Lifting and hoisting activities

Scope: RWE Generation NL

Department: Health & Safety GES-NL

Valid until: 01-07-2023

Document information

Version	Version date	Authorisation
V 2.1	07-08-2020	Health, Safety and Security Manager – R. Kamst

Revisions compared to previous version

- Hyperlinks to checklists changed due to Doc2E revisions

Purpose of instruction

The uniform utilisation of hoists and hoisting gear in accordance with the prescribed measures so that the risks during vertical transport are controlled.

Related processes

Process	Title	Code
Output	Controlling HSE risks	P053
Input	Operation and Monitoring	P033
Input	Maintaining installations	P080

Target group

All employees involved in the planning or provision of vertical transport.

Scope

The instruction applies to all RWE Generation NL sites.

Safety, health & environment

Hazard
Danger of crushing and entrapment due to falling hoisting load, danger of entrapment of limbs between hoist load, hoisting gear and surrounding objects. Tilting, tipping over of crane in case of unstable surface with no load bearing capacity. Falling load due to faulty, untested hoisting gear. Hitting objects in the vicinity, voltage flashover when installed in the vicinity of live parts (e.g. HV power lines).

Warning
Hoisting operations fall into the category of increased-risk work, so a Task Risk Analysis (TRA) must always be carried out. Permission from the site manager is required for positioning mobile cranes. Before hoisting or lifting, always check the hoisting gear for defects and whether it is still subject to a valid inspection.

Life saving rules

General

- Lifting equipment may only be operated by qualified and authorised staff.
- The operator is ultimately responsible for working safely with a hoist or lifting machine and the hoisting job.
- Always be alert to underground pipes and cellars, also for the temporary positioning of heavy loads. When setting up or driving on a gravel bed, the use of steel planking is mandatory.
- Check all hoisting and lifting gear before starting work. Certificates must be present.
- For all mobile hoists that can be strutted, strutting on stabiliser plates is mandatory. The permissible earth pressure must be determined by the **site terrain manager**. The guideline for disturbed soil on our sites is that the maximum earth pressure must never exceed 200 kN/m^2 (2 kg/cm^2 or 20 $tonnes/m^2$).
- Good communication between the operator and the hoisting assistants/riggers is necessary.

Working method

Hoisting work must never commence before a valid permit to work has been issued, and instruction **I001 Permits to work** must be followed. Exceptions are the use of an overhead crane in a workshop and stationary unloading cranes for fuel and residual materials transport.

The performance of hoisting work with mobile hoists always falls into the category of increased-risk work. A TRA must therefore always be drawn up prior to the performance of this work, in accordance with Instruction **I002- Performing Task Risk Analysis**.

Before starting work, staff should ask themselves who is responsible for the performance of the hoisting operations. There is a clear distinction between work on a cost-plus basis and contracted work.

Contracted work means that the supplier accepts a job for which it supplies a crane and an operator. The supplier gives orders directly to the operator and is responsible for a safe job order and instruction and a safe working environment. The supplier draws up a hoisting plan and discusses it with the operator prior to hoisting.

The client and the supplier of the operator share responsibility for creating a safe working environment for the operator. The supplier provides a technically safe, recently approved crane with hoisting gear and guarantees the operator's expertise.

Work on a cost-plus basis means that the supplier lends its operator (possibly with a crane) to a client. The client gives orders directly to the employee. The operator is a hired employee.

The hiring client is responsible for a safe job order and instruction (possibly consisting of a hoisting plan). The client is responsible for creating a safe working environment, and the supplier for a technical, safe recently approved crane with hoisting gear and guarantees the operator's expertise. The client can also provide a crane (overhead crane, gantry crane) and hire an operator.

If the operator is faced with an unsafe work situation, they will report this to the client's construction manager. Together they will look for a solution. If the work situation remains unsafe, the operator will directly contact their employer. The operator's employer will consult with the client. In this regard, there is no difference between contracted work and work on a cost-plus basis.

Before – and, if necessary, during – hoisting operations, the operator, the manager on the site and the involved workers will have to consult on planning and safe execution.

When the machine arrives at the site, it is important that the workplace is easily accessible and that the access route is suitable for the heavy load. The machines are based on balance and therefore need to carry a great deal of ballast, resulting in a high load on the road. To this end, the load bearing capacity of the surface must be known, taking into account the expected tyre or track pressure. The earth pressure is determined by several factors, including the type of soil, the moisture content and whether the soil has been disturbed. The presence of underground pipes is very important and must be known in advance.

On account of the above, the hoisting operations at RWE locations must be discussed with the **Site terrain manager** of the location in advance and must have their approval regarding installation, in connection with the permitted earth pressure, presence of cables, pipes, cellars, etc.

