
		<h2>Vedanta Safety Standard</h2>	
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<p>The management acknowledges the contribution of the following individuals for being a part of ‘Cranes & Lifting committee’ and for their assistance in preparing this standard:</p>			
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Revision No.	Revision Date	Author	Change Description
R1	26-07-2022	Cranes & Lifting committee	Requirement specific to EOT Crane and Mobile Cranes bifurcated, training and competency requirements updated, EOT crane allowed lifting up to 100% of SWL, Critical Lifts definition updated, lifting plan requirements updated, Crane maximum permissible age defined, Load testing requirements specified.

VSS7 CRANES AND LIFTING SAFETY PERFORMANCE STANDARD

1. Scope

This standard is applicable to all business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, post closure management.

- 1.1. This standard applies to personnel and equipment involved in lifting operations using mobile or fixed cranes. The standard does not apply to hoisting operations in underground mines.
- 1.2. Businesses are necessarily required to comply with local crane and lifting-related laws and regulations.

Note: -

- **EOT Crane** = Electric Overhead Traveling Crane
- **Non-EOT Crane** = Mobile Cranes, Tower & Jib Cranes.
- **Vedanta Authorized Agencies** = For authorization of any training agency, approval should be taken from Cranes & Lifting Core Committee.

2. People

- 2.1. Any person designing or approving a lifting plan must be trained and certified as competent through a Vedanta authorized agency once in every three years and shall undergo internal refresher training and internal re-authorization through written assessment annually.
- 2.2. Mobile crane operators shall have a minimum experience of 5 years in crane operation with at least 1 year experience in operating similar crane. Operator skill and knowledge to be given due consideration.
- 2.3. Mobile crane operators must be trained and certified for specific crane operations once in every three years, ideally by OEMs or OEM authorized agency or Vedanta authorized agencies. Internal refresher training and internal re-authorization through written assessment should be done annually.
- 2.4. Rigger and signalman must be trained and certified once in every 3 years by Vedanta authorized agencies. Internal refresher training and internal re-authorization through written assessment should be done annually.
- 2.5. Fixed cranes (Jib Cranes, Tower Cranes, EOT Cranes etc.) operators shall undergo Crane specific training and certification by OEM or OEM authorized agencies or Vedanta authorized agencies or experienced operators (authorized as trainers through site specific approved framework) once in every three years. Internal refresher training and internal re-authorization through written assessment should be done annually.
- 2.6. All crane operators must undergo annual medical examination including but not limited to vision and

color blindness. Wherever applicable Work at height authorization and practice to be followed.

3. Process

Requirements specific to EOT Cranes:

- 3.1. EOT cranes must be fitted with audible travel alarms or an equivalent warning device, Load indicators (for all capacities above 5T), overload protection, hand operated dead-man switches for LT, CT & hoisting operations, anti-collision device for multiple cranes installed on same bay, two level interlocks for upper and minimum one interlock for lower limits, speed reduction and stop at bay ends. Interlocks to be routed through separate contactors. At the end of travel, physical stoppers must be installed.

Requirements specific to Mobile Cranes:

- 3.2. Mobile cranes shall be fitted with audible alarms (swivel operations, warning, and faults), Safe Load Indicator / Load Moment Indicator (for all capacities), anemometer (for all mobile cranes except pick and carry cranes), anti-two block device, OEM load chart.
- 3.3. Mobile cranes used at Vedanta site should not be more than 10 years old at any given time and fitness as per statute or competent third party is mandatory for selection.

Common requirements for Mobile & Fixed Cranes:

- 3.4. Self-declaration against mandatory requirements to be provided by vendor before mobilization. All points to be checked and confirmed by Vedanta representative before site entry.
- 3.5. The selected crane must have valid visual inspection; NDT (MPT/UT) inspection for hook assembly; a load test certificate signed by a competent authority of the respective state government/regulator; and recertification if the crane configuration is changed. Load test shall be done at minimum 100% of rated load at particular crane configuration in presence of competent person with valid risk assessment and shall comply to local statute requirements. The crane must have all major modification / accident history available when entering the business and issue copies to the Vedanta authorized person. If a crane is derated, load testing to be done once in every six months.
- 3.6. All rigging hardware must have valid certificates from competent person certified by state government/regulator, and there must be periodic internal inspection by user. Tests must be done annually or as prescribed by statute or as per risk assessment and as per test parameters mentioned in certificate.
- 3.7. A register of cranes and lifting equipment must be

