

SCOPE

- I 1.1 This practice covers lifts associated with the erection and dismantling of plant equipment and structures. It does not cover permanent or fixed lifting equipment such as overhead trolleys, exchanger hoists, etc.
- I 1.2 **An asterisk (*)** indicates that a decision by the Owner is required or that additional information is furnished by the Owner.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I ↗ 2.1 **Table 1** lists the practice, specification, and standards which shall be used with this practice as applicable.

TABLE 1

PRACTICE	
IP 5-1-1	Pressure Vessels
IP 18-7-1	Welding Procedures
STANDARDS AND SPECIFICATIONS	
AISC Specification	
Specification for Structural Steel for Buildings - Allowable Stress Design and Plastic Design	
ANSI / ASME Standards	
B30.3	Hammerhead Tower Cranes
B30.4	Portal, Tower, and Pillar Cranes
B30.5	Mobile and Locomotive Cranes
B30.9	Slings
B30.10	Hooks
B30.20	Below-the-Hook Lifting Devices
B30.22	Articulating Boom Cranes
ASTM Standards	
A-36	Standard Specification for Structural Steel
Other Company Publication	
Exxon Onshore Crane / Lifting Safety Management Guide - Chapters 4, 5, 6 and references	

- I 2.2 **If local codes or standards exist** for the materials, design, and test methods covered in **Table 1** which yield comparable quality, they may be substituted if approved by the Owner's Engineer.

DEFINITIONS

- I 3.1 Engineered lifting components include all lugs, clips, trunnions, links, plates, spreader bars, lifting bails, and similar devices typically designed or rated by testing for use in lifting a specific vessel or piece of equipment.
- I 3.2 **Manufactured lifting equipment** includes that equipment used repeatedly for lifts of a variety of vessels and equipment at multiple locations such as mobile cranes, boom hoists, and standard off-the-shelf (catalogue) tackle, rigging, and other similar lifting components.
- I ↗ 3.3 **Rating chart** is a document or onboard computer generated graphics on which the crane manufacturer lists the maximum gross loads at various radii and boom lengths that the crane is capable of safely lifting if operated properly.
- I 3.4 **Rated capacity** is the maximum allowable gross load as defined by the manufacturer.
- I ↗ 3.5 **Cranes, covered by this IP** are land based machines that lift, lower, and swing loads at various radii. Types covered in this document include but are not limited to: crawler-mounted lattice boom; carrier-mounted lattice and telescope boom; ringer; guy derrick; pedestal; rough terrain; all terrain; boom truck and carry deck; tower cranes; and overhead and gantry-cranes.
- I 3.6 Equipment to be lifted is synonymous with structures to be lifted, as used in this practice.

MATERIALS

- R * 4.1 **All lifting components welded directly to the equipment** shall be the same material as the equipment, unless an alternate material is approved by the Owner's Engineer.
- R * 4.2 **Lifting components welded to reinforcing pads or attachments** to equipment shall be fabricated from A 36 or equivalent steel.

DESIGN

- R 5.1 Manufacturing data and engineering calculations of **weights for new equipment to be lifted** shall be increased by 10% to account for manufacturing tolerances. Calculated weights for the **removal of existing equipment** shall include the weights of all additions since installation and a minimum 25% increase factor to account for residual process materials and lifting hindrances (e.g., adhesion). **Weights obtained from a certified scale** require no increase.
- R 5.2 **Except for welded attachments to Pressure Vessels covered by IP 5-1-1, engineered lifting components** shall be designed for a lift equal to two (2) times the maximum load to be lifted, unless larger factors are required by applicable codes or standards. This factor includes impact.
- R 5.3 **All manufactured lifting equipment** shall not be loaded beyond their rated capacity.
- R 5.4 **All lifting components shall be designed** using allowable stresses in the AISC Specification for all loading conditions of the lift. Increase in allowable stresses such as those for temporary and environmental conditions are not permitted.
- R 5.5 **Engineered lifting components shall be designed** considering all potential orientations, load paths, and combined stress conditions that will occur throughout the lift, including cable directions out of the principal plane of strength of the component such as a skewed cable causing weak axis bending in a lifting lug. Lateral thrust that can result from side-to-side sway during lifting shall also be considered. Lifting lugs shall be designed for bending about the weak axis using a force equal to a minimum of 5% of the force in the sling.
- R 5.6 The **attachment weld details** for the lifting lug shall consider local effects such as stress concentrations and lamellar tearing. **All equipment to be lifted** shall be checked to insure that **stresses caused by lifting** do not exceed code allowables during all loading conditions of the lift.
- O,R 5.7 **Cranes shall be supported** on firm stable ground and the loads imposed by the crane shall not exceed the allowable bearing capacity of the soil. Foundations for cranes shall be reviewed by the Owner's Engineer.

WELDING REQUIREMENT

- R * 6.1 **All lifting component welds** shall be examined by the ultrasonic method. In-process magnetic particle examination (magnetic materials) or liquid penetrant examination (non-magnetic materials) may be substituted if approved by the Owner's Engineer.
- I 6.2 **Acceptance criteria for any examination performed on a lifting component weld** shall be per the manufacturing code to which the equipment was fabricated.

ADDITIONAL REQUIREMENTS FOR CRANES

- R 7.1 **All cranes** shall have been inspected by a qualified person (certified by local, regional or national authorities) within the past 12 months. A copy of the most recent inspection report shall be available for review by the Owner's Representative.
- R 7.2 **No crane showing evidence of repairs or modifications** shall be allowed to begin work without the manufacturer's written approval of the repair or modification.
- I 7.3 No crane shall lift any load in any configuration unless there is, in or on the crane, a current rating chart.