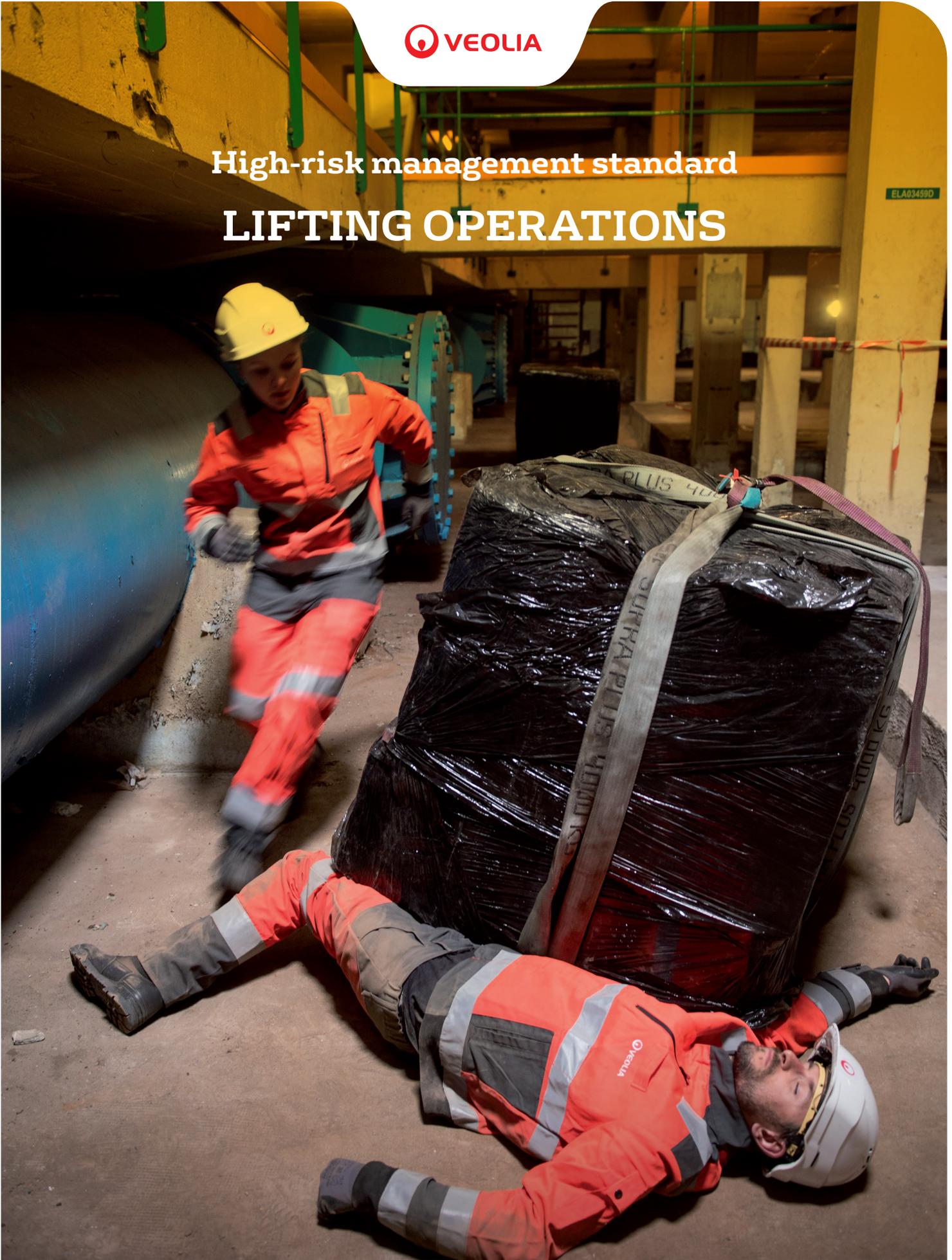




High-risk management standard

# LIFTING OPERATIONS

ELA03459D



alwa✓safe



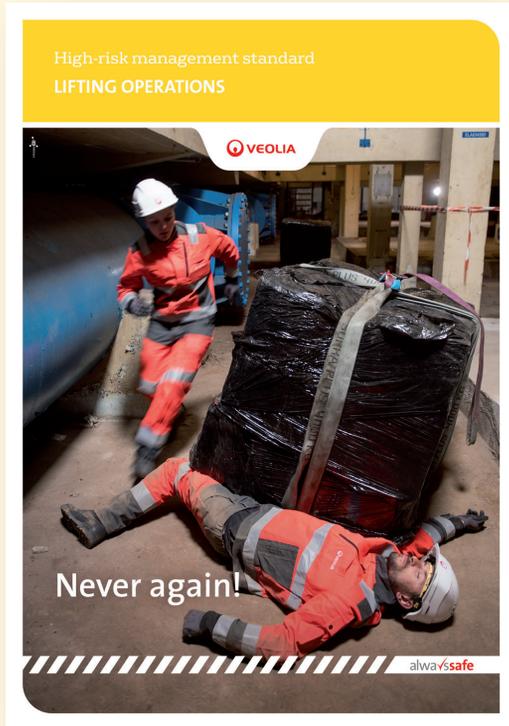


**L**ifting operations are inherent to Veolia's operations. They can be performed manually or by using lifting equipment. Both manual lifting and mechanical lifting operations can put workers at great risk of injury or health, causing sick leave or disability. When used properly, these lifting devices make operations easier and safer. This lifting operations standard applies to the inspection, use, and maintenance of fixed and portable overhead cranes and hoists used for material lifting on the property of Veolia and Veolia customer sites. It is vital for all site staff, in particular equipment operators, to understand and follow established safe protocols as directed in this written standard. Only trained and competent persons may perform activities related to hoists/cranes according to local regulation. This document explains roles, responsibilities and requirements for operating cranes and hoists.

**SCOPE:**

This document applies to all activities and sites of Veolia. Contractors of Veolia must also comply with this standard. It provides practical guidance for persons conducting a business or undertaking on how to manage the health & safety risks associated with lifting operations.





## > Summary

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## 1.0 > Definitions

**A lifting operation** is an operation concerned with the lifting and lowering of a load. A load is the item or items being lifted. A lifting operation may be performed manually or using lifting equipment. Lifting equipment includes any equipment or machinery used at work for lifting or lowering loads, including accessories and attachments used for anchoring, fixing or supporting the equipment. There is a wide range of lifting equipment in the industry.

A **crane** is a piece of equipment intended for raising or lowering a load and moving it horizontally including the supporting structure of the crane and its foundations. It is a type of machine, generally equipped with a hoist, wire ropes or chains, and sheaves, that can be used to lift and lower heavy materials and move them horizontally. Different types of cranes are listed in the Glossary (section 5).

A **hoist** is an integral mechanism of the crane unit, and is used for lifting and lowering a suspended load by means of a drum or lift-wheel around which a rope or a chain wraps. It may be manually operated, electrically or pneumatically driven and may use chain, fibre or wire rope as its lifting medium.

