TEXAS WOMAN'S UNIVERSITY™

Crane, Hoist, & Rigging Safety Program

Reviewed: 06/05/2025

Office of Environmental Health & Safety

940-898-4001, option 3

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https://twu.edu/health-safety

To ensure current version see: https://twu.edu/health-safety/safety-programs/cranes-hoists-and-rigging

TEXAS WOMAN'S UNIVERSITY

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I. Introduction

Texas Woman's University (TWU) is dedicated to the protection of its employees and students from all on-the-job injuries. All employees of TWU have the responsibility to work safely on the job. The Crane, Hoist, & Rigging Safety Program applies to all TWU faculty, staff, and students who operate and/or are responsible for cranes, hoists, and rigging. Moving large, heavy loads may involve the use of specialized lifting devices such as cranes, hoists, and rigging. There are significant safety issues to be considered, both for the operators and for individuals in proximity to them. The goals of the Crane, Hoist, & Rigging Safety Program are to supplement the University's standard of safety by providing additional safety standards when operations are conducted that use University-owned overhead cranes, hoists, and rigging and ensure that each individual is trained and made aware of the requisite safety provisions prior to the start of work.

A. Scope

This Crane, Hoist, & Rigging Safety Program establishes the precautions, training, responsibilities, requirements, and methods which are to be used by all TWU employees and students while working or operating University-owned overhead cranes, hoists, and rigging. This program governs the maintenance, inspection, load testing, rigging inspection and selection, as well as operator training and qualification requirements for all types of cranes and hoists that are used for lifting or moving equipment and material.

B. Purpose

This program is designed to enable employees and students to recognize the hazards of crane operation at TWU and to establish the procedures to be followed to prevent injury to persons or equipment. Each employee operating cranes, hoists, and rigging will be trained in these procedures and strictly adhere to them, except when doing so would expose the employee to a greater hazard. In such a situation, the employee is to notify TWU's Office of Environmental Health & Safety (EH&S) of their concerns; these will be addressed before proceeding.

C. Review of Program

The Crane, Hoist, & Rigging Safety Program will be reviewed at least once a year by EH&S. This review will encompass changes in regulations, newly identified safety hazards related to cranes, hoists, and rigging, changing demands of the program for the campus, and changes in technology.

D. References

- 29 CFR 1910.179 – General Industry Materials Handling and Storage – Overhead and gantry cranes.
- 29 CFR 1926.552 – Construction Industry Helicopters, Hoists, Elevators, and Conveyors-Material hoists, personnel hoists, and elevators.
- 29 CFR 1926.554 – Construction Industry Helicopters, Hoists, Elevators, and Conveyors-Overhead hoists.
- 29 CFR 1926.958 – Construction Industry Electric Power Transmission and Distribution-Materials handling and storage.
- Texas Woman's University Regulations and Procedures Policy 04.430: Environmental Health and Safety

II. Definitions

- *Bridge* – The part of a crane consisting of girders, trucks, end ties, foot walks, and drive mechanism which carries the trolley(s).
- *Bridge crane* – Crane with bridge mounted on tracks, which enables three-dimensional handling.
- *Bridge travel* – Crane movement in a direction parallel to the crane runway.
- *Crane* – A machine for lifting or lowering a load, and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. It may be driven manually or by power and may be a fixed or a mobile machine, but does not include stackers, hoist trolleys, lift trucks, power shovels, backhoes, or excavators.
- *Drum* – Cylindrical member around which rope/chains are wound for raising/lowering loads.
- *Floor-operated crane* – Crane which is pendant- or rope-controlled by an operator on the floor or platform.
- *Gantry crane* – A crane similar to an overhead crane, except the bridge for carrying the trolley is rigidly supported on two or more legs running on fixed rails or other type of runway.
- *Hand-held hoist* – Lever-operated roller chain hoist.
- *Hoist* – An apparatus for raising or lowering a load; may be part of a crane.
- *Overhead crane* – Crane with a movable bridge carrying a movable or fixed hoist mechanism and traveling on an overhead fixed runway structure.
- *Pawl* – Device used to hold machinery against undesired rotation by engaging a rachet.
- *Pendant* – Controls suspended from an electric hoist.
- *Power-operated crane* – A crane whose mechanism is driven by electric, air, hydraulic, or internal combustion.
- *Qualified person* – A person designated by the department who, by reason of training and/or experience, has demonstrated the ability to safely perform all assigned duties. Persons may be deemed "qualified" to operate all or only specific cranes/hoists within a department by their supervisor. "Qualifying" a crane operator is a documented process (see Appendix A) as outlined in this program.
- *Rated load* – The maximum load for which a crane or individual hoist is designed and built by the manufacturer and shown on the equipment nameplate(s).
- *Rigging* – Collectively referred to as "below the hook" devices, are also called "lift gear". May be any device used to carry, position, and secure a load while it is being hoisted or craned.
- *Semi-gantry crane* – A gantry crane with one end of the bridge rigidly supported on one or more legs that run on a fixed rail or runway, the other end of the bridge being supported by a truck running on an elevated rail or runway.
- *Sling* – Lifting devices such as chain, wire rope, metal mesh, fiber rope, and synthetic web utilized to secure a load to be moved.
- *Trolley* – The unit which travels on the bridge rails and carries the hoisting mechanism.

