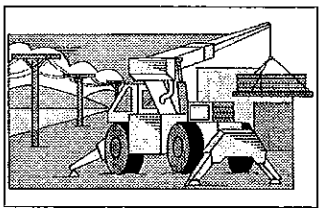
- The importance of proper job planning.
- Operational considerations and how they work with job planning to provide a safe jobsite.

The space below is for employees to "sign-off" that they were in attendance.

Date of Training: _____ **Job Location:** _____

Employee Signature	Print Name Here

_____
Supervisor's Signature



Cranes & Derricks—Crane Safety Depends on Four Factors

Overview Of Topic

Crane safety depends on four factors:

- Design and specifications of the crane.
- Operating environment.
- Crane operator's control and training.
- Maintenance of the crane.

Crane design and specifications

Always follow the manufactures' instructions for the safe operation of the crane. Know the limits of the crane you are using. If you have a crane that is older and does not have a maintenance manual, or operators manual, you have to consult an engineer to help you determine the crane's limits.

Operating environment

You can control the operating environment. Go to the site before hand and do a site inspection. Look for hazards that your employees could be exposed to. Be aware of hazards that develop during the course of the job.

Operator's control

The crane operator is also a factor because of the chance for operator error. This can result from inexperience, pressure to complete the job, and not following company rules.

To help the operator, post the following information on all cranes:

- Rated load capacities in the form of a load chart. (A substantial and durable rating chart with clearly legible letters and figures shall be provided with each crane and securely fixed to the crane cab in a location easily visible to the operator while seated at his control station.)
- Recommended operating speeds.
- Special hazard warnings (e.g., high voltage warnings).
- Instructions (e.g., company specific information).

Operator's training

The employer must only allow those employees qualified by training or experience to operate the crane. Usually the employer designates the employees who are allowed to operate the crane. Everyone else must stay out of the crane cab.

Crane maintenance

Many crane accidents occur not because of operator error, but because of improper crane maintenance. Make sure your equipment maintenance workers follow the manual that came with your crane. If you have a crane that is older and it does not have a maintenance manual or operators manual, contact the crane manufacturer.

Follow 29 CFR 1926.20(b)(3) which says, "The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of this part is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation."

Employee Training

29 CFR 1926.20(b)(4) says, "The employer shall permit only those employees qualified by training or experience to operate equipment and machinery."

Training Tips

Talk about the various types of cranes that your company uses. If possible, tour the site indicating where cranes have been used and where they will be used in the future. Discuss any company specific crane rules.

Where To Go For More Information

29 CFR 1926.20—General Safety and Health Provisions.

29 CFR 1926.550—Cranes and derricks.

KELLER'S CONSTRUCTION TOOLBOX TALKS

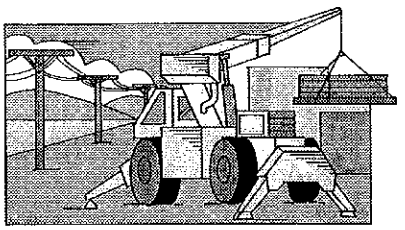
Cranes & Derricks—Crane Safety Depends on Four Factors

When crane accidents occur there is usually loss of life and extensive properly damage. To prevent these incidents from happening it's important to understand the four main factors that influence the safe operation of your crane.

Safety times four

Crane safety depends on four factors:

- Design and specifications of the crane.
- Operating environment.
- Crane operator's control and training.
- Maintenance of the crane.



Crane design and specifications

Always follow the manufactures' instructions for the safe operation of the crane and know the limits of the crane you are using. If you have a crane that is older and does not have a maintenance manual, or operators manual, your employer must consult an engineer to help determine the crane's limits.

Operating environment

As an operator, you can control the crane operating environment. Your employer should go to the site before hand and do a site inspection, looking for hazards that you and other employees could be exposed to. Also, be aware of hazards that develop during the course of the job.

Operator's control and training

The crane operator is also key to crane safety because of the chance of operator error. This can result from inexperience, pressure to complete the job, and not following company rules. To help the operator, your employer should post the following information on all cranes:

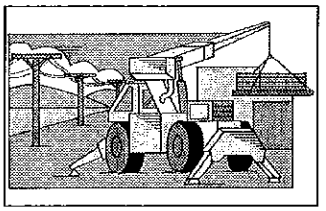
- Rated load capacities in the form of a load chart.
- Recommended operating speeds.
- Special hazard warnings (e.g., high voltage warnings).
- Instructions (e.g., company specific information).