There are many different types of cranes and hoist systems. (See Glossary for more examples) There are a range of 'fixed' (tower, bridge, gantry, portal boom) and 'mobile' (slewing, non-slewing, vehicle loading) cranes. Some are powered, and some are designed to be operated manually. Note that mobile cranes are used and operated by subcontractors and not by Veolia staff.

Some plants have large overhead gantry cranes (bridge), which have a horizontal bridge across which a trolley and hoist travel. The bridge typically is situated on legs that run along fixed rails, wheels, or other runway systems. Larger gantry cranes are typically fixed installations and may be equipped with operator cabs or may

have remote controls designed to be operated from the floor level. Smaller gantry cranes can be of a portable design.

Another common crane installation is the jib crane, which typically has a boom arm of a monorail design and can be installed on walls, building supports, or stand-alone pedestals.

One of the most common crane designs is the monorail system which is a single I-beam rail structurally connected to the building and is designed to have a trolley hoist run along its length. End stops and trolley bumpers prevent the trolley from traveling off the monorail. Simple hoist clamps also can be attached to a monorail to provide a support for a hoist connection.

Cranes and hoists are used in conjunction with wire ropes, chain falls, hooks, slings and other lifting accessories to move loads that are too heavy to be moved by a person. Lifting accessories are components or equipments not attached to the lifting machinery, allowing the load to be held, which is placed between the machinery and the load or on the load itself, or which is intended to constitute an integral part of the load and which is independently placed on the market; slings and their components are also regarded as lifting accessories. These accessories include amongst others chains, ropes, slings, shackles, eyebolts, lifting/runway beams, lifting frames and vacuum lifting devices.

A range of people have specific responsibilities for cranes including the crane designer, manufacturer, importer and/or supplier, the crane owner and other persons with management or control of the crane or the workplace where a crane will operate, the competent or qualified person who inspects cranes, and of course, the crane operator.





## 2.0 > Main hazards of lifting operations

The risk assessment must assist in defining the preventive control measures that should be implemented by:

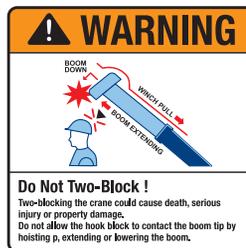
- Identifying those potentially exposed.
- Identifying the sources of risk and affected processes.
- Identifying the control measures that should be implemented.
- Following up on the effectiveness of the control measures implemented.