III. Responsibilities

A. Department Supervisors

Department supervisors or heads of areas where cranes, hoists, and/or rigging are operated must:

- Designate and identify personnel authorized to operate cranes, hoists, and rigging ("Qualified Person")

- Provide for and document each Qualified Person's operator training prior to allowing them to inspect, maintain, and/or operate specific department crane equipment
- Conduct documented periodic inspections of all crane/hoist equipment and associated rigging
- Ensure cranes, hoists, and rigging are maintained in proper working order and repaired when necessary
- Ensure scheduled inspections and testing is conducted as required by the equipment being utilized

B. Qualified Person

The qualified person or crane operator is responsible for the following:

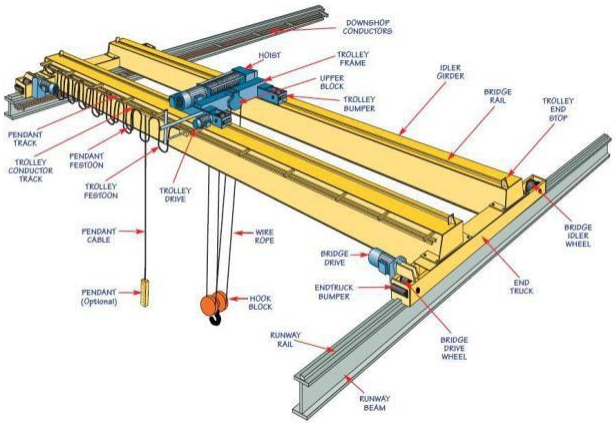
- Attending and passing training and evaluation of competence prior to operating a crane, hoist, or rigging
- Must be qualified by their supervisor through documentation using Appendix A, to be kept in their employee file
- Performing and documenting pre-use inspections
- Reporting all maintenance/repair issues to their supervisor and removing the equipment from service if necessary
- Operating and maintaining equipment in a safe manner at all times

C. Environmental Health & Safety

TWU's Office of Environmental Health & Safety (EH&S) must:

- Ensure crane, hoist, and rigging training programs meet applicable requirements
- Conduct periodic audits of Crane, Hoist, & Rigging Safety Program compliance
- Update Crane, Hoist, & Rigging Safety Program per regulations or University requirements
- Provide program oversight

IV. Types of Cranes, Hoists, and Rigging

Gantry Crane	Semi-Gantry Crane
	
Floor-Operated Crane	**Bridge Crane**
	
Electric Powered Hoist	**Manual Hoist (lever, chain fall, come along)**
	

Pneumatic Powered Hoist	Chain Sling
	
Metal Mesh Sling	**Wire Rope Sling**
	
Synthetic Web Sling	**Fiber Rope Sling**
	

V. Design and Safety Requirements

The design of all cranes and hoists constructed after 1971 must comply with the requirements of the American Society of Mechanical Engineers (ASME) and American National Standards Institute (ANSI) B.30.2.0-1967 standards for crane construction and the Crane Manufacturer's Association of America standards CMAA-70-2010 and CMAA-74-2010. Other safety requirements include:

