Crane Operations Safety

COURSE: NR-11/34/37-API/LOLER/NORSOK – COMPLEMENTARY SAFETY COURSE FOR CRANE OPERATORS

SCOPE AND APPLICABILITY

Capacitate participants to perform cargo handling operations with cranes in accordance with Brazilian, International and corporate safety standards. Provide knowledge to properly select and inspect equipment and accessories required for each operation.

REGULATIONS AND STANDARDS

- API RP 2D 7ed;
- PUWER 1998;
- LOLER;
- NORSOK Standard R-003;
- NBR 13541;
- Board Crane Operation Course (COGB);
- NR-11 - Transport, Handling, Storage and Material Handling;
- NR-18 - Conditions and Work Environment in the Construction Industry;
- NR-34 - Annex I - Complementary Course for Crane Equipment operators;
- NR-37 - Health and Safety in Oil Rigs;

COURSE CONTENT:

a) Platform cranes:

- Introduction to safety in the operation of Cranes;
- History, definitions and characteristics of cranes (assembly and installation);
- Types of equipment (mechanical and non-mechanical);
- Standard components in each type of crane;
  - lifts;
  - cargo lifts;
  - Hoisting cranes;
  - forklifts;
  - Cranes;
  - Hoists;
  - Winches;
  - Treadmills;
  - loading sticks;
  - Conveyors of different types;
- Operational Characteristics;
  - Number of line pieces and relation to nominal load;
  - Lifting capacity of main and auxiliary hook;
  - Load and boom winch drums (speed vs. line);
  - Mounting characteristics of the rotating superstructure;
  - Types of lifting structure;
- Operational procedures;
  - Initial operation procedures:
    - Start the crane;
    - Check the route;
    - Control instruments on the panel;
    - Check the situation of stairs and floors of the various levels of the crane;
    - Load lifting plan;
- Inspection and Maintenance of Equipment and Accessories:
  - Pre-departure, pre-operational and post-operation checks;
  - Identification of sheave-blocks and working devices;
  - Weight and stroke safety devices;
  - Construction, mechanics, grades, designation and characteristics of wire rope;
  - Ropes;
  - Chains;

- Pulleys;
- hooks;
- Brakes;
- Turning system;
- clutches;
- controls;
- Boom mechanisms;
- Anemometer;
- displacement mechanism;
- Levels of lubricants, fuel and refrigerant;
- Audible and luminous signals;
- electromagnet;
- Windshield wiper;
- Fluid and fuel leaks;
- Abnormal noise and vibration.

- emergency;

b) existing safety and protection devices;

- Cabin instruments and controls;
- End of limit sensor;
- Emergency Stop Device;
  - Use and reset the emergency pushbuttons after activation.
- Preliminary Risk Analysis;
- Accidents at work and prevention methods;

c) Load capacity tables and lifting angles;

- Study of loading;
- Load capacity tables and graphs;
- lifting angles;
- Boom angle indicator, length and radius, swing system;
- Gravity center;
- Boom deflection;
- principles of leverage;
- Principles of lifting;
- Types of elevation;

d) Lifting operations:

- Cargo transport;
- Transport of people;
- Rigging and Slinging;

f) Applicable provisions of the Regulatory Standards;

- **NR-17 - Ergonomics in the workplace;**
- NR-06 - Applicable Collective Protection Equipment;
- NR-06 - Applicable Individual Protective Equipment;
- NR-10 - Care with energized elements;
- NR-11 - Cargo Handling;
- Applicable NR-12 devices for cranes;
- Work conditions existent on civil construction environment;
- NR-34 - For Shipbuilding;
- NR-37 - For Platforms;

e) Special situations and risk, such as:

- Cargo movement in the vicinity of energized electricity network;
- Explain caution to the cab watchmen to prevent malfunctions during operation.
- Climatic and maritime conditions (Beaufort scale and wind speed);
- Cargo transfer between vessels (offload and backload);
- Simultaneous operations (SIMOPs);

g) Practical exercises of operation:

- depth perception;
- situations on board the platform;
- Signaling and Communication during operations;

h) Final evaluation.

COURSE DESIGN:

Theory – 12 hours
Practice – 08 hours
TOTAL: 20 hours

PREREQUISITE(S):

Have previously carried out the Cargo Handling/Rigging and Slinging training, considering the following conditions:

- If used as an API, cargo handling training must consider valid training based on API RP2D 7ed;
- In case it is used as NR-37, the training of movement of loads and people must be valid according to the company's internal procedure, or in case of omission, 4 years (according to API);

MINIMUM/MAXIMUM NUMBER OF DELEGATES

This course requires a minimum of 2 and a maximum of 40 participants in theoretical classes and a maximum of 8 people for practical demonstrations.

For offshore training, the number of course participants will meet the needs of the vessel.

MAIN SAFETY ISSUES:

- Do not put the hand on the load;
- Do not pass under the load;
- Do not position body parts between suspended loads;
- Know and use standard hand signals as the main means of communication;
- Hold pre-shift meetings;
- Conducting risk analysis;
- Night work;
- Unfavorable weather conditions;
- Communication between team and operator;
- Knowledge of company policies regarding security with cargo handling;

NECESSARY EQUIPMENT:

- Slings;
- Wire ropes;
- Shackles;
- Hoisting equipment;
- Radios;
- Signaling vests;
- Lifting accessories.

PROCEDURES FOR PRACTICAL EXERCISES:

- Reinforce with the students the incident / safety procedures adopted by the company;
- Instructor is allowed to use real-world situations to reinforce Training concepts if area manager and safety officer approve. In this case, the instructor will reinforce safe behavior and positioning predominantly;
- Demonstrate how to plan lifting operations;
- Perform general inspections on hoisting equipment and cargo lashings;
- Inspect and select slings for tasks related to cargo handling;
- Secure positioning;
- Demonstration of how to use communication protocols correctly (Manual and Radio);
- Conduct risk and hazard analysis in accordance with company procedures.

CERTIFICATION:

Certificate of formation signed by the responsible engineer accredited by the Brazilian CREA.

CERTIFICATE VALIDITY PERIOD:

Recommended: 3 years.