The most common safety hazards associated with lifting operation include:

- Hazards related to the loads, e.g. crushing due to impact of moving objects or loads falling because they are not slinged properly or the wrong type of slings were used.
- Electrocution due to contact with overhead power lines or even with indoor energized equipment that could be contacted by the crane superstructure or load while being moved.
- Being struck by hoisted materials either during transport horizontally or due to a dropped load.
- Severe injury also could result if the crane structure were to strike or impinge a person while the crane is moving.
- Two-blocking - the condition in which the lower load block (or hook assembly) comes in contact with the upper load block (or boom point sheave assembly), seriously interfering with safe operation of the crane.
- Fall of the lifting devices in case of strong wind when operating outside.

People who work with or near cranes are most at risk. Some of the risks when using a crane include:

- Structural failure or collapse of the crane.
- Overturning or tipping.
- Contact or collision of the crane or its load with people or other plant and structures.
- Falling objects.
- Falling from lifting platforms or being crushed when the platform moves.
- Hazards related to poor environment that may interfere with communication between workers or concentration needed for the task (noise) or cause sweaty, slippery objects (heat, poor ventilation).



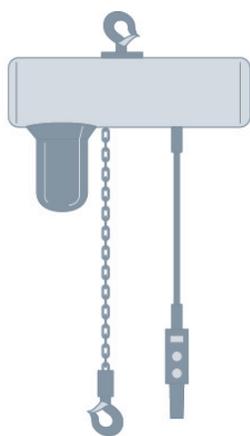


### 3.0 > Risk management - Hierarchy of control

Control measures must be ranked from the highest level of protection and reliability to the lowest. This ranking is known as the HIERARCHY OF CONTROL or RISK MANAGEMENT HIERARCHY. (See the table below)

You must always aim to eliminate a hazard which is the most effective control. If it is not reasonably practicable, the risk must be minimized by one or a combination of the following:

|                                    |                                      |   |   |
|------------------------------------|--------------------------------------|---|---|
| <b>HIGHEST</b>                     | <b>ENGINEERING</b>                   | Can the items be moved via a different method than a crane/hoist (e.g., transported via fork truck or material handling device)?                              | <b>MOST</b>                             |
| <br>Health & Safety Protection<br> | <b>ISOLATION</b>                     | Can barriers be put in place to remove people from the hazards (e.g., set up cones or barriers around the area where the items being lifted will be carried)? | <br>Reliability of control measures<br> |
|                                    | <b>ADMINISTRATIVE CONTROLS</b>       | Can training, increased supervision, procedures, rotation and signage minimize exposure? Only trained personnel should operate cranes!                        |   |
| <b>LOWEST</b>                      | <b>PERSONAL PROTECTIVE EQUIPMENT</b> | Can PPE protect the workers from the hazard or risk? (hard hat, safety boots, eye protection)   | <b>LEAST</b>                            |



**LIFTING OPERATIONS CAN BE PERFORMED MANUALLY OR BY USING LIFTING EQUIPMENT.**





#### 4.0 > Requirements

##### Application

This high-risk management standard applies to all lifting operations.

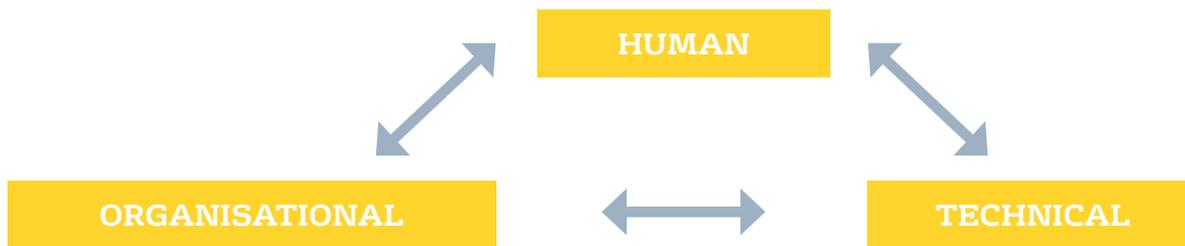
This standard applies to all Veolia business undertakings and operations involving employees, contractors, visitors or any other person.

This standard applies in addition to requirements prescribed by prevailing legislation, codes of practice, international standards and the manufacturer's safety recommendation.

##### Requirements and Departure (Adoption of Alternative Control Measures)

Use of the word "must" within this Protocol means a requirement is mandatory.

Use of the word "should" within this Protocol means the primary intent is that the requirement is mandatory but specific circumstances may mean implementation of the requirement is not reasonably practicable.