- The rated load of the crane/hoist must be plainly marked on each side; if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block, which must be clearly visible from the floor
- Cranes with parallel runways must always maintain clear path of travel for the crane
- Trolley stops and/or bumpers should be provided to limit the travel of the trolley along the runway and be capable of sufficiently stopping the trolley
- Guards shall be in place for all moving parts where there is potential for hazardous contact or wearing could occur
- Crane/hoist electronic controllers should be equipped to shut the crane/hoist to the "off" position as a fail-safe
- Hooks used as part of crane/hoist operation must be equipped with a safety latch to prevent loads from bouncing off the hook
- A minimum clearance of 3 inches overhead and 2 inches laterally must be provided and maintained between the crane/hoist and any obstruction
    - Where passageways, foot walks, or walkways exist, their placement must not present a hazard to employees when cranes/hoists are in use
- Only qualified person(s) who have been properly trained may operate cranes, hoists, and rigging

VI. Crane and Hoist Operation Requirements

A. Pre-Operational Test

At the start of each work shift (on a day when the crane will be used), qualified person(s) should complete the following steps to ensure the crane is operating properly, as applicable:

- Test the upper limit switch: raise the unloaded hook block until the limit switch trips
- Visually inspect the hook, load lines, trolley, and bridge as much as possible from the operator station (this is typically at floor level)
- If provided, test the lower limit switch
- Test all direction and speed controls for both bridge and trolley travel
- If equipped, test bridge and trolley limit switches when crane use will come close to tripping these switches
- Test the hoist brake

- If any of the above items do not pass the pre-operational inspection, the crane/hoist must be locked out and removed from service immediately
- Appendices B and C provide pre-operational checklists; pre-operational inspections should be documented

B. Rigging a Load

When attaching a load to a crane, the following safety requirements should be followed:

- Determine the accurate weight of the load and ensure crane/hoist weight limitations are not exceeded
- Determine the appropriate size and number of slings and associated rigging components
- Sharp edges on loads being lifted/lowered should be padded to prevent wear on slings
- Ensure slings and hooks are in proper working condition with no excessive wear
- Determine the center of gravity of the load and ensure rigging maintains the load level during movement
- Once slings are in place, lift the load only slightly off the ground to test the rigging and balance, re-working the rigging if necessary
- Use a tag line when loads must traverse long distances or be otherwise controlled

C. Lifting and Lowering a Load

During equipment moving operations, the following safety requirements should be followed:

- Only qualified person(s) may operate a crane or hoist
- Ensure unauthorized entry does not occur during use and maintain proper clearance
- Cranes and hoists should only be operated with a qualified person(s) and at least one spotter; communication between the crane and/or hoist operator and spotter must be discernible or audible at all times
    - If audio (voice/radio) communication between crane and/or hoist operator and spotter is not possible, a third-party vendor should be contracted to complete the task
- Ease the load up/down to prevent shock load on the crane or hoist. Shock load can occur when a suspended load is accelerated/decelerated quickly
- Lift loads only high enough to clear the tallest obstruction in the travel path
- Never lead suspended loads unattended
    - In an emergency, if a load must remain suspended, ensure the area is clearly marked with signage and blocked on all four sides to prevent unauthorized access

D. Parking a Crane or Hoist

Once loads are removed and the crane and/or hoist is out of operation for a shift, it should be properly parked.

- Remove all slings and rigging from the hook and return rigging devices to designated storage locations

- Raise the hook at least 7 feet above the floor
- Store the pendant away from aisle and work areas or raise it at least 7 feet above the floor
- Place the emergency stop switch in the "off" position and place controller in the designated storage location to prevent unauthorized use

VII. Inspection, Maintenance, and Testing

Cranes, hoists, and rigging must be continuously inspected to ensure accidents do not occur. The pre-operation inspection must be conducted before each use as outlined in the **Pre-Operational Test** section of this program.

