

## Preventing Worker Injuries and Deaths from Mobile Crane Tip-Over, Boom Collapse, and Uncontrolled Hoisted Loads

### WARNING!

Construction and industrial workers are frequently injured or killed when working on or around mobile cranes because of tip-over, boom collapse, and uncontrolled hoisted loads.

**CRANE OPERATORS** should take the following steps to protect themselves and other workers when operating mobile cranes:

- Always use the crane manufacturer's load chart provided for each crane.
- Be sure you know or can calculate the weight of each load.
- Never use visual signs of tipping as an indicator of lift capacity.
- Before beginning a lift,
  - follow the manufacturer's procedures for proper outrigger deployment to ensure that cranes are properly set up and level, and
  - make sure outrigger pads are supported on firm, stable surfaces before beginning a lift.
- When multiple lifts are made from one location, such as during duty cycle operations, check the condition of the ground and blocking materials regularly and as often as possible to ensure the crane remains on firm, stable ground.
- Always check for overhead power lines and other obstructions. Comply with OSHA regulations for safe working distances around power lines: 29 CFR\* 1910.333(c)(3)(iii) and 29 CFR 1926.550(a)(15)(i), (ii), and (iii).



Crane tip-over at library expansion project. (Photo courtesy of The Blade/Toledo Ohio)

\*Code of Federal Regulations. See CFR in References.

- Avoid hoisting or moving suspended loads over workers and others within the crane's swing radius.
- Barricade the swing radius to keep unauthorized persons from entering areas of pinch points.
- Follow a written engineered lift plan for all critical lifts.
- If you are under age 18, do not operate a crane or assist in tasks being performed on cranes such as repairing, servicing, assembling, and disassembling the machine. For more information about Federal child labor laws, visit [www.dol.gov/dol/topic/youthlabor/index.htm](http://www.dol.gov/dol/topic/youthlabor/index.htm); or call 1-866-4-USADOL.

**Riggers and Ground Workers should take the following steps to protect themselves when working on or around mobile cranes:**

- Never work directly under a suspended load.
- Watch for signs of problems during each lift.
- Always check for overhead power lines and other obstructions. Comply with OSHA regulations for safe working distances around power lines.
- Barricade the swing radius to keep unauthorized persons from entering areas of pinch points.
- Follow a written engineered lift plan for all critical lifts.
- Follow the correct procedures when setting up or dismantling a crane. Make sure boom sections are blocked or supported before removing pins. Stay out from under the boom at all times if possible.
- If you are under age 16, do not perform any type of construction or manufacturing work. If you are under age 18, do not operate a crane

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**EMPLOYERS** should take the following steps to protect workers who work on or around mobile cranes:

- Make sure your work sites comply with safety requirements found in pertinent regulations including OSHA 29 CFR 1910.180 (general industry cranes); 29 CFR 1917.45 (marine terminals); 29 CFR 1918.66 (maritime, cranes, and derricks other than vessel's gear); 29 CFR 1926.550 (construction industry cranes and derricks); and ASME B30.5-2004, mobile and locomotive cranes.
- Conduct training to ensure crane operators understand safe crane operation as well as the principles of set-up, rigging, hoisting, extending the boom, swinging a load, pinching and crushing points, swing radius warning barriers, power line safety, etc.
- Conduct training to ensure riggers and ground workers understand the hazards of working around mobile cranes and that they watch for signs of problems at all times, especially if power lines are nearby.
- Develop and implement standard operating procedures (SOPs) for safely lifting loads.
- Develop and follow a written engineered lift plan for all critical lifts.
- When multiple lifts are made from one location (such as during duty cycle operations) check the condition of the ground and blocking materials regularly and as often as possible to ensure the crane remains on firm, stable ground.

- Ensure that mobile cranes located on floating barges are positively secured and barge list (leaning or tilt) is accounted for.
- Follow the manufacturer's recommended assembly, disassembly, and maintenance procedures when working on cranes.
- Comply with child labor laws that prohibit construction and manufacturing work by persons under age 16 and that prohibits workers under age 18 from operating or assisting in the operation, repair, servicing, assembly, disassembly, and similar activities associated with mobile cranes. For more information about Federal child labor laws, visit [www.dol.gov/dol/topic/youthlabor/index.htm](http://www.dol.gov/dol/topic/youthlabor/index.htm); or call 1-866-4-USADOL.



Mobile tower crane tip-over attempting to hoist water tank.  
(Photo courtesy of Iowa FACE Program)



Boom collapse during crane disassembly.

For additional information, see NIOSH Alert:  
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