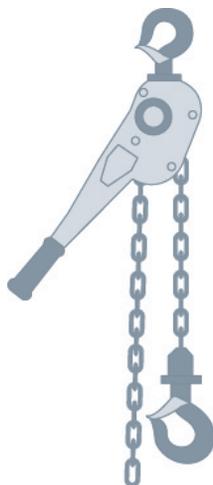
**LIFTING EQUIPMENT INCLUDES ANY EQUIPMENT OR MACHINERY USED AT WORK FOR LIFTING OR LOWERING LOADS, INCLUDING ACCESSORIES AND ATTACHMENTS.**





#### 4.o.1 – Human requirements

- 1. Suitably qualified or certified and/or competent person/s** must be involved in planning and supervising processes and lifting operations.
- 2. Operators.** Only designated and trained and licensed persons are allowed to rig, operate, inspect, or perform maintenance on cranes and hoists.
- 3. Training.** Staff that operate cranes/hoists must complete a crane and hoist awareness safety training. Beyond awareness level, employees that are anticipated to use, or will use a crane or hoist must complete and pass an initial overhead crane and hoist training program. This includes the classroom lecture, electronic media, hands-on demo (see Item 4), and written test that must be passed and recorded. This training must also include subject matter to qualify persons on conducting required inspections, proper rigging, tag line use, and signalling. This training must be conducted by a qualified trainer. An authorized examiner must assess the competence of the trainees and of trainers who provide training.
- 4. Hands on Demonstration.** Users/inspectors of floor operated cranes or hoists must be required to pass a practical operating examination on the type of equipment that they will be expected to use. At a minimum, documented on-hand practical demonstration training should be conducted at least every 5 years to maintain operator status.
- 5. Workforce must also receive training** related to their duties to act as supervisors. Training must be properly documented and readily available.
- 6. Site management is responsible** for maintaining written authorization for employees who are permitted to use a lifting device.
- 7. Additional Licensing.** In some jurisdictions, licensing for crane and hoist operators is required. It is the responsibility of each site manager to evaluate and implement these requirements as applicable.
- 8.** All personnel acting as signallers during the crane operations must be designated, trained, and clearly identified to the crane operator by using the local requested PPE as required by the responsible manager.
- 9. Safety** visits must include work behaviour observations and any need for additional specific training must integrate the results of those observations.



**STAFF THAT OPERATE CRANES/HOISTS  
MUST COMPLETE A CRANE AND HOIST AWARENESS  
SAFETY TRAINING.**





## 4.0.2 – Organizational requirements

### > 4.0.2.1 – General

1. **Inventory.** An inventory of overhead cranes/hoists must be conducted by either the customer or Veolia. Refer to the manufacturer's manual for each crane-hoist for specific information. All supporting structures of cranes, hoists, jibs, and trolleys must have appropriate documentation confirming that the load capacity meets or exceeds that of the crane and hoist markings. At customer locations, the client must provide Veolia with relevant information on the equipment along with necessary approvals.
2. **Rated Load Tests.** Cranes, hoists, and related equipment must have completed an initial test by a third party that proves their load capacity is in accordance with load test requirements. Documentation of completed load testing is required. Loads tests must be no less than 100% of rated load capacity and no more than 125% of the rated load capacity, unless otherwise recommended by the manufacturer or a qualified engineer. At customer sites, the customer normally arranges for load testing of cranes/hoist that Veolia staff may use. (For additional types of inspections, see section 4.2.2.)
3. **Equipment Modifications.** When existing cranes, hoists or associated equipment are modified or upgraded, the modification needs to be performed through a Management of change process (MOC). Those parts being modified must meet current code design and construction requirements. New, re-installed, altered, repaired and modified cranes and hoists must require a new Load Test on the crane or hoist per safety standards, and such modifications must be approved by a third party expert. Normal maintenance of cranes/hoists or associated equipment is not considered a modification or upgrade.
4. **No crane or hoist is allowed to be loaded in excess of its rated load.**
5. **Daily / Pre-operational Crane & Hoist Visual Inspection.** Daily/Pre-operational inspections should be in writing. The following items must be inspected each day; they are used prior to first use, as described below, of any crane or hoist:
  - Deterioration or leakage in lines, tanks, valves, drains, pumps, and other parts of air or hydraulic systems;
  - Hooks checked for cracks, deformation, latch engagement (if provided), and damage from chemicals;
  - Hoist rope for significant wear, kinking, crushing, bird-caging, corrosion, broken strands or wires. Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations;
  - Primary and secondary (if provided) hoist upper-limit switch/device for proper operation. Extreme care must be exercised. The block must be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the unit must be taken out of service, locked-out / tagged-out and the designated site person must be immediately notified;
  - Hoist braking system for proper operation. Special care must be exercised when a load approaching the rated load is handled. The brakes must be tested by raising the load a few inches and applying the brakes. This is done under load, prior to the scheduled lift being made.
  - Visual inspection of rigging equipment, to include but not be limited to straps



(ropes, chains, synthetic slings, metal mesh slings), end connectors, “D” rings, shackles, and eyebolts, for damage, wear, or other deficiencies that might reduce capacity or adversely affect the safety of the equipment or use on a crane or hoist.

