

COURSE: NR11/18/34 – COMPLEMENTARY COURSE OF HOISTING EQUIPMENT – SAFETY IN GANTRY CRANE OPERATIONS

SCOPE AND APPLICABILITY:

Train participants to perform cargo handling cranes according to Brazilian standards, International and corporative safety operations. Provide knowledge to select and properly inspect the equipment and accessories required for each kind of operation.

REGULATIONS & STANDARDS

- NR-11 - Transport, Handling, Storage and Material Handling - Annex III;
- NR-18 - Working Conditions and Environment in the Construction Industry;
- NR-34 - Working Conditions and Environment in the Shipbuilding and Repair Industry;
- ABNT NBR15466 - Qualification and certification of crane, gantry and semi-gantry operators;
- Maritime Professional Education - COPR - Onboard Crane Operation Course;
- API RP 2D 7ed.;
- OSHA 1910.179 - Overhead and gantry cranes – Materials Handling and Storage;
- OSHA 1910.1438 - Overhead and gantry cranes – Cranes and Derricks in Construction.

COURSE CONTENT:

a) Occupational Accident and its prevention;

- Concept of accidents at work: legal
- Concept of occupational accidents: preventive
- Typical types of accidents involving overhead cranes
- Load shock
- Shock between two load blocks.
- Work Accident Reporting - CAT
- Consequences of accidents at work

Risk analysis

- Environmental risks: physical, chemical, biological
- Ergonomic and accident related risks
- Operational limitations
- Cargo lashing;
- Disposal criteria for steel cables, straps and chains;
- Inspection and safety records;
- Risk Analysis Methodologies: concepts
- Check the conditions of the crane, gantry and semi-gantry operating area;
- Observe possible failures or abnormal conditions that may imply the suspension of the crane, gantry and semi-gantry and, or cause accidents.
- Identification of unsafe acts and conditions;
- Toolbox
- Prevention procedures

Signaling

- International Signaling Convention
- Signposting guidance on board and on land
- Traffic sign

Emergency Procedures

- First aid

Notions of fire prevention and fighting:

Environmental preservation;

Notions of safety signs;

General quality concerns:

b) Collective and Personal Protection Equipment

c) Applicable provisions of the Regulatory Standards

- NR-06 - Personal Protective Equipment (PPE)

- NR-10 - Security in Installations and Services in Electricity
- NR-11 - Transport, Handling, Storage and Material Handling
- NR-12 - Safety at Work in Machines and Equipment
- NR-17 - Ergonomics
- NR-18 - Working Conditions and Environment in the Construction Industry

International Operating Standards

- Step-by-step safety procedures prior to operation
- Pre-Operation and Post-Operation
- Operator conduct
- Tension created by the Angles of the Sling
- Selection of the coupling and its applications
- Explain the importance of locking / unlocking “twistlocks” when operating with containers
- Special care when using automatic twist-locks

d) Hoisting equipment

Electricity, mechanics and mathematics (basic knowledge)

- Basic electricity:
 - Ohm's law;
 - Basic concepts of direct and alternating current circuit;
 - Electrical measurements;
 - Basic concepts of electrical grounding;
- Units of measurement:
 - Angle;
 - Volume;
 - Area;
 - Weight;
 - Pasta;
 - Speed;
- Basic lubrication;
- Gravity center.

Types of Overhead Cranes

- Main types of overhead cranes used on ships, emphasizing the differences between the models
 - Overhead crane,
 - Portico;
 - Semi-portico;
- Main components of overhead cranes, highlighting the translation system and operational safety mechanisms
 - Structure;
 - Main car;
 - Electrical supply;
 - Engines;
 - Reducers;
 - Couplings;
 - Wheels;
 - Axles.
- Principles of operation and limitations:
 - Brakes
 - Engines
 - Drives;
 - Commands;
 - Safety devices.
- Advantages and disadvantages of overhead cranes over earth and portain cranes

Instruments and Controls

- Different movements performed by overhead cranes
- Introduce the translation system
- Container lift system (“spreader”) and other cargo
 - Container Ovator
 - Mesh
 - Electromagnets
 - Grips:
 - Load bars:
 - Hooks C
 - Buckets.

- Instruments and controls in the operator's station
- Assess the equipment's operating conditions
- Follow established standards of hygiene, quality and protection of the environment
- Cargo operation and handling;
- Types of equipment: Shackles
- Types of equipment: Straps
- Strap loading capacity
- Types of equipment: Support links (Pears)
- Equipment types: Hooks - Gauges and Capacities
- Types of equipment: Eyelets
- Choice of types of steel cables (slings)
- Load capacity of steel cables
- Lubrication of steel cables.
- Equipment types: Chains
- Load capacity of chains
- Strings
- Accessories to ensure good lashing
- Use of corner breakers
- Main dimensions of containers
- Safety inspections on equipment
- Load storage.

e) Special risk situations

- Handling of loads in the vicinity of a live electrical network
- Adverse weather conditions
 - Wind
 - Atmospheric discharges
 - Others - balance sheet
- Close to equipment limitation
- Blind lift

f) Workstation ergonomics

- NR17 Ergonomics

g) Practical exercises

- Risk Analysis Methodologies: practical exercises
- Carry out precautionary measures before starting the operation
- Perform operational procedures on the equipment
- Perform movements without load
- Perform movements with load

h) Final Assessment

COURSE DESIGN:

When NR11 and/or NR34 are mentioned in the certificate: Theory – 10 hours, Practical – 10 hours;

If NR-18 is mentioned in the certificate: Theory – 12 hours, Practical – 8 hours;

TOTAL: 20 Hours.

PREREQUISITE(S):

Have previously performed Rigging & Slings training.

MINIMUM/MAXIMUM NUMBER OF DELEGATES

This course requires a minimum of 1, and a maximum of 12 participants.

To offshore trainings, the course number of attendees will comply with the vessels/rig necessity.

MAIN SAFETY ISSUES:

- Do not put your hand on the load;
- Do not pass under load;
- Do not positioning the body parts between suspended loads;
- Know and use standardized hand signals as a primary means of communication;
- Conduct pre-shift meetings;
- Conducting risk analyses;
- Night work;
- Unfavorable weather conditions;
- Communication between team and operator;
- Knowledge of company policies on security with rigging slinging.

REQUIRED EQUIPMENT:

- Slings;
- Steel wire rope;
- Shackles;
- Hoist equipment;
- Radios;
- Flags waistcoats;
- Lifting accessories;
- Gantry Crane.

PROCEDURE FOR PRACTICAL EXERCISES:

- Reinforce with the students the safety procedures adopted by the company/contractor;
- It is allowed to the trainer to use real situations if the deck operator and safety officer approve it. In this case the instructor will reinforce safety key behaviors and positioning;
- Show how to plan lift operations;
- Perform general and safety checks of cranes, lifting equipment and loads;
- Safely and correctly use rigging hardware on-the-job, relative to rigging and slinging tasks;
- Inspect and select slings for rigging and slinging tasks;
- Body positioning;
- Carry out correct communication procedures (Manual and Radio);
- Perform an assessment of risks and hazards.

CERTIFICATION:

Training certificate signed by responsible Engineer accredited by Brazilian CREA.

CERTIFICATE VALIDITY PERIOD:

2 years if the certificate includes NR-18;
3 years if the certificate includes NR-11;
4 years.

New training must be carried out, with workload and program content that meet the needs that motivated it, in the situations provided below:

- a) change of position;
- b) exchange of methods and work organization;
- c) return from work leave or inactivity, for a period exceeding six months;
- d) significant changes in facilities, operation of machines, equipment, or processes different from those that the worker is used to operating.