Operator's training

Your employer must only allow employees qualified by training or experience to operate the crane.

Crane maintenance

Many crane accidents occur not because of operator error but because of improper crane maintenance. Make sure your equipment maintenance workers follow the manual that came with your crane. If you have a crane that is older, and does not have a maintenance manual, or operators manual, your employer must contact the crane manufacturer.



Cranes & Derricks—Crane Safety Depends on Four Factors Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Cranes & Derricks—Crane Safety Depends on Four Factors. The session covered:

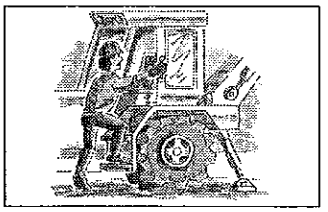
- Crane design and specifications.
- Operating environment.
- Operator's control and training.
- Crane maintenance.

The space below is for employees to "sign-off" that they were in attendance

Date of Training: _____ **Job Location:** _____

Employee Signature	Print Name Here

Supervisor's Signature



Cranes & Derricks—Daily Inspection

Overview Of Topic

Inspection of all cranes and crane equipment should be made at the start of each shift to make sure the equipment is safe to operate. This inspection is the responsibility of the company competent person.

Some of the items that could be checked during the daily inspection include, but are not limited to, the following:

- Check that all exposed moving parts are guarded or isolated. A removed guard may indicate that a mechanic is still working on part of the crane.
- Check the high voltage warning signs are displayed in the exterior of the crane on each side and on the counterweight of the crane.
- Visually inspect each component of the crane used in lifting, swinging, or lowering the load or boom for any defects that might result in unsafe operation.
- Inspect all wire rope (including standing rope). Wire rope must be taken out of service when certain conditions exist (see 29 CFR 1926.552(b)(17)(iv)).
- Check for freedom of rotation of all swivels.
- Inspect tires for cuts, tears, breaks, and proper inflation.
- Check exhaust pipes for guards of insulation in areas where contact by employees (in the performance of normal duties) is possible.
- Visually inspect the crane for fluid leaks in lines, tanks, valves, pumps, and other parts of fuel, air, or hydraulic systems.
- Visually check that the crane is properly lubricated. The fuel, lubricating oil, coolant, and hydraulic oil reservoirs should be filled to proper levels.
- Inspect sheaves, drums, rigging, hardware, and attachments.
- Check all other functional operating mechanisms such as locking mechanisms, limit switches, safety devices, hydraulic cylinders, instruments, and lights.

- Check guardrails, handholds, and steps for security.
- Check platform and walkway anti-skid surfaces for damage or slippery substances.
- Visually inspect the boom and jib for straightness and any evidence of physical damage.
- Look for corrosion under any attachments that are connected to the chords and lacing.
- Look for cracking or flaking of paint.
- On lattice booms, look for bent lacing.
- Check outriggers to make sure that neither the beams or cylinders are distorted or cracked.
- Check that the welds are not cracked and that both the beams and cylinders extend and retract smoothly and hold the load.
- Check the condition of the floats and make sure they are securely attached.

Employee Training

A competent person is required to perform the daily crane inspection. A competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. It takes training to be a competent person.

Training Tips

You may want to prepare a inspection checklist for the requirements that specifically apply to your equipment. Introduce and cover these checklists at this toolbox talk.

Where To Go For More Information

29 CFR 1926.550—Cranes and derricks.

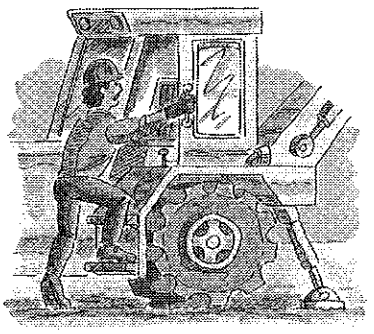
ASME B30.5-2000—Mobile and Locomotive Cranes.