**6. Markings.** The rated load capacity of cranes and hoists must be marked on each side of the unit as well as on each side of the bridge rails, mono-rail or other means of support. If a crane has more than one hoisting unit, each hoist must have its rated capacity marked on it and on its load block.

**7. Warnings.** Cab operated, remote-operated, floor operated cranes and hand operated hoists should have a warning label or labels affixed to the pendant station, portable operating station, or load block. (See Figure 1 below for an example) The label or labels would include but are not limited to cautionary language against:

- Lifting more than rated load.
- Operating hoist when load is not centered under hoist.
- Operating hoist with twisted, kinked, or damaged chain or rope.
- Operating damaged or malfunctioning crane.
- Lifting people.

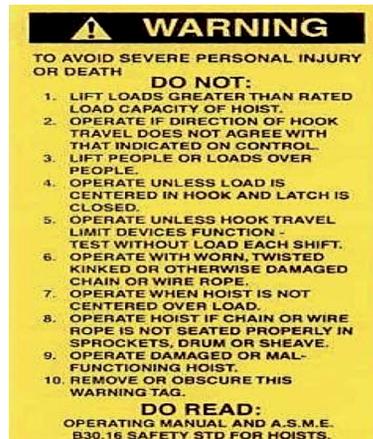


Figure 1

- Lifting loads over people.
- Operating a rope hoist with a rope that is not properly seated in its groove (not required for underhung hoists).
- Operating manual motions with other than manual power.
- Removing or obscuring safety label.

**8. Subcontractor program requirements.**

When Veolia arranges to have a subcontractor perform work that involves the use of cranes/hoists, the Veolia site management must coordinate lifting operations, to ensure that subcontractor staff is properly qualified and licensed to operate cranes/hoists, and to train the subcontractor on Veolia’s equipment if such equipment needs to be used.



**CRANES, HOISTS AND HOISTING EQUIPMENT REQUIRE REGULAR DOCUMENTED CHECKS, INSPECTION AND TESTING TO MAINTAIN SAFE OPERATION.**





#### > 4.0.2.2 – Inspections

Cranes, hoists and hoisting equipment require regular documented checks, inspection and testing to maintain safe operation. Inspections and checks are limited to employees with appropriate training and experience.

##### 1. Periodic Inspections by Third Party.

Documented inspections by an external third party must be performed per local existing regulations (e.g., normally every year or every two years). These inspections must not exceed 2 years. At customer sites, the customer would typically arrange for such inspections but Veolia should verify this has been done before using the cranes and inform the customer if there are any deviations. These inspections must meet the standard of the local safety regulatory authorities and/or other general industry accepted practices.

Such inspections should include but not be limited to the following:

- Examination of all components for deformation, cracks, or corrosion.
- Pins, bearings, shafts, gears, rollers, locking and clamping devices, bumpers, end stops for wear, bolts, rivets, nuts, and pins used in the crane, hoist, rails, trolley, end stops and/or other associated equipment for cracks, or distortion, other damage, loose fittings or absence.
- Check for suspect/counterfeit parts.
- Sheaves and drums for cracks, wear or imprinting.
- Complete brake-system(s) parts, linings, pawls, and latches for excessive wear or other damage.
- Load, wind, and other indicators over their full range for any significant inaccuracies.
- Chain-drive sprockets for excessive wear and chains for excessive stretch.

- Operational controls for signs of pitting or any deterioration of controllers, switches, contacts, limit switches, and pushbutton stations (not limited to these items).
- Hooks for damage from chemicals, deformation, cracks, or having excess of normal throat opening, excessive twist from the plane of the unbent hook.
- Non-destructive examination of hooks, retaining nuts, collars and pins, any welds, bearings, rivets or other suspect loadbearing parts.
- Testing and validation of motion limit devices for proper performance and integrity.
- All function, instruction, caution, and warning labels, and identification plates for accuracy and legibility.

2. **Inspection Records.** Inspections must be documented. Documentation must include at a minimum the name and title of the inspector, the unit that was inspected, the inspection date, the inspection findings and signature of the inspector, and be clear whether the unit can be operated or not. Inspection records must be kept on file for as long as the crane and/or equipment remain in service at the facility plus 5 years and be readily available for examination upon request.

3. **Parts found to be defective during an inspection or non-destructive examination** must require the unit to be taken out of service and locked-out / tagged-out, until such time as those defective or damaged parts can be reviewed and quantified by a qualified person and replaced or repaired as directed. Please refer to Veolia High-Risk Management Standard “Control of Hazardous Energy” for further guidance.