Upon arrival on the day of work, the operator of the (mobile) hoist reports to the gate/Security department. They will alert the RWE contact/permit holder.

The contact/permit holder checks together with the crane operator in a safe environment (preferably outside the gate) whether the crane book, the certificates of the hoisting gear and the crane operator's certificates are present and valid (see **RWE mobile hoists checklist**) and

whether a hoisting plan has been drawn up for the hoisting job in question. If the documentation is not valid and complete, Security cannot admit the crane to the site. The **contact** and the **crane operator** are responsible for this and can demonstrate this with the above documents and the checklist.

A foreign operator must also be in possession of a valid Dutch **TCVT certificate** for the hoisting or lifting machine in question.

Tasks and responsibilities of the client (RWE)
For the hoisting or lifting operations to be performed as efficiently and safely as possible, at least the following information must be provided by the **client**:

a) The mass of the loads to be moved;
b) The shape and maximum dimensions of the loads;
c) Site plan showing the distances between the locations where the loads are to be attached, the locations where the loads are to be positioned and the location where the machine can or must be set up (with proper strutting);
d) The height above ground level where the loads are to be positioned;
e) Ambient factors which could meet the load on its way, or which could limit the reach or function of the crane;
f) The presence of high-voltage power lines or installations within the working and rotating range (for information and approval, please consult the RWE **E-installation manager**);
g) The hoisting methods prescribed by the supplier of the load or object (in the context of the CE marking, this is an obligation of the supplier of machinery);
h) The presence of suitable hoisting and lifting gear in and on the load;
i) The types of hoisting or lifting tools, such as chains and clamps etc., that must be used to move the loads;
j) The possible necessity of special hoisting and lifting tools such as hoisting beams and clamps;
k) Site condition, surface on which the machinery is moved and operated, with an indication of the maximum permissible earth pressure at the hoisting location. This requires information and approval from the **Site terrain manager** at the RWE location;
l) The presence of third parties (in connection with cordoning off the work);
m) Details as to who takes care of the cordoning when setting up the crane and during hoisting operations (according to RWE **instruction I112 Barriers, marking and lines**) to prevent unauthorised persons from entering the work area;
n) The presence of a safe workplace at height (fall protection, etc);
o) In the case of an indoor set-up, information about the maximum floor load (consult the Maintenance site manager or local expert of the managing department (E&M) for information);

The **Client** must have designated a contact/permit holder for a hoisting job.

Additional tasks of the contractor

The **vertical transport operator (contractor)** must use a machine with a capacity and functionality geared to the work and data provided, as well as a qualified operator.

In order to work safely and efficiently, several tasks are important that must be arranged by the contractor:

- Completing the **RWE mobile crane checklist** together with the contact (see forms in Appendix 1);
- Drawing up a hoisting drawing and/or hoisting plan;
- Completing the checklist for the passenger hoisting cage if this is used (Appendix 2);

Furthermore, the contractor will ensure that:

- An **HSE work plan** is drawn up with a draft **Task Risk Analysis** (TRA);
- Crane operator and hoisting assistant/rigger speak the **same language**;
- Vests are provided and worn, green colour with "**Operator**" imprint and orange with "**Rigger**" imprint (see as an example Figure 1 below).

Figure 1 *Crane operator's and rigger's safety vests*

Before – and, if necessary, during – hoisting operations, the operator, the manager on the site and the involved workers will have to consult on planning and safe execution.

During the hoisting operations

- There must be no people under the load and unauthorised people are not allowed to enter the work area;
- The permitted operating load of the hoist must not be exceeded;
- Hoisting people along with the load is not permitted;
- The crane operator must always be present at the operating position as long as all the loads suspended from the crane are separate from the solid surface;
- If the weather conditions change (thunderstorms, strong winds, precipitation), stop work and consult the contact person or permit holder/issuer;
- During hoisting operations, only the hoisting assistant/rigger is permitted to give instructions to the operator.

Risky situations - Multiple cranes within each other's operating range

The effective measures to be taken to prevent collisions between cranes and/or loads:
- Prior to the operations, consultation takes place between the operators and arrangements are made and set down;
- Communication between operators must be arranged;
- Oversight by a qualified person must be arranged;
- Communication between operators and the qualified overseer must be arranged;
- A hoisting plan must have been made;
- The rotation range (if possible) of each crane is limited.

