

Crane's Operation & Lifting Hazards

Understanding the risk

Crane operations pose a high risk to the adjacent areas as they are used for lifting heavy loads and transporting utilities at elevations that could reach up to 70- 80 meters from their bases. Operating at such heights carries various risks and hazards that could harm people and damage properties.

The hazards include equipment failure, overloading, crane tilting or misbalancing, falling loads, human errors, and many others.

Crane Hazards:

Equipment failure

Equipment failure or malfunction can result from mechanical failure, poor maintenance, poor planning, or operating equipment outside of its safe limits or intended lifting design.

Overloading

Overloading the equipment beyond its intended capacity is especially dangerous at high elevations and in windy conditions. As the elevation of the load increases, the control over the load diminishes, causing failures in the lever's hydraulics, wires snapping, and equipment tipping, tilting, or collapsing.

Falling loads

On average, a crane can lift anywhere from 10,000 to 60,000 tons. The result of these loads falling is devastating and could result in mechanical failure, load destruction, and injuries.

Poor lift planning

Poor lift plan by either using the equipment outside of their designed lifting methods or using multiple cranes without a pre-set plan to avoid congestion and overlapping. Operating with electrical equipment could impose the risk of electrocutions when the crane boom or cable accidentally contacts a power line.



Operating in dangerous Conditions and locations

High wind, cliffs, landslide, poor soil conditions, slopes and storms are all hazards.

Natural and environmental hazards pose a huge risk to the lifting operation as storms and poor condition affect the stability of the crane and compromise lifting operation.



Human error

Human operators and spotters either equipment based or ground based operate the crane. As a result, a margin of human error exists that could be a result of miscommunication, lack of training, or lack of coordination.

Controlling the Hazard

Lifting activities should be well planned, managed, and executed within the safe equipment limits; to mitigate the hazards, minimize the loss exposure, and reduce the risks that could result in property damage, human injuries, and death.

Hazard mitigation procedures

Proper crane safety techniques practiced by crane operators, maintenance personnel, and other employees continue to be of critical importance in minimizing the number of accidents. The proper operation of the crane should be practiced no matter how frequently the crane is used.

Through suitable measures, the risk could be mitigated.


Human Element

- ♥ Inspecting all cranes and appliances such as gears and brakes by a responsible party to be deemed ready for operation.
- ♥ The wind and storm condition should be monitored before operation, and all safety measures should be considered.

- ♥ Overloading the equipment beyond its lifting capacity must be prohibited.
- ♥ All personnel should be trained accordingly in order to limit or avoid injuries, accidents, and deaths. additionally, health checks must be completed for the riggers and operators to start the lifting process.
- ♥ Cranes' working areas must be barricaded by means of warning tape, etc., and must not be accessible by unnecessary personals.
- ♥ Visual or audible communication must be established between the crane operator and the banks man.
- ♥ Soil and ground conditions should be checked and controlled accordingly in order to avoid soil failure that would result in equipment overturning or sliding.
- ♥ An anti-collision system must be incorporated for tower cranes if they are to be operated in proximity to each other.
- ♥ All personnel on site should be wearing personal protective equipment (PPE). such as helmets, safety shoes, safety belts, and reflective vests.

Physical Element

- ♥ Safe Load Indicator (SLI) must be operational on mobile cranes and Limit switches must be properly set for tower cranes. Additionally, all cranes must be equipped with safety measuring tools, such as wind emergency stops, levelling alarms, weight alarms, etc.
- ♥ Cranes should be earthed in order to avoid electrical discharge and electrocutions that harm equipment and personnel.

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- ♥ All lifting gears should be examined and tested and a lifting permit should be obtained before operating.
 - ♥ Proper illumination should be utilized at night and tower cranes should have proper signaling lights for aircraft and other operating cranes.

Reference

For additional information, refer to ISO 45001:2018 Occupational health and safety management systems.

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