KELLER'S CONSTRUCTION TOOLBOX TALKS

Cranes & Derricks—Daily Inspection

Inspect all cranes and crane equipment at the start of each shift to make sure it is in a safe operating condition. This inspection is the responsibility of the company competent person. Some of the items that could be checked during the daily inspection include, but are not limited to, the following:

- Check that all exposed moving parts are guarded or isolated.
- Check the high voltage warning signs are displayed in the exterior of the crane on each side and on the counterweight of the crane.
- Visually inspect each component of the crane used in lifting, swinging, or lowering the load or boom for any defects that might result in unsafe operation.



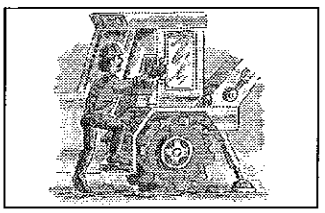
- Inspect all wire rope, including standing ropes.
- Check for freedom of rotation of all swivels.
- Inspect tires for cuts, tears, breaks, and proper inflation.
- Check exhaust pipes for guards of insulation in areas where contact by employees (in the performance of normal duties) is possible.
- Visually inspect the crane for fluid leaks in lines, tanks, valves, pumps, and other parts of fuel, air, or hydraulic systems.
- Visually check that the crane is properly lubricated.
- Inspect sheaves, drums, rigging, hardware, and attachments.
- Check all other functional operating mechanisms such as locking mechanisms, limit switches, safety devices, hydraulic cylinders, instruments, and lights.
- Check guardrails, handholds, and steps for security.
- Check platform and walkway anti-skid surfaces for damage or slippery substances.

Boom and Jib

- Visually inspect the boom and jib for straightness and any evidence of physical damage. On lattice booms, look for bent lacing.
- Look for corrosion under any attachments that are connected to the chords and lacing.
- Look for cracking or flaking of paint. This may indicate fatigue of the metal.

Outriggers

- Check outriggers to make sure that neither the beams or cylinders are distorted or cracked.
- Check that the welds are not cracked and that both the beams and cylinders extend and retract smoothly and hold the load.
- Check the condition of the floats and make sure they are securely attached.



Cranes & Derricks—Daily Inspection Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Cranes & Derricks—Daily Inspection.

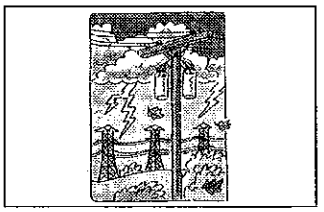
The session covered:

- The role of the competent person.
- Typical items to check during the inspection.

The space below is for employees to "sign-off" that they were in attendance.

Date of Training: _____ **Job Location:** _____

Employee Signature	Print Name Here
Supervisor's Signature	



Cranes & Derricks—Jobsite Hazard Inspection

Overview Of Topic

For the protection of employees working at a crane operation site, employers should perform a pre-operational site inspection. The purpose of the inspection is to look for hazards (and potential hazards) that crane operators and riggers could be exposed to. Some of the areas to be concerned with are:

- Overhead power lines.
- Unstable soil.
- High wind conditions.
- Other work activities in the area.

Overhead power lines

Working around overhead power lines can be very dangerous. Avoid operating equipment within 10 feet of electrical distribution or transmission lines rated 50kV or less, unless:

- Lines have been deenergized and visually grounded; or
- Insulating barriers (which are not part of, or attached to, the equipment) are provided.

You must designate a spotter to observe line clearance of the equipment and give timely warning for all operations where it is difficult for operators to maintain the desired clearance by visual means. For more information refer to 29 CFR 1926.550(a)(15) for details and further line clearance requirements.

Unstable soil

Unstable soil conditions create hazards for crane operators. Cranes can overturn, injuring the operator and other employees working nearby. The load can shift and drop on riggers. Expensive equipment (not counting the crane) can be damaged or destroyed. At the least, the crane could be stuck in the mud.

Have a competent person inspect the jobsite before you deliver the crane.

High wind conditions

It can be difficult to predict the wind conditions that could occur at a jobsite, but there are certain thinks to look for. Is the terrain flat? Wind speed can increase over flat land areas. Are there a lot of high-rise buildings? Wind can be funnelled down streets by tall structures. Keep an eye on the weather and predicted weather conditions. Knowing the seasonal wind direction and speed can prevent accidents.

Other work activities in the area

What about other construction trades working at the worksite? Your crane can take up a lot of space. Make sure you discuss your needs for enough crane swing radius room. You'll need to barricade the area to prevent injury to workers and pedestrians in the vicinity. Make sure your riggers have plenty of room to do their job safely.

