

# Crane Critical Lifts

## Introduction

Although all crane lifts require pre-lift planning to determine factors such as load weight, crane configuration, rated capacity, and site conditions, some lifts require more extensive planning by qualified persons and are often referred to as “critical lifts”. Critical lifts require a more comprehensive lift plan to minimize the potential of crane failure and/or catastrophic loss.

There are many definitions of a critical lift used in the construction industry. [NIOSH](#) defines a critical lift as one with the hoisted load approaching the crane’s maximum capacity (70% to 90%); lifts involving two or more cranes; personnel being hoisted; and special hazards such as lifts within an industrial plant, cranes on floating barges, loads lifted close to power-lines, and lifts in high winds or with other adverse environmental conditions present. [The U.S. Army Corps of Engineers](#) also defines a critical lift to include lifts made out of the view of the operator (blind picks), lifts involving non-routine or technically difficult rigging arrangements, and any lift which the crane operator believes is critical. The Construction Safety Association of Ontario also includes lifts in congested areas, lifts involving turning or flipping the load where “shock loading” and/or “side loading” may occur, lifts where the load weight is not known, lifts in poor soil or unknown ground condition, and lifts involving unstable pieces. The [Department of Energy](#) further defines a critical lift to include lifting high value, unique, irreplaceable, hazardous, explosive, or radioactive loads. The definition of a critical lift is not as important as the planning necessary to safely perform the lift.



Dual Crane Lift

LOSS CONTROL TIPS

## Critical Lift Plan

Before making a critical lift, a critical lift plan, prepared by a qualified person such as the crane operator, supervisor, or rigger, should be considered. The lift plan should be documented in writing and made available to all personnel involved in the lift. The critical lift plan often includes the following information:

- Description of the lift
- Crane position and configuration
- Lift height
- Load radius
- Boom length and angle
- Size and weight of the load
- Percent of crane's rated capacity
- Personnel involved
- Rigging plan
- Communication method
- Ground conditions
- Environmental conditions
- Inspection procedures
- Procedures for hoisting personnel (if applicable)

The critical lift plan should document all pertinent information (i.e. load weight, crane and rigging capacities, inspections, windspeed) and should include an approval/sign-off provision. The critical lift plan should be based on the operational limitations specified by the crane manufacturer's load chart. Measured load weights, as opposed to calculated load weights, should be used when available. A sample critical lift plan is provided at the end of this document.

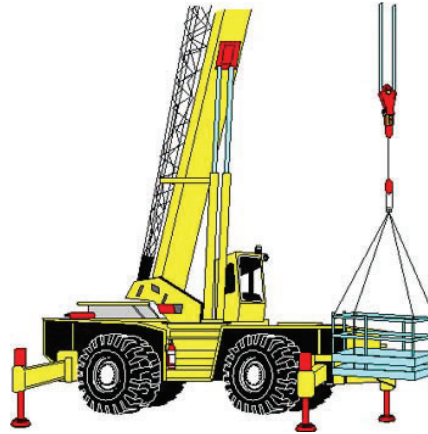
## Pre-Lift Review

A pre-lift meeting involving the participating personnel (i.e. crane operator, lift supervisor, rigger) should be conducted prior to making a critical lift. The critical lift plan should be reviewed to ensure that the project team is prepared to safely conduct the lift. Whenever feasible, a practice lift with similar crane configurations and load conditions should be conducted. Practice lifts should always be performed by the same crew, using the same lifting equipment, as those used for the critical lift.

## Hoisting Personnel

The use of a crane suspended personnel platform (basket) is prohibited by OSHA unless there is no safer, practical, conventional means of access to an elevated work area; refer to [Cranes and Derricks. – 1926.550](#) for more information. Ladders, scaffolds, stairways, aerial lifts, and personnel hoists (elevators) should be considered before using a per-

sonnel platform. If these options are more hazardous or not possible because of structural design or worksite conditions, the hoisting of personnel from a crane is permitted. The rationale for using a personnel platform should be documented in the critical lift plan.



Personnel Basket

The following OSHA requirements apply to hoisting personnel in a crane suspended platform (basket):

- The total weight of the load must not exceed 50% of the crane's load chart capacity.
- A positive locking safety latch must be on the crane hook.
- Load lines must have a safety factor of at least seven times the maximum intended load.
- Guard rails provided with a locking gate that does not swing outward.
- Weight of the platform and rated safe working load weights conspicuously and permanently marked on the platform.
- Proof testing at 125% of the platform's rating capacity is required prior to hoisting employees and after any repair or modification. Whenever the crane is moved to a new location, a new proof test is required.

A pre-lift meeting with the crane operator and other personnel involved in the lift should be performed prior to the trial lift. A proper tie-off to a structural member inside the basket or the lower load block/overhaul ball should be reviewed during the pre-lift meeting. The trial lift with the unoccupied platform loaded at least to the anticipated lift weight should be made from ground level to each location at which personnel will be hoisted. Refer to OSHA Standard 1926.550(g) for additional information on crane suspended personnel platforms.