Risky situations - hoisting over buildings

When hoisting loads over buildings, the following specific measures must be taken:

A load can only be hoisted over a building if the following conditions are met:
- There are no people present;
- No dangerous work processes are taking place in the building;
- There are no dangerous installations in the building;
- The presence of persons in a building over which a load is being hoisted is prevented by evacuating the building or choosing a different time for the hoisting operations (e.g. after working hours). If this is not possible, hoisting can only take place if the following measures are taken:
    - Pay extra attention to the stability of the load.
    - Keep the time that the load is above the building to a minimum.
    - Keep the drop height of the load to a minimum.
    - If there is a risk that the roof structure is not strong enough to absorb a potential fall of the load and, as a consequence, the load may fall through the roof, either the roof will be temporarily reinforced, or the building will be evacuated.
    - Alert people in the building at the start and end of the work.

If hazardous work processes or hazardous installations are present in the building, the load must be moved in a different way.

Risky situations - hoisting in the vicinity of pylons, wind turbines and high-voltage connections

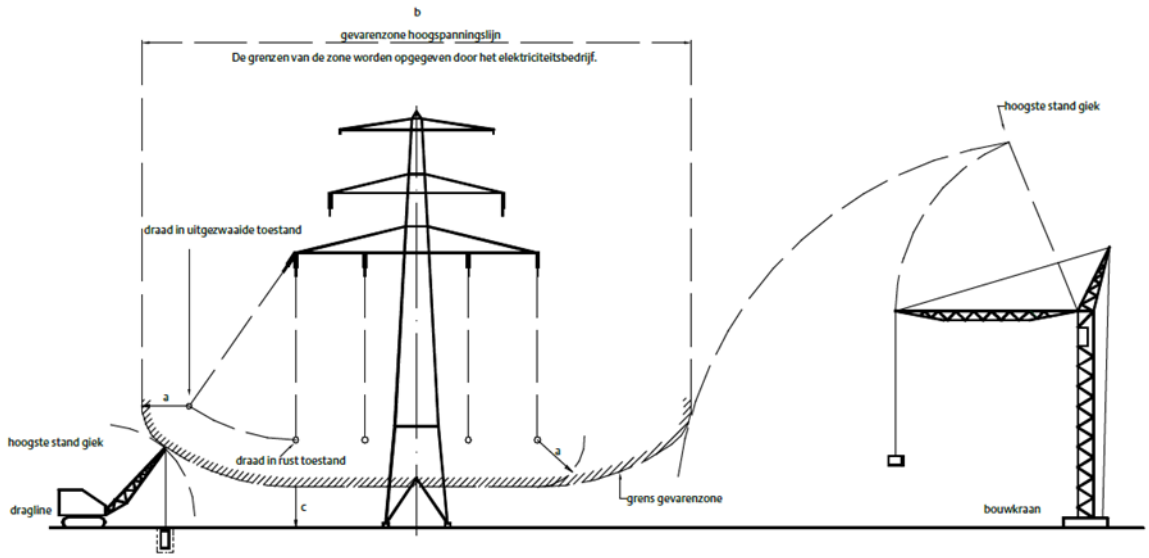
The following specific measures will be taken:

- In contact with the manager/expert, the danger zone is identified. The danger zone is the area where the presence of people and materials is not allowed;
- The danger zone is respected;
- Operations in the danger zone are carried out in consultation with the manager.

The following points of attention are taken into account:

- The load is not hoisted over the danger zone;
- Measures are taken to ensure that when the crane swings (boom is lowered, etc.), it will not end up in the danger zone;
- The crane is earthed according to the crane's operating instructions, or according to the instructions of RWE personnel. In some cases, earthing with an earthing pin will be required.

Hoisting operations in the vicinity of electrical equipment and high-voltage power lines must therefore be reported to the **RWE E-installation manager** in advance; moreover, certain minimum distances must be maintained (see Figure 2). Permission from this expert is required and they can determine whether the installation can be de-energized, which is preferable, or whether additional, specific measures need to be taken.



	380 kV	220 kV	150 kV	110 kV
a	6 m	5 m	4 m	3 m
b	min. 60 m	min. 50 m	min. 50 m	min. 50 m
c	zie toestemming	zie toestemming	zie toestemming	zie toestemming

Figure 2 zone and boundaries for HV power lines

Training requirements and certificates

A certificate is prescribed for the hoists listed below with an operating load moment greater than 10 tonne metres:

- Tower cranes
- Mobile cranes
- Mobile pile drivers

This group of hoists also includes multifunctional tools if they are used (and equipped) as cranes, for example, a truck-mounted crane, a telehandler, etc.