4. **Daily/Pre-operational / Pre-use inspections** must be done and written document should be fulfilled as described in section 4.2.1, (Item 5 above).
5. **The qualified inspector must examine deficiencies** and determine whether they constitute a safety hazard and whether the crane should be removed from service until it is repaired.
6. Before any crane or hoist that is taken out of service for deficiencies is returned to service, **those deficiencies must be corrected** and such corrections documented.
7. **Operators and/or other designated, qualified personnel must examine noted deficiencies** and determine whether the equipment should be removed from service or if a more detailed inspection is required.
8. In some jurisdictions, inspections of cranes and hoists and their components must be performed at set intervals such as weekly, monthly, and every six months, in addition to the daily pre-use checks and annual third party inspections discussed above.

#### > 4.0.2.3 – Safe Operation

The operator must be familiar with all operating controls and the operations to be performed; including, as applicable, the warnings on the crane-hoist, safe practices, and operation instructions provided by the manufacturer. Some standard safe practices include and could apply depending on the lifting operation being performed:

1. **Before moving the load the operator** must be sure chains or wire rope are not kinked or twisted or that multiple part chains or ropes are not twisted about each other.
2. **Hoists must not be operated unless the hoist unit is centered over the load.** Should it be necessary to pick a load that is not centered under the hoist unit, precautions must be taken to control the swing of the load when it is picked clear of its support.
3. **The operator must not pick up a load in excess of the rated load capacity** appearing on the hoist or load block, except during properly authorized tests or properly authorized planned engineered lift. Specific attention should be given to balancing the load and hitching or slinging to prevent slipping of the load.
4. **Operators must not engage in any practice** that will divert his or her attention while operating the crane.
5. **The operator must not lift or lower a load** with the hoist until the operator and all other personnel are clear of the load.
6. **To check the balance of the load,** it should not be lifted more than a few inches unless absolutely necessary.
7. **Suspended loads must not be left** unattended unless specific precautions have been instituted and are in place.
8. Persons are not allowed to walk or work under suspended loads. **Warning signs and/or barriers must be installed to prevent** access to areas beneath overhead cranes/hoists with suspended loads.
9. **Tag lines must be used as necessary** to guide or otherwise control the load.
10. **The operator must not use the upper** (or lower, if provided) limit device(s) as a normal means of stopping the hoist. These are emergency devices only.





- 11. **The operator must avoid swinging** the load or load hook when traveling the hoist.
- 12. **Personnel must not be carried** on the hook or the load.
- 13. **The operator must not move** loads over people.
- 14. **The operator must make sure** the load crane and hoist will clear all obstacles before moving the load.
- 15. If operating a crane from above, **the operator must ensure** that it is not being run by a controller below, by removing or restricting use of the controller.
- 16. **Prior to lifting the load**, the area should be marked off with barriers, cones, etc., or an area should be painted to mark the lifting zone.
- 17. **The weather conditions must be checked when operating outside (especially wind speed).**

#### 4.0.3 – Technical requirements

- 1. **Crane & hoist used for Veolia activities shall** meet current code design and construction requirements.
  - 2. **Controls** (remote control, levers or buttons), must be designed, arranged and secured so as to prevent the activation by every unauthorized person.
  - 3. To make the updated periodic inspection easily seen (in addition to the inspection sticker), a tag should be put in place on the hoist.
  - 4. **Markings.** The rated load capacity of cranes and hoists must be marked on each side of the unit as on each side of the bridge rails, mono-rail or other means of support. If a crane has more than one hoisting unit, each hoist must have its rated capacity marked on it and on its load block.
  - 5. **Lift Plans.** Although not required for normal or routine lifts at a Veolia plant site, the following cases are those that require that a written lift plan be developed and certified by a designated engineering professional:
    - All tandem lifts, those involving more than one hoist or crane on a single load.
    - Lifts that require exceptional care in handling because of size, weight, close-tolerance installation, high susceptibility to damage, or other unusual factor. For example, loads of any type in close proximity to equipment such as: turbine, generator, boiler, non-redundant equipment or hazardous chemicals.
    - If the customer requires a lift plan.
- Lift plans should include information** on the crane size, type and capacity; the weight of the load being lifted along with engineering calculations; information on rigging including lifting angle and method of fastening; the description of the lift and nearby hazards; operator and crew certifications, and signatures by the operator, engineer, and EHS at a minimum.



## 5.0 > Glossary

**All-terrain crane:** is a mobile, truck mounted crane with the necessary equipment to travel at speed on public roads, and on rough terrain at the job site using all-wheel and crab steering.

**Cantilever gantry crane:** a gantry or semi-gantry crane in which the bridge girders or trusses extend transversely beyond the crane runway on one or both sides.

**Crane:** a machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine. Cranes whether fixed or mobile are driven manually or by power.

**Crawler crane:** is a crane mounted on an undercarriage with a set of tracks (also called crawlers) that provide stability and mobility. They need little set-up and can travel with a load but are very heavy and cannot easily be moved from one job site to another.

