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|  | WORK INSTRUCTION: | Hoisting work | Rev. 01 |
| | HSEQ procedure: | Normal business operations | Date: 27-02-13 |

1. General

Objective

Hoisting activities are high-risk because the load can fall and there is a risk of crushing due to the inertia of the load. Consequently, hoisting activities may only be carried out subject to certain conditions.

The objective of this procedure is to identify the conditions according to which hoisting activities may take place in order to prevent incidents or material damage.

Applicability

This procedure applies to employees of REC and third parties who perform hoisting work for REC. The hoisting activities may be performed using a mobile crane, truck-mounted loading crane or overhead crane, or with a device that has been designed for hoisting tasks.

Definition/Term

Description

Hoisting

Moving freely suspended loads vertically and horizontally; with a crane for example.

Lifting


Moving supported loads vertically and horizontally; for example, with a lifting fork attachment mounted to a forklift truck, reach truck or hydraulic shovel.

2. Safety hazards

The following hazards must be considered when carrying out hoisting work:


- Risk of crushing and pinching under a falling load and when hoisting above buildings
- Risk of pinching limbs between the load, load attachment cable, hoisting accessories, or the load and objects in the surrounding area
- Falling from an elevated height when guiding a load, working on a load or working in a man-riding basket
- Stored energy in the form of, or released by, breaking cables, hoisting accessories, a falling load and a swinging load
- Subsidence of the crane, which may cause the crane to tilt, making the load swing uncontrollably or detach from the hoisting equipment

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- Incidents and damage caused by poor communication (language problems, interference, hand and arm signals)
- Electrical discharge when working close to live electricity cables
- Risk of falling, risk of crushing and pinching when erecting and dismantling a mobile or modular crane
- No environmental risks

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3. Health hazards

- Exposure to dust and airborne particles (including micro-organisms)
- Vapours and gases
- Exposure to heat
- Hearing damage

4. Working method

The section below describes the procedure for carrying out the activities:

- preparation for hoisting work (4.1)
- hoisting work with mobile cranes (4.2)
- anticipating weather conditions (4.3)
- testing, inspection and safety devices (4.4)
- using hoisting equipment (4.5)
- training (4.6)
- use of fall protection (4.7)
- cordoning off the hoisting area (4.8)
- communication (4.9)

4.1 Preparation for hoisting work


Based on the decision tree in “Chapter 10, Hoisting plan decision tree”, the requesting party or work planner determines whether a hoisting plan needs to be drawn up. The hoisting plan and the TRA are drawn up by, or on behalf of, the requesting party and “Chapter 11, Points to consider in the hoisting plan” is used as a guideline when doing so. The HSEQ department can provide advice when drawing up the hoisting plan. The hoisting plan must be approved by the hoisting company, the relevant manager and the HSEQ department. This also applies if the hoisting work changes relative to the hoisting plan. Hoisting work that is to take place close to (within 5 metres of an electrically live component) or above electrical systems must also be approved by the person responsible for electrical safety.

The work planner may produce a drawing of the site that indicates dimensions and the presence of pipes and cables.

If applicable, the checkboxes for the hoisting plan and TRA are checked on the work permit*. The hoisting plan and the TRA are stored by the requesting party in the following location; Y drive/KAVM/Veiligheid/TRA, so that they can be referenced by all employees.

The type of crane is chosen based on consultation between the requesting party and the contact at the hoisting company, as identified in the hoisting plan. Hoisting plans are submitted by the requesting party

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to the installation manager at least one week before commencement of the hoisting work. A simple hoisting plan is submitted by the requesting party to the installation manager at least one day before commencement of the work. The installation manager checks the hoisting plan for possible conflicts with other activities or with the site operating conditions. The requesting party (or representative of the requesting party) explicitly calls attention to the hoisting work during the morning meeting on the relevant hoisting day.