## Crane Critical Lift Plan

### General Information

<b>Scheduled Lift Date:</b>	<b>Scheduled Lift Time:</b>
<b>Jobsite:</b>	
<b>Specific Lift Location:</b>	
<b>Lift Height:</b>	
<b>Description of Lift:</b>	

### Personnel

<b>Crane Operator:</b>	<b>Qualifications:</b>
<b>Lift Supervisor:</b>	<b>Qualifications:</b>
<b>Rigger:</b>	<b>Qualifications:</b>
<b>Hoisted Personnel (if applicable):</b>	

### Lift Criteria

- Lifting greater than 75% of the rated capacity
- Lift involving more than one crane
- Lift over occupied structures or in tight quarters
- Blind lift (out of the view of the operator)
- Lift near power lines
- Hoisting personnel
- Lift involving non-routine rigging techniques
- Lift where the center of gravity may change
- Lifting high value, hazardous, or explosive loads
- Lifting submerged loads
- Other (describe): \_\_\_\_\_

## Crane

<b>Manufacturer:</b>		<b>Model:</b>	
<b>Mobile Crane Capacity (lbs)</b>	<b>Over Rear:</b>	<b>Over Front:</b>	<b>Over Side:</b>
<b>Route of Crane Travel:</b>			
<b>Tower Crane Capacity (lbs):</b>		<b>Maximum Radius (ft):</b>	
<b>Boom Length:</b>		<b>Jib Length:</b>	
<b>Load Block</b>	<b># of Sheaves:</b>	<b>Size:</b>	<b>Weight:</b>
<b>Secondary Block</b>	<b># of Sheaves:</b>	<b>Size:</b>	<b>Weight:</b>
<b>Hoist Rope Diameter:</b>			
<b>Maximum Rated Capacity for Lift Radius and Boom Angle (lbs):</b>			
<b>Maximum Crane Load for Lift Radius and Boom Angle (lbs):</b>			
<b>Lift Rated Capacity (%):</b>			

## Load

<b>Load Weight (lbs):</b>	<b>Source of Load Weight:</b>
<b>Load Weight Confirmation:</b>	
<b>Total Rigging Weight (blocks, lifting beam, slings, shackles, rope, etc.) in lbs:</b>	
<b>Total Load Weight (load + rigging) in lbs:</b>	
<b>Note: Attach a diagram of the intended path of the load.</b>	

## Rigging

<b>Sling(s)</b>	<b>Number:</b>	<b>Diameter:</b>
	<b>Length:</b>	<b>Capacity (lbs):</b>
<b>Shackle(s)</b>	<b>Number:</b>	<b>Size:</b>
	<b>Type:</b>	<b>Capacity (lbs):</b>
<b>Note: Attach a rigging plan or diagram that identifies intended lift points, sling angles, and sling connections.</b>		

## Site Conditions

<b>Ground Conditions:</b>	
<b>Outrigger Position:</b>	<b>Mat Size (under outrigger floats):</b>
<b>Degree of Level (°)</b>	<b>Level Confirmation:</b>
<b>Maximum Allowable Windspeed in mph (per crane manufacturer):</b>	
<b>Site Windspeed Range (mph):</b>	
<b>Method of Windspeed Confirmation:</b>	
<b>Site Weather Conditions:</b>	
<b>Proximity to Other Workers (not involved in the critical lift):</b>	
<b>Proximity to Power Lines:</b>	
<b>Obstacles or Obstructions to Lift or Swing:</b>	
<b>Proximity to Other Hazards (describe):</b>	

## Communication/Signaling (check all that apply)

- Standard Signaling
- Voice
- Radio
- Telephone
- Other (describe): \_\_\_\_\_

## Hoisting Personnel

<b>Describe the rationale for selecting a personnel platform and explain why conventional methods were not used*:</b>		
<p><i>* 1926.550(g)(2): General requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions.</i></p>		
<b>Personnel Platform</b>	<b>Type:</b>	<b>Weight:</b>
	<b>Maximum Intended Load:</b>	<b>Workers in Platform (#):</b>

	<b>Load Weight:</b>	<b>Lift Rated Capacity (%)**:</b>	
<b>Confirmation of Platform Design:</b>			
<i>** 1926.550(g)(3)(i)(E): The total weight of the loaded personnel platform and related rigging shall not exceed 50% of the rated capacity for the radius and configuration of the crane or derrick.</i>			
<b>Proof Testing to 125% of the Platform's Rated Capacity</b>	<b>Date:</b>	<b>Time:</b>	
	<b>Competent Person:</b>		
<b>Trial Lift</b>	<b>Date:</b>	<b>Time:</b>	
	<b>Competent Person:</b>		
<b>Fall Protection</b>	<b>PFAS Type:</b>	<b>Anchorage:</b>	
<b>Primary Method of Communication Used:</b>			
<b>Pre-Lift Meting</b>	<b>Date:</b>	<b>Time:</b>	
	<b>Personnel:</b>		

### Inspections

<b>Crane</b>	<b>Daily Inspection Date:</b>	<b>Competent Person:</b>
	<b>Annual Inspection Date:</b>	<b>Competent Person:</b>
<b>Rigging</b>	<b>Date:</b>	<b>Competent Person:</b>
<b>Personnel Platforms</b>	<b>Date:</b>	<b>Competent Person:</b>

### Approvals

<b>Project Manager/Engineer:</b>	<b>Date:</b>
<b>Supervisor:</b>	<b>Date:</b>
<b>Crane Operator:</b>	<b>Date:</b>

## Completion/Cancellation

<b>Completion</b>	<b>Date:</b>	<b>Time:</b>
<b>Comments:</b>		
<b>Cancellation</b>	<b>Date:</b>	<b>Time:</b>
<b>Reason for Cancellation:</b>		
<b>Comments:</b>		

## For More Information

For more information on crane safety, refer to The Hartford's Loss Control TIPS on *Crane Management Programs Elevate Your Site Safety, and Cranes and Power Lines*.

For additional information specific to your need, please contact your Hartford loss control consultant, or visit us at [www.thehartford.com](http://www.thehartford.com).

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