**Designated person:** A person selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

**Gantry crane:** a crane similar to an overhead crane except that the bridge for carrying the trolley or trolleys is rigidly supported on two or more legs running on fixed rails or other runway.

**Hoist:** an apparatus which may be a part of a crane, exerting a force for lifting or lowering.

**Job Safety Analysis (JSA) - is a method that can be used to identify, analyze and record:**

- The steps involved in performing a specific job.
- The existing or potential safety and health hazards associated with each step.
- The recommended action(s)/procedure(s) that will eliminate or reduce hazards and the risk of a workplace injury or illness.

**Mobile crane:** is a cable-controlled crane mounted on crawlers or rubber-tired carriers or a hydraulic-powered crane with a telescoping boom mounted on truck-type carriers or as self-propelled models. They are designed to easily transport to a site and use with different types of load and cargo with little or no setup or assembly.

**Overhead crane:** a crane with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.

**Qualified/Competent Person:** a person who must have a recognized degree, certificate or extensive experience in the subject matter and the ability to solve the subject problem at the worksite.

**Telescopic crane:** has a boom that consists of a number of tubes fitted one inside the other. A powered mechanism extends or retracts the tubes to increase or decrease the total length of the boom. These types of booms are highly adaptable, are often truck mounted and used for short term construction projects.

**Tower crane:** is a balance crane that consist of the same basic parts. Fixed to the ground on a concrete slab, tower cranes offer height and high lifting capacity. The base is then attached to the mast which gives the crane its height. The mast is attached to the slewing unit (gear and motor) that allows the crane to rotate.

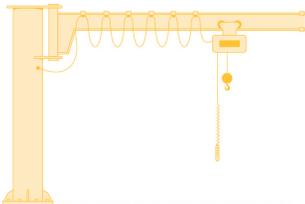
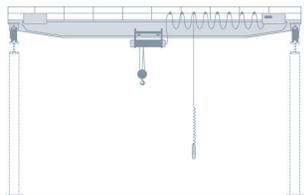
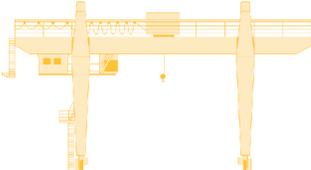
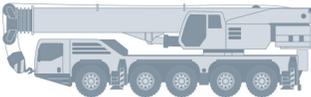
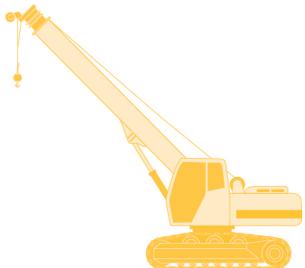
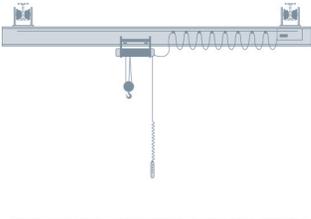
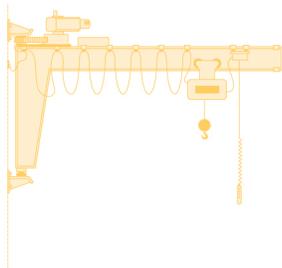
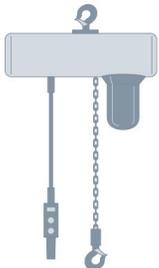
**Wall crane:** a crane having a jib with or without trolley and supported from a side wall or line of columns of a building. It is a traveling type and operates on a runway attached to the side wall or columns.



**THE RATED LOAD CAPACITY OF CRANES AND HOISTS MUST BE MARKED ON EACH SIDE OF THE UNIT AND ON OTHER MEANS OF SUPPORT.**





|   |   |   |
|---|---|---|
|    |    |    |
| <b>Tower Crane</b>  | <b>Mobile/Telescopic Crane</b>  | <b>Jib Crane</b>  |
|  |  |  |
| <b>Overhead Crane</b>   | <b>Cantilever Gantry Crane</b>  | <b>All Terrain Crane</b>  |
|  |  |  |
| <b>Crawler Crane</b>  | <b>Monorail Crane</b>   | <b>Wall Crane</b>   |
|  |  |  |
| <b>Hoist</b>  | <b>Chain Fall Hoist</b>   | <b>Ratchet Hoist</b>  |