4.2 Hoisting work with mobile cranes

4.2.1 Site access

Before accessing the site, the crane operator reports in at the weighbridge. The weighbridge operator runs through the access procedures such as checking VCA certification and displaying the instruction film for visitors. The weighbridge operator also calls the designated contact at REC.

4.2.2 Carrying out hoisting work

After the crane has been admitted to site, the requesting party assigns a route and set-up position to the crane operator. The requesting party, together with the crane driver or job owner, receives the work permit and associated documents from the relevant manager (possible hoisting plan, TRA, LMRA checklist for hoisting work, etc).

The requesting party discusses the work with the crane driver and job owner in a pre-work meeting.

After setting up the crane and at the start of the working day (in the case of multiple hoisting days), the requesting party, job owner and crane operator fill out the LMRA checklist for hoisting work. The checklist is handed in at the end of the day together with the work permit.

When attaching the load and performing hoisting work, the requesting party is present at the work site (in order to supervise).

The crane operator is fully responsible during actual hoisting and use of the crane. When hoisting a load with multiple cranes, the hoisting company foreman is fully responsible for the hoisting activities. The job owner is responsible for the activities described on the work permit. The job owner reports any deviations to the requesting party.


If the work is carried out within the context of a specific project, the above applies insofar as commensurate.

If required by the type of load, rigging lines will be used in order to control the load. Rigging lines should not be used to move a load horizontally and may only be used to guide the load's path.

4.2.3 Completion of the work

After completion of the hoisting activities, the job owner reports to the requesting party, who checks whether the work has been performed correctly and inspects the surrounding area for possible damage. The job owner submits the work permit to the relevant manager.

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4.3 Weather conditions

The hoisting work may not be carried out if exposure to wind leads to dangerous stability problems or makes it impossible to control the load. No hoisting work may be carried out above 7 Beaufort (13.8 m/s) and in conditions of heavy wind gusts. If indicated by the hoisting table for the crane, a lower maximum wind force may apply, subject to the crane operator's judgement.

Hoisting activities must be discontinued immediately if stormy weather is imminent. The requesting party, job owner and crane operator are all responsible for this decision. If possible, the crane operator covers over the crane or lowers the mast, subject to the crane operator's judgement.

4.4 Testing, inspection and safety devices

4.4.1 Inspecting and testing hoisting and lifting equipment

Hoisting activities may only be carried out using demonstrably approved hoisting and lifting equipment. The hoisting and lifting equipment must be marked with the maximum working load, an identification code and the date of inspection and testing.

Hoisting equipment and hoisting accessories must be inspected annually by an expert or by a certification body. An annual or four yearly inspection and test procedure must be carried out in some cases. The legally required inspection and test periods for REC hoisting equipment are monitored by the Reliability Engineer at REC. The work planner in the technical department monitors the above in the case of lifting tooling for wheeled equipment.


Before starting any hoisting task, the user must visually inspect the hoisting accessories for signs of faults. If in doubt, the hoisting accessories may not be used and must be submitted for re-testing or disposed of.

4.4.2 Inspecting/testing cranes

Only inspected and tested cranes may be used on site. The inspections that have been carried out and the test dates must be recorded in the crane logbook. This also applies to multifunctional machines used for hoisting work, such as pile drivers and/or earthmoving machinery. The crane logbook must be available for inspection at the work site. For details of legislation relating to inspecting, certifying and testing equipment (including cranes) please refer to article 7.4 a of the Dutch Working Conditions Decree (Arbodesluit).

Overhead cranes and hoisting beams must be marked with a valid inspection and test date. The associated crane logbooks and test and inspection reports are kept on file by the Operations department.

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4.4.3 Safety devices

Hoisting tools and cranes must be equipped with a maximum load moment safety device. Users may not disable a load moment safety device and/or a hoist a heavier load than that indicated on the hoisting tooling or in the approved hoisting table for the crane.

4.4.4 Load-spreading plates

The support struts for mobile cranes and modular cranes must always bear on load-spreading plates. The extended length of the support struts corresponds to the values indicated as applicable for the hoisting load in the hoisting tables for the crane. Depending on the ground load, an additional bed of crushed rubble (repack) or Azobe hardwood load-spreaders must be used.