- established that records all maintenance history including spares which will begin once the crane has mobilized on site. These records are to be maintained by the business.
- 3.8. Assembly and dismantling of cranes shall be as per OEM guidelines, SOP / Risk assessment for the same shall be ensured.
 - 3.9. There must be a documented procedure which requires a pre-operational check for safety interlock functioning, rigging equipment and connections, load within limits and other safety devices.
 - 3.10. All cranes shall have adequate fire extinguishing provision for First Aid Fire Fighting. A rescue plan should be developed for Cabin operated EOTs & Tower Cranes.
 - 3.11. **Critical Lift (Applicable for Mobile Cranes ONLY):** Any Lift greater than 75% of safe working load (SWL) and /or tandem lifts and/or lifts over operating facilities and/or lifts beneath power lines or live pipelines and/or blind lifts and/or lifts involving personnel cages and/or lifts identified as critical as per risk assessment should be considered as Critical Lift.
 - 3.12. All Critical Lifts require a risk assessment, a lift plan approved by a competent person and shall be supervised by Site / Area lifting champion. Lift plan should have lift data (equipment weight, rigging weight, gross weight, lift height, surface area, center of gravity), equipment data (manufacturer, model, boom length, jib length, material size), rigging data (rigging tools data, configuration, capacity, TPI). All stakeholders (riggers, operators, supervisor) shall be involved in lift plan preparation.
 - 3.13. For EOT cranes, Lift plan is required for all non-routine lifting activity and risk assessment and rigging methodology are required for routine lifting activity.
 - 3.14. Lifting is NOT PERMITTED above 90% of SWL for Non-EOT cranes, for EOT cranes lifting is NOT PERMITTED above 100% of SWL (Not applicable for load tests).
 - 3.15. Job clearance to be ensured for all mobile crane activities. Checks shall cover all aspects related to Crane fitness, operator competency, Area preparedness and job risk assessment. For mobile crane use post sundown, approval from dept head to be ensured.
 - 3.16. Critical lifts at night require that emergency response personnel should always be available during the lifts.
 - 3.17. Lifting must not be done when cranes are exposed to winds more than 32 KMPH speed.
 - 3.18. Pick and Carry using mobile crane must be avoided as much as possible. In case required, 'pick and carry' operation must undergo a specific risk assessment considering area of work, OEM guidelines and critical points like ground compaction and levelling, tyre pressure, load dynamics and marching path. Load should not be lifted more than 12 inches from the ground during movement. Pick and carry operation shall be limited to 50 meters.
 - 3.19. A pre-lift meeting with all members of the lifting team must be conducted.
 - 3.20. A dry run should be conducted prior to the lift.
 - 3.21. Hand signals or two-way radio shall be used for communication during crane operations and shall be mentioned in Lift plan.
 - 3.22. Loads must never be moved over people or occupied structures.
 - 3.23. Crane operator must always use seat belts.
 - 3.24. Tag lines must be attached on both sides of suspended loads which may require steadying / guidance.
 - 3.25. Proper rigging should be planned to ensure that loads to be lifted are secured and balanced.
 - 3.26. All crane hooks shall be provided with hook latches. In case of molten metal handling in open ladles and for grab hooks use, site must carry out risk assessment and give exemptions with alternate control measures.
 - 3.27. All crane sensors for Safety interlocks should be checked quarterly for correctness and calibrated wherever required by OEM / authorized representative. Load cell and anemometer must be calibrated annually by OEM or competent person.
 - 3.28. The OEM lifting chart shall always be used and there shall be no interpolation between the chart listings.
 - 3.29. Signages shall be provided over that Cranes that are not in use for longer duration and hooks of the cranes must be either removed or rested. EOTs in this case to be electrically isolated.
 - 3.30. Crane operator shall not leave the operator cabin or controls while load is suspended.
 - 3.31. Man-basket (rigged to crane / chain pulley / hoist hook) usage to be avoided as much as possible, in unavoidable cases, lift using Man-basket to be considered as critical lift. Man-basket shall be designed, tested & certified by competent person / agency.
- #### 4. Review
- 4.1. All documentation including recorded crane data is to be preserved.
 - 4.2. Quarterly review of standard compliance by Site Senior Management.
 - 4.3. Annual audit by corporate.



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