## APPENDIX 1 > Applicability and Compliance Assessment

| > REQUIREMENTS   | C | NC |
|--|---|----|
| <b>HUMANS</b>  |   |    |
| 1. <b>Suitably qualified, certified and/or competent person/s</b> must be involved in planning and supervising processes and lifting operations.   |   |    |
| 2. <b>Operators.</b> Only designated and trained persons are allowed to rig, operate, inspect, or perform maintenance on cranes and hoists. Training must be documented and retained in the employees training file.   |   |    |
| 3. <b>Training.</b> Staff that operate cranes/hoists must complete a crane and hoist awareness safety training. Beyond awareness level, employees that are anticipated to use, or will use a crane or hoist must complete and pass an initial overhead crane and hoist training program. This includes the classroom lecture, electronic media, hands-on demo (see Item 4), and written test that must be passed and recorded. This training must also include subject matter to qualify persons on conducting required inspections, proper rigging, tag line use, and signalling. This training must be conducted by a qualified trainer. An authorized examiner must assess the competence of the trainees and of trainers who provide the training. |   |    |
| 4. <b>Hands on Demonstration.</b> Users/inspectors of floor operated cranes or hoists must be required to pass a practical operating examination on the type of equipment that they will be expected to use. At a minimum, documented on-hand practical demonstration training should be conducted at least every 5 years to maintain operator status.   |   |    |
| 5. <b>Workforce must also receive training</b> related to their duties to act as supervisors. Training must be properly documented and readily available.  |   |    |
| 6. Site management is responsible for maintaining written authorization for employees who are permitted to use a lifting device.   |   |    |
| 7. <b>Additional Licensing.</b> In some jurisdictions, licensing for crane and hoist operators is required. It is the responsibility of each site to evaluate and implement these requirements as applicable.  |   |    |
| 8. All personnel acting as signallers during the crane operations must be designated, trained / and clearly identified to the crane operator by using the local requested PPE as required by the responsible manager.  |   |    |
| 9. <b>Safety visits</b> must include work behaviour observations and any need for additional specific training must integrate the results of those observations.   |   |    |
| <b>ORGANISATIONAL</b>  |   |    |
| <b>General</b>   |   |    |
| 1. <b>Inventory.</b> An inventory of overhead cranes/hoists must be conducted by either the customer or Veolia. Refer to the manufacturer's manual for each crane-hoist for specific information. All supporting structures of cranes, hoists, jibs, and trolleys must have appropriate documentation confirming that the load capacity meets or exceeds that of the crane and hoist markings. At customer locations, the customer must provide Veolia with relevant information on the equipment along with necessary approvals.  |   |    |
| 2. <b>Rated Load Tests.</b> Cranes, hoists, and related equipment must have completed an initial test by a third party that proves their load capacity is in accordance with load test requirements. Documentation of completed load testing is required. Loads tests must be no less than 100% of rated load capacity and no more than 125% of the rated load capacity, unless otherwise recommended by the manufacturer or a qualified engineer.   |   |    |





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| <p><b>3. Equipment Modifications.</b> When existing cranes, hoists or associated equipment are modified or upgraded, those parts being modified must meet current code design and construction requirements. New, re-installed, altered, repaired and modified cranes and hoists must require a new Load Test on the crane or hoist per the local standards. Normal maintenance of cranes/hoists or associated equipment is not considered a modification or change.</p>   |  |  |
| <p><b>4. No crane or hoist is allowed to be loaded in excess of its rated load.</b></p>  |  |  |
| <p><b>5. Daily / Pre-operational Crane &amp; Hoist Visual Inspection.</b> Daily/Pre-operational inspections should be in writing. The following items must be inspected each day it is used prior to first use, as described below, of any crane or hoist:</p> <ul style="list-style-type: none"> <li>• Deterioration or leakage in lines, tanks, valves, drains, pumps, and other parts of air or hydraulic systems;</li> <li>• Hooks checked for cracks, deformation, latch engagement (if provided), and damage from chemicals;</li> <li>• Hoist rope for significant wear, kinking, crushing, bird-caging, corrosion, broken strands or wires. Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer’s recommendations;</li> <li>• Primary and secondary (if provided) hoist upper-limit switch/device for proper operation. Extreme care must be exercised; the block must be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the unit must be taken out of service, locked-out / tagged-out and the designated site person must be immediately notified;</li> <li>• Hoist braking system for proper operation; Special care must be exercised when a load approaching the rated load is handled. The brakes must be tested by raising the load a few inches and applying the brakes. This is done under load, prior to the scheduled lift being made.</li> <li>• Visual inspection of rigging equipment, to include but not be limited to straps (ropes, chains, synthetic slings, metal mesh slings), end connectors, "D" rings, shackles, and eyebolts, for damage, wear, or other deficiencies that might reduce capacity or adversely affect the safety of the equipment or use on a crane or hoist.</li> </ul> |  |  |
| <p><b>6. Markings.</b> The rated load capacity of cranes and hoists must be marked on each side of the unit as well as on each side of the bridge rails, mono-rail or other means of support. If a crane has more than one hoisting unit, each hoist must have its rated capacity marked on it and on its load.</p>  |  |  |
| <p><b>7. Warnings.</b> Cab operated