A. Monthly Inspections

Cranes and hoists should be inspected monthly, regardless of use. Monthly inspections should be conducted by someone familiar with the crane or hoist and its operation, and inspections should be documented. Defective cranes and/or hoists must be removed and locked out of service until defects are corrected. Checklists used in the field should be specific to the crane and/or hoist being inspected. Appendix D provides a sample monthly crane/hoist inspection checklist. Consult the manufacturer's specifications to develop or obtain a monthly checklist.

B. Annual Preventative Maintenance

Cranes and hoists should be inspected annually for preventative maintenance. Cranes and/or hoists that sit idle for longer than 12 months or are unused should be inspected prior to anticipated use. A properly trained crane and/or hoist specialist designated by the department supervisor or a third-party company should perform and document the annual preventative maintenance service. A sample annual checklist can be found in Appendix E. The annual inspection should address, at a minimum, the following items:

- Hoisting and lowering mechanisms
- Trolley and bridge travel
- Limit switches and safety devices
- Structural members
- Bolts or rivets
- Sheaves and drums
- Moving parts, such as bearings, shafts, gears, rollers, and locking and clamping devices
- Fuel, electric, or other power parts
- Chain-drive sprockets
- Crane and hoist hooks
- Electrical controllers, limit switches, and push-button stations
- Slings (wire, metal mesh, fiber mesh, rope, etc.)

Specific inspection items may vary depending on the type of crane and/or hoist being inspected. It

is the responsibility of the supervisor to ensure the manufacturer's specified inspection checkpoints are covered during the annual preventative maintenance service.

C. Load Testing on Newly Installed or Recently Repaired Cranes and Hoists

Newly installed cranes and hoists, and those which have undergone sufficient repairs or have been re-rated, should be load tested at 125% of the rated load. Slings should be accompanied by load test data upon purchase. Any time a crane and/or hoist is overloaded during use, it shall be inspected before returning to normal use.

VIII. Training

Only designated trained persons are permitted to operate a crane or hoist, referred to as "qualified person(s)". Training should include, at a minimum, the following:

- Classroom/online informational training, which should include the following:
    - General crane and hoist safety
    - Crane and hoist inspections
    - Attaching, raising, lowering, and moving loads
- Hands-on training with the specific equipment to be used as part of their job duties, to include the following:
    - Specific controls for the crane and/or hoist
    - Specific slings used with loads
    - Specific handling instructions as provided by the manufacturer
- Written examination
    - Both the classroom and hands-on training should be documented through an examination process; see Appendix A

IX. Recordkeeping

Each department is responsible for maintaining records relating to cranes in use at TWU. Records to be maintained include the following:

- Specification/operator manuals for all cranes and hoists
- Training records, to include the name of trainer and employee, date of training, and type of training
- Pre-use, monthly, and annual inspection records
- Maintenance and repair records

A. Non-Standard Crane-like Lifting Devices

Non-standard devices and equipment used for lifting people or equipment should be used as designated and engineered and should be maintained as required by the manufacturer. Each such device can be evaluated by TWU EH&S for suitability and safety of personnel.

X. Contractors

Contractors are required to have their own specific crane, hoist, and rigging safety programs and allow only fully trained crane operators to operate equipment on TWU's campuses. Contractors using non-TWU cranes must ensure cranes are properly maintained and have been recently inspected to ensure safe operation. Contractors are permitted to use University-owned cranes with written authorization from the department claiming ownership of the crane. All applicable standards, regulations, and TWU Written Programs must be followed.

Appendix A

Crane & Hoist Qualified Person Documentation

Employee Name: _____ **Date:** _____

TWU Username: _____ **Department:** _____

Supervisor: _____ **Date:** _____

This document confirms the qualification of the above-named employee to perform *(check all that apply)***:**

☐ Operate/inspect overhead cranes and hoists within their department

☐ Inspect rigging and rig loads to be suspended within their department

☐ Other

This designation is based on evidence of safe performance of all duties related to crane/hoist operation and verification by another qualified person through *(check all that apply)***:**

☐ *Training*: Appropriate training records (including any skill checks or tests) are attached.

☐ *Experience*: This employee has been safely performing and has demonstrated skill in crane/hoist operation for _____years (minimum of five years).