Employee Training

While there are no specific training requirements for training workers on pre-site hazard inspection, 29 CFR 1926.21(b)(2) says, "The employer shall 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 or other exposure to illness or injury."

Training Tips

Bring a layout or a diagram of the jobsite and explain where the hazards or potential hazards are located. Discuss any past problems your crane operators have had while operating a crane.

Where To Go For More Information

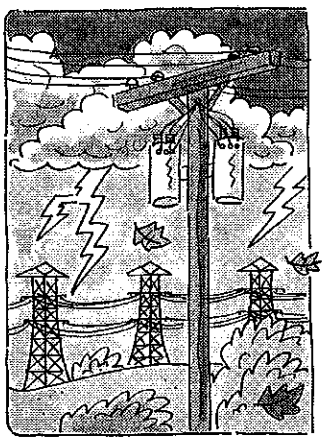
29 CFR 1926.21(b)(2)—Employer responsibility.

29 CFR 1926.550(a)—General requirements.

KELLER'S CONSTRUCTION TOOLBOX TALKS

Cranes & Derricks—Jobsite Hazard Inspection

For the protection of employees working at a crane operation site, employers should perform a pre-operational site inspection. The purpose of the inspection is to look for hazards (and potential hazards) that crane operators and riggers could be exposed to. Some of the areas to be concerned with are:



- Overhead power lines.
- Unstable soil.
- High wind conditions.
- Other work activities in the area.

Overhead power lines

Working around overhead power lines can be very dangerous. Avoid operating equipment within 10 feet of electrical distribution or transmission lines rated 50kV or less, unless:

- Lines have been deenergized and visually grounded; or
- Insulating barriers (which are not part of, or attached to, the equipment) are provided.

Your employer must designate a spotter to observe line clearance of the equipment and give timely warning for all operations where it is difficult for operators to maintain the desired clearance by visual means. For more information refer to 29 CFR 1926.550(a)(15) for additional line clearance requirements.

Unstable soil

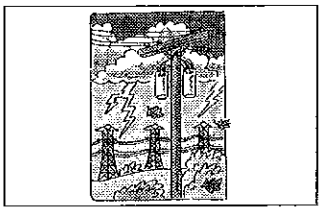
Unstable soil conditions create hazards for crane operators. Cranes can overturn, injuring the operator and other employees working nearby. The load can shift and drop on riggers. Expensive equipment (not counting the crane) can be damaged or destroyed. At the least the crane could be stuck in the mud. Have a competent person inspect the jobsite before the crane is delivered.

High wind conditions

It can be difficult to predict the wind conditions that could occur at a jobsite, but there are certain thinks to look for. Is the terrain flat? Wind speed can increase over flat land areas. Are there a lot of high rise buildings? Wind can be funnelled down streets by tall structures. Keep an eye on the weather and predicted weather conditions. Knowing the seasonal wind direction and speed can prevent accidents.

Other work activities in the area

What about other construction trades working at the worksite? Your crane can take up a lot of space. Your employer should discuss the needs for enough crane swing radius room. You may need to barricade the swing radius area to prevent injury to workers and pedestrian in the vicinity. Also, make sure that the riggers have plenty of room to do their job safely.



Cranes & Derricks—Jobsite Hazard Inspection—Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Cranes & Derricks—Jobsite Hazard Inspection. The session covered:

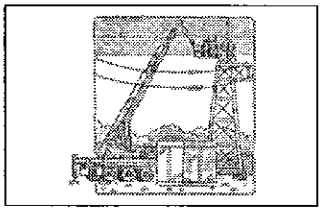
- Why working around overhead power lines can be very dangerous.
- How unstable soil conditions create hazards for crane operators.
- How high wind conditions can pose hazards for crane operators.
- Why other work activities need to be considered in order for the crane to be operated safely.

The space below is for employees to "sign-off" that they were in attendance.

Date of Training: _____ **Job Location:** _____

Employee Signature	Print Name Here

Supervisor's Signature



Cranes & Derricks—Operating Cranes Near Communication Towers

Overview Of Topic

You should be aware of a phenomenon that can occur when operating a crane near communication or broadcast towers. Induction of energy from the nearby antennas can cause electric shock in your employees working on and around the crane (the crane is acting as a conductor for the frequencies coming from the antennas). This type of event can happen if the towers are operating in the 30 to 100 megahertz frequency range.