Minimum training requirements				
	Operator	**Rigger**	**Employee attaching loads**	**Employee moving loads**
Operation of mobile hoists	TCVT certificate (See also under **Operator qualifications**)	VVL	VVL	Demonstrable instruction received
Hall crane operation (indoors) **Load < 10 tonnes**	Demonstrable instruction received	Demonstrable instruction received	Demonstrable instruction received	Demonstrable instruction received
Hall crane operation (indoors) **Load > 10 tonnes**	VVL Demonstrable instruction received	VVL Demonstrable instruction received	VVL Demonstrable instruction received	Demonstrable instruction received

Operator qualifications

Operators who carry out hoisting work in the Netherlands on a construction site with an operating load moment of 10tm or more must be in possession of a **TCVT personal certificate** for the machine in question. Possession of the TCVT certificate ensures that only qualified operators are allowed to carry out (hoisting) work.

These are the following certificates:

- Mobile crane operator;
- Tower crane operator;
- Operator of truck-mounted crane with hoisting gear;
- Operator of earth-moving machine with hoisting gear;
- Mobile tower crane operator;
- Operator of telehandler with hoisting gear;

In addition to the statutory training, the specific instruction per crane is also important. The operator must be aware of the specific aspects of the crane they operate. These can be found in the operating instructions, which must be present on every crane. The final attainment levels of the crane operator training course indicate that a crane operator is automatically qualified to operate a forklift truck, aerial work platform or telehandler.

Terminology and abbreviations

Abbreviation/term	Definition
Client	The person who orders hoisting work. The client and the contractor may be the same person if the work is carried out on their own account.
Contractor	The person who performs the hoisting work (certified contractor or own employee) and hence receives all information (TOS) from the client. The contractor compiles the job package.
Site terrain manager	The site manager must be someone who has general knowledge of the site and the surrounding terrain. They must have knowledge of the underground structures and the permissible earth pressure. They are appointed to this end by the Location Manager.
Hall crane (overhead or gantry crane)	Stationary crane in workshops or production facilities for hoisting and moving loads.
Hoisting gear	Tools for attaching or hoisting loads.
Telehandler	A machine with which loads are moved. Use of the machine for hoisting operations is permitted if the machine is fitted with Load Moment Protection and operated according to the hoisting data of the telehandler. The hoisting block and telehandler must be matched to each other. If the load moment is greater than 10 tonne metres, the operator must be in possession of the Dutch TCVT certificate.
Forklift truck	A machine with which loads are moved. Use of the machine for hoisting operations is permitted if the machine is fitted with Load Moment Protection and operated according to the hoisting data of the forklift truck.
Earth-moving machine	Earth is moved with an earth-moving machine. It must not be used to hoist a load with a hoisting hook. If the machine is fitted with Load Moment Protection (LMB), the hoisting information of the earth-moving machine must be observed.
Rigger (hoisting assistant)	A rigger is deployed for simple hoisting work, as a crane operator's assistant for communication, as a crane operator's assistant for erecting a crane and for attaching loads.
Operator	An operator is the person who operates the crane. The crane operator is responsible for the actual hoisting work.
Hoisting drawing	A hoisting drawing specifies the tonnage, mast length, outreach, weight to be hoisted, strut pressures (in tonnes) and earth pressures under the plates (in tonnes/m2) of the crane.
Hoisting plan	A hoisting plan provides the data from a hoisting drawing, supplemented with a top and side view of the work location, the hoisting movement and a description of the measures to be taken
Outreach	The distance between the centre of the slewing unit and the centre of the load. For machines that are unable to swing, the centre between the front and rear tilt line of the machine and the load is taken.
VVL	Certificaat Veilig Verplaatsen van Lasten (Moving Loads Safely

VVT	Vereniging Verticaal Transport (Vertical Transport Association)
Workload	Workload means the maximum allowable effective load, which may be applied. This means that the workload is the maximum allowable mass of the effective load. The workload must be expressed in kilograms (kg) or tonnes (t). The workload is also referred to as operating load. "WLL" is also used to refer to the workload. WLL is an acronym that stands for Working Load Limit.
IM	E-Installation manager, often E-engineer, who is responsible for the E-installation of the location in question. The IM will examine internal rules as well as external rules of e.g. Tennet and set requirements for the hoisting job.
Accessibility	Accessibility means the ability to reach a place, to get there. That is, a mobile crane must be able to reach the area easily, so that the (residential) environment suffers the least inconvenience during the construction process.
TCVT	Toezicht Certificatie Verticaal Transport (Vertical Transport Certification Supervision)
Hoisting	Moving freely suspended loads vertically and horizontally, as with a crane.
Lifting	Moving guided loads vertically and horizontally, for example with a fork carriage on a forklift truck, telehandler or shovel.

Appendices

Appendix 1: F032-006 Mobile cranes checklist (Dutch)

Appendix 2: F032-005 Operator's checklist for use of passenger hoisting cage on mobile crane (Dutch)