4.5 Use of and attachment of hoisting and lifting equipment

The crane operator, crane driver or user of the hoisting equipment is responsible for ensuring use of the right equipment. In most cases, this is determined by the size and composition of the hoisting load. The equipment must be suitable for the load that is to be moved.

Man-riding baskets

Transporting people in suspended man-riding baskets in combination with a (mobile) crane and/or forklift truck must be carried out in accordance with Dutch Working Conditions Policy Rule, article 7.23d (Arbobeleidsregel artikel 7.23d) and the Working Conditions catalogue (Arbocatalogus) published by the Dutch Vertical Transport Association (Vereniging Verticaal Transport). Before using a man-riding basket, the crane operator and the user fill out the checklist entitled “Werkbak hangende aan een mobiele kraan” (man-riding basket suspended from a mobile crane). This checklist is supplied by the hoisting company.

4.6 Training


4.6.1 Mobile crane

Mobile crane operators must be in possession of a TCVT certificate in their name that has been issued by the Dutch foundation for supervision of certification for vertical transport (Stichting Toezicht Certificatie Verticaal Transport or TCVT) and is valid for the hoisting equipment in question. The required experience and training are described in the TCPR booklet that the crane operator must be able to display.

4.6.2 Truck-mounted loading crane

When loading and unloading consignments on a truck and hoisting loads with a load moment of less than 10 tonnes/metre, the operator must be appropriately trained and possess a certificate of proficiency in using the equipment. When hoisting loads with a load moment of more than 10 tonnes/metre, the operator must be in possession of a TCVT “TruckAutolaadkraan” certificate for truck-mounted loading cranes in his name.

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4.6.3 Overhead crane and multifunctional machine with hoisting capability

When carrying out hoisting work, the person operating the overhead crane or machine must have been trained appropriately and be in possession of a certificate of proficiency for the machine in question. The employee must keep a copy of this valid hoisting certificate on his person or have submitted it to the technical department work planner (werkvoorbereider TD).

4.6.4 Guiding and attaching loads

People who attach loads must be trained appropriately and must be in possession of a suitable certificate of proficiency such as the certificate for the “Verplaatsen van lasten” (Moving Loads) training course in the VCA training course guide published by SSVV. Hoisting spotters/riggers must be in possession of a Hijsbegeleider TCVT certificate (TCVT Hoisting Spotter) in their name, issued by the Dutch foundation for the supervision of certification in vertical transport (Stichting Toezicht Certificatie Verticaal Transport or TCVT).

4.7 Fall arrester

If there is a danger of falling during hoisting work, for example because guard rails have been removed, all people within 2 metres of the danger area must attach fall arrester safety lines. See procedure “33.51P Werken op hoogte” (Working at elevated height).

4.8 Cordoning off the hoisting area

Hoisting area around the crane


The hoisting area is cordoned off by the job owner or crane operator using red/white ribbon or chains, or continuous fencing. Only under exceptional circumstances, i.e. when no people other than those performing the work are present in the area where work takes place (for example hoisting in an open field or on a loading platform) may the requirement for cordoning-off be ignored, subject to the condition that hoisting takes place under the supervision of a clearly identifiable person who can warn and restrain possible passers-by. If the hoisting work affects vehicle movements on the site in any way, consideration must be given to diversion routes or extra signposting.

In principle, if a load is hoisted over buildings that are (or may be) occupied, the section of the building that might suffer an impact when hoisting the load should be evacuated. The decision to evacuate or not depends on the size of the load and the structural design of the building. The reason for not evacuating the building is documented in the TRA and must be approved by the HSEQ department and the job owner.

Hoisting area for overhead cranes

The area under the hoisting opening must be cordoned off during hoisting by the overhead crane operator. A solid barrier should preferably be used in order to prevent employees from entering the area under the load. When hoisting in a warehouse or workshop, the hoisting area does not need to be cordoned off as long as the load is moved at walking pace and no persons who are not involved in the hoisting work are present within 5 metres of the load.