☐ *Instruction*: This employee has received on-the-job instruction from a qualified person, has observed this person's work while performing this operation, and confirms that the employee has the knowledge to perform crane/hoist work safely.

If, for any reason, as their supervisor, I think that this employee is not performing this operation safely, this qualification will be revoked. Below are the signature(s) of the responsible person(s) verifying training, experience, and/or providing instruction:

Supervisor Signature: _____ **Date:** _____

Qualifying Person (if not supervisor): _____ **Date:** _____

Employee Signature: _____ **Date:** _____

CC: TWU EH&S, departmental employee personnel files

Appendix B

TWU Pre-Operational Crane & Hoist Inspection Form

CRANE & HOIST OPERATOR DAILY INSPECTION CHECKLIST								
Crane/hoist ID				Type			Date of inspection	
Load capacity				Location				
Total hours operated				Start time			Stop time	
INSTRUCTIONS: Check all items indicated. Inspect and indicate as **S**atisfactory (S), **U**nsatisfactory (U), or **N**ot **A**pplicable (N/A).								
Walk Around Inspection	**S**	**U**	**N/A**	*Operator Cab Inspection*	**S**	**U**	**N/A**	**Notes**
Safety guards and plates				Gauges				
Carrier frame, rotate base				Warning & indicator lights				
General hardware				Control/brakes				
Wire rope				Visibility				
Reeving				Load rating charts				
Block				Safety devices				
Hook				Emergency stops				
Sheeves				List/trim indicators				
Boom/jib				Boom angle/radius indicator				
Gantry, pendants, boom stops				*Machinery House Inspection*	**S**	**U**	**N/A**	**Notes**
Walks, ladders, handrails				Housekeeping				
Wind locks, chocks, stops				Engine/compressor				
Tires, wheels, tracks				Leaks: fuel, lube, oil, water				
Leaks: fuel, lube, oil, water				Lubrication				
Radius indicator				Battery				
Outrigger/locking device				Lights				
Operation Inspection	**S**	**U**	**N/A**	Glass				
Area safety				Clutch/brake linings				
Unusual noises				Electric motors				
Control action				Warning tags				
Brakes/boom/load/rotate				Fire extinguisher				
Crane stability				**COMMENTS**				
No load test								
Fleeting sheeve								
Limit switches								
Other:								
SIGNATURES								
Operator's Signature				Supervisor's Signature				

Appendix C

TWU Pre-Operational Crane & Hoist Inspection Form: Abbreviated

CRANE/HOIST INSPECTION FORM								
Crane/hoist ID			Type			Date of inspection		
Load capacity			Location					
Total hours operated			Start time			Stop time		
INSTRUCTIONS: Check all items indicated. Inspect and indicate as Satisfactory (S), Unsatisfactory (U), or Not Applicable (N/A).								
Visual Inspection	**S**	**U**	**N/A**	*Control Inspection & Tests*	**S**	**U**	**N/A**	**Notes**
Hook & slings				Upper/lower limit switches				
Hoist				Bridge & trolley limit switches				
Trolley & bridge				Direction & speed controls				
Leaks: fuel, lube, oil, water				Hoist brake				
Operation Inspection	**S**	**U**	**N/A**	**COMMENTS**				
Area safety								
Unusual noises								
Load stability/tag line								
Other:								
Operator's Signature				Supervisor's Signature				

CRANE/HOIST INSPECTION FORM								
Crane/hoist ID			Type			Date of inspection		
Load capacity			Location					
Total hours operated			Start time			Stop time		
INSTRUCTIONS: Check all items indicated. Inspect and indicate as Satisfactory (S), Unsatisfactory (U), or Not Applicable (N/A).								
Visual Inspection	**S**	**U**	**N/A**	*Control Inspection & Tests*	**S**	**U**	**N/A**	**Notes**
Hook & slings				Upper/lower limit switches				
Hoist				Bridge & trolley limit switches				
Trolley & bridge				Direction & speed controls				
Leaks: fuel, lube, oil, water				Hoist brake				
Operation Inspection	**S**	**U**	**N/A**	**COMMENTS**				
Area safety								
Unusual noises								
Load stability/tag line								
Other:								
Operator's Signature				Supervisor's Signature				