Even though this is a rare occurrence, it does happen, and you and your employees need to be aware of it.

What exactly is induction?

Induction (as it relates to this phenomenon) is a process that occurs when an electrical conductor becomes electrified when near a charged body. In this case, the communication or broadcast towers are the charged body and the crane is the electrical conductor.

What does OSHA say?

Even though this type of occurrence doesn't happen that often, it has happened enough that OSHA has developed a standard to protect workers. 29 CFR 1926.550(a)(15)(vii) states:

> Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages:
>
> - The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and
> - Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

100 milliampere of induced current

OSHA has adopted, as the maximum exposure, a limit of 100 milliamperes of induced current in working environments. (200 milliamperes of current can cause heart palpitations in people.) Add to this the fact that damp environments or high humidity levels can make workers a better conductor and there is the potential that the electrical charge in the crane can kill or severely injure employees.

What can you do to protect your employees?

If your employees are operating a crane (or working around one) near a source of high power electromagnetic energy fields, it's a good idea for the supervisor to do testing on the crane to determine if there is a buildup of inductance. This buildup of electric current could cause an electric shock or severe burns. If there is a hazard detected, you must consult with the designated competent person to determine how to eliminate the hazard.

Employee Training

You are required to instruct each employee in the recognition and avoidance of unsafe conditions and regulations applicable to the work environment to control or eliminate any hazards.

OSHA state-plan-states: Remember that certain states have more stringent safety standards that go above and beyond the OSHA standards.

Training Tips

Ask the trainees if any of them have experienced or know of anyone that have experience this type of phenomenon.

Where To Go For More Information

29 CFR 1926.550—Cranes and derricks.

29 CFR 1926.20(b)(4)—General safety and health provisions.

KELLER'S CONSTRUCTION TOOLBOX TALKS

Cranes & Derricks—Operating Cranes Near Communication Towers

You should be aware of a phenomenon that can occur when operating a crane near communication or broadcast towers. Induction of energy from the nearby antennas can cause electric shock in workers because the crane is acting as a conductor for the frequencies coming from the antennas. This type of event can happen if the towers are operating in the 30 to 100 megahertz frequency range.

Even though this is a rare occurrence, it does happen, and you need to be aware of it.

What exactly is induction?

Induction (as it relates to this phenomenon) is a process that occurs when an electrical conductor becomes electrified when near a charged body. In this case, the communication or broadcast towers are the charged body and the crane is the electrical conductor.

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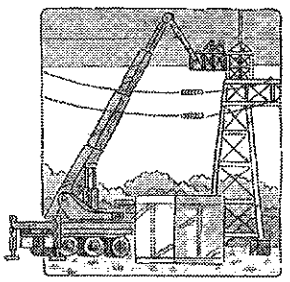

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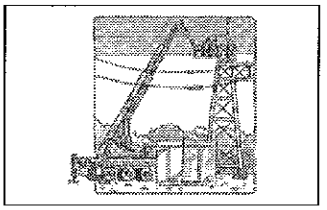
100 milliampere of induced current

OSHA has adopted, as the maximum exposure, a limit of 100 milliamperes of induced current in working environments. (200 milliamperes of current can cause heart palpitations in people.) Add to this the fact that damp environments or high humidity levels can make you a better conductor and there is the potential that the electrical charge in the crane can kill or severely injure you.

What can you do to protect yourself?

If you are operating a crane (or working around one) near a source of high power electromagnetic energy fields, it's a good idea for your supervisor to do testing on the crane to determine if there is a buildup of inductance. This buildup of electric current could cause an electric shock or severe burns.

If there is a hazard detected, your supervisor needs to consult with the designated competent person to determine how to eliminate the hazard.



Cranes & Derricks—Operating Cranes Near Communication Towers—Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Cranes & Derricks—Operating Cranes Near Communication Towers. The session covered:

- What is induction.
- Why OSHA is concerned about induction.
- What the induced current maximum exposure limit is.
- How you can protect yourself.

The space below is for employees to "sign-off" that they were in attendance.

Date of Training: _____ **Job Location:** _____

Employee Signature	Print Name Here

_____
Supervisor's Signature