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4.9 Communication

When coordinating the hoisting work, instructions are given to the crane operator by a single person. This communication may take place using walkie-talkies or via hand and arm signals. If the spotter and the crane operator cannot see each other, communication takes place using walkie-talkies.

When using a man-riding basket, the crane operator communicates with the employees in the basket via walkie-talkie.

When multiple cranes are used to hoist the same load, or mobile elevating work platforms are involved in the hoisting activities, communication takes place via walkie-talkie between the crane operators and the spotter coordinating the hoisting work. The walkie-talkies must be set to the same channel and correct operation tested beforehand.


5. Mandatory PPE

- Safety footwear
- Safety helmet
- Work clothing (possibly worn under a white disposable overall fitted with a hood)
- Work gloves
- Ear protectors when the equipment is in operation

6. Situation-related PPE

- Half-face or full-face mask with a P3 filter cartridge
- Full-face mask with a blower respirator unit equipped with P3 filter cartridges
- Dust goggles (when using a nose/mouth respirator or half-face mask)

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7. Hygiene

- Clean the safety footwear if required
- Clean tools/accessories that have been used
- Take a shower and dress in clean (work) clothing

8. Relevant legislation and regulations


- Arboregeling (Dutch Working Conditions Regulation), Chapter 7 (Work resources)
- Arboregeling (Dutch Working Conditions Regulation), article 8.26 (hand and arm signals)
- Arbobesluit (Dutch Working Conditions Decree), Chapter 7 (Work resources and specific activities): section 2, 4 and 5.
- Arboregeling (Dutch Working Conditions Regulation), article 7.6 (training for hoisting work)
- Arbo-Informatieblad 17 (Dutch Working Conditions Information Sheet 17) “Hoisting and Lifting tools and equipment”
- Arbocatalogus (Dutch Working Conditions Catalogue) published by the Dutch Vertical Transport Association (Vereniging Verticaal Transport)

9. Points to consider in the hoisting plan

The points below may be included in the hoisting plan if they are considered to be a critical factor during the hoisting work. They can be used at all events as a checklist for preparing for hoisting work.


- Load:
 - weight, dimensions and centre of gravity of the loads that need to be moved
 - hoisting provisions on the load
 - attachment/release instructions relating to the load
 - the prescribed hoisting method for the load (indicated by the manufacturer or structural designer)
 - the place where the load is to be attached, the path of the load and the place where the load is to be set down
 - the height above ground level of the positions where the loads are to be set down
 - the method used to transport the load to and from the attachment and set-down locations