Appendix D

Sample Monthly Crane/Hoist Inspection Checklist

Crane Inspection & Certification Bureau
P.O. Box 621388
Orlando, FL 32862-1388
(800) 327-1386 * (407) 277-0884
www.cicb.com

CICB Overhead Crane/Hoist Monthly Checklist

Crane ID #: _____ Capacity: _____

Mark the appropriate boxes S - Satisfactory U - Unsatisfactory N - Not Applicable	Reference Standard	Machine Description & Number Month Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Controls													
Support Against Strain	B30.2-1.13.1 (d)												
Identification/labels	B30.2-1.13.1 (e)												
Warning Labels/decals	B30.2-1.1.5 (a)												
General Condition	B30.2-1.1.2 (c)												
Hook													
Safety Latch	1910.179 (j)(2)(iii)												
Deformation	B30.10-1.2.1.2 (c)(1)												
Wear	B30.10-1.2.1.2 (c)(2)												
Cracks, Nicks, Gouges	B30.10-1.2.1.2 (c)(3)												
Attachment Points	B30.10-1.2.1.2 (c)(6)												
Self-Locking Operation	B30.10-1.2.1.2 (c)(7)												
Chain													
Operation	B30.16-2.5.1 (a)												
Lubrication	B30.16-2.5.1 (b)												
Defects/wear	B30.16-2.5.1 (c)												
Wire Rope													
Distortion	B30.2-2.4.1 (a)(1)(a)												
Corrosion	B30.2-2.4.1 (a)(1)(b)												
Broken Wires/cuts	B30.2-2.4.1 (a)(1)(c)												
Reeving	B30.2-2.1.1 (c)(6) & 1910.179 (j)(2)(vii)												
Structure													
Load Rating Marked	B30.2-1.1.1												
Defects, Cracks, Welds	B30.2-2.1.3 (b)(1)												
Air System	B30.2-2.1.2 (e)(3) & 1910.179 (j)(2)(ii)												
Hydraulic System	B30.2-2.1.2 (e)(3) & 1910.179 (j)(2)(ii)												
Bridge													
Wear/defects	B30.2-2.1.2 (e)(1) & 1910.179 (j)(2)(vi)												
Trolley													
Wear/defects	B30.2-2.1.2 (e)(1) & 1910.179 (j)(2)(vi)												
Hoist													
Wear/defects	B30.2-2.1.2 (e)(1) & 1910.179 (j)(2)(vi)												

Appendix E

Sample Annual Crane/Hoist Inspection Checklist

IT MUST INSPECTED YEARLY BY A CERTIFIED PERSON		PAGE 1 OF 1
SAFETY, AND HEALTH PROGRAM	ATTACHMENT:	NA

HOIST ANNUAL INSPECTION CHECKLIST

Hoist ID: _____ Date: _____

Inspector: _____

No.	Inspection Point	Pass	Fail	Comments
	HOIST			
	Drum wear, cracks (un-spool all rope)			
	Rope anchorage			
	Worn or cracked pins, bearings, shafts, gears, rollers, locking or clamping devices			
	Excessive wear of brake and clutch system, pawls, ratchets			
	Excessive wear of drive mechanism, chain, chain sprockets.			
	Electrical system for evidence of contact pitting or deterioration of controller, limit switches, pushbuttons.			
	Fire extinguisher charge			
	Power plant performance			
	Load control mechanisms for maladjustments, wear			
	Limit switches or devices			
	Deterioration or leakage of hydraulic systems			
	Fuel system leakage or deterioration			
	Electrical and control system malfunction or deterioration			
	Engine oil level			
	Hydraulic oil level			
	Fuel level			
	Other lubrication			
	Mounting/anchorage system for continued ability to sustain imposed loads.			
	WIRE ROPE			
	Inspect entire length of wire rope.			
	Obvious visible damage, kinking, crushing, deterioration, wear, distortion, broken wires.			
	Reduction of rope diameter, loss of core support, corrosion.			
	Broken wires or corrosion at end connections			
	End connections and fittings, corrosion			

Comments:

IF THE UNIT DOES NOT PASS FULLY IT MUST BE TAGGED OUT OF SERVICE