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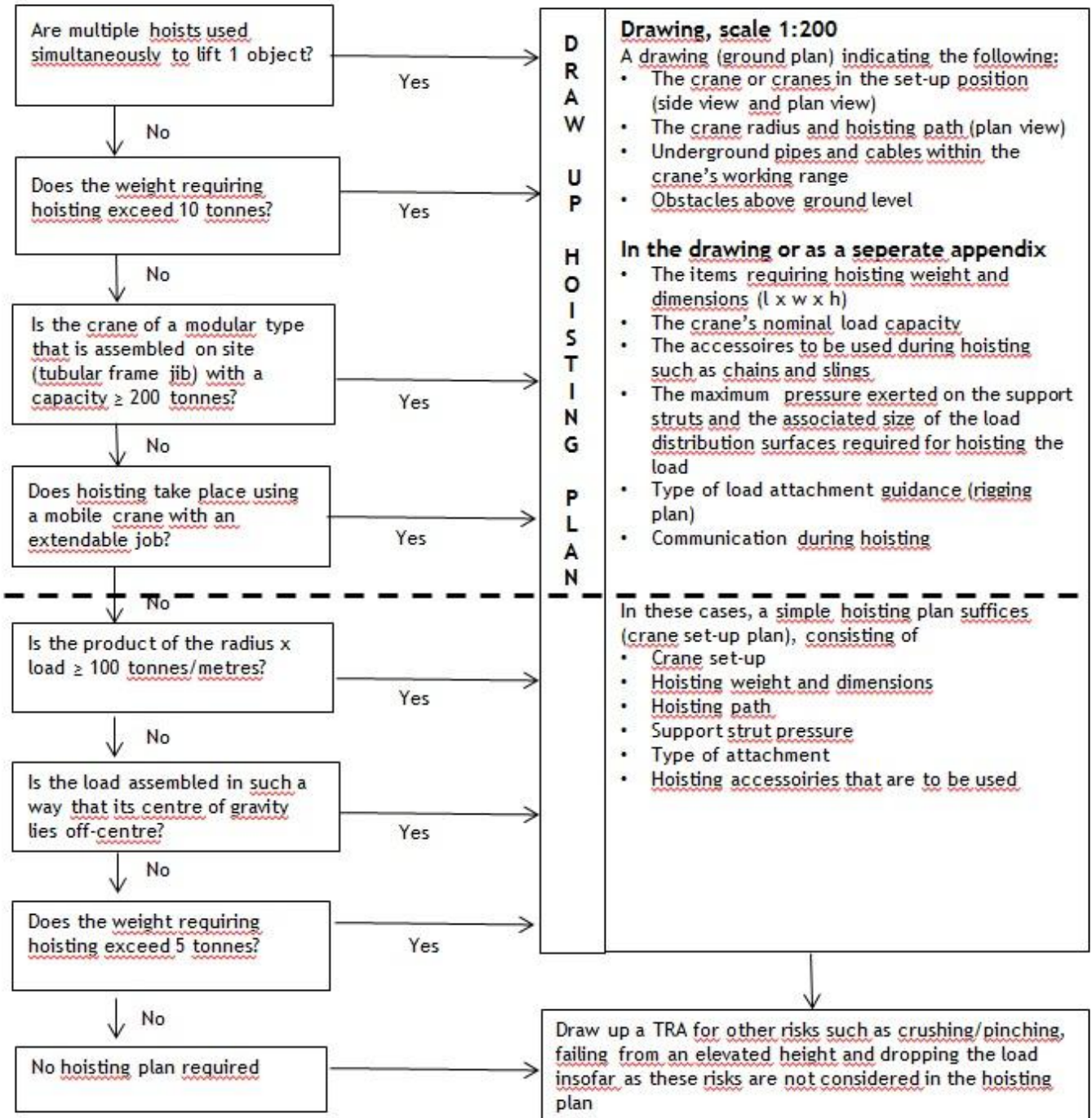
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- Hoisting and lifting tools and equipment:
 - the hoisting or lifting provisions on the load
 - any special hoisting and lifting equipment that is required, such as balance bars, holders, etc.
 - length of rigging lines and tackles
 - use of a man-riding basket
 - use of fall arresters (when attaching/releasing hoisting provisions)
- Crane
 - configuration of the crane that is to be used (type)
 - hoisting capacity
 - swivel range
 - load-bearing support plates/ground pressures
 - the position where the machine can or must be set up (the right load-bearing supports)
 - use of multiple cranes (also applies for combinations of a mobile crane and overhead crane)
- Environment factors:
 - permissible ground pressure (loose or compacted earth, pits, cables and pipes in the ground)
 - the presence of high-voltage power lines and transformer stations within the working and turning area
 - obstacles that may impede the load path or limit the crane's range or function,
 - vulnerable objects under the path of the load (buildings, cables/pipes)
 - metallised surface on which the machine or heavy or unusual loads are to be transported and set up
 - wind speeds (wind force exerted on the load, turbulence close to buildings)
 - barriers on the public road
 - ribbon or chain barriers/fencing around the hoisting area
 - communication facilities for the crane operator and hoisting spotter

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10. Decision tree for drawing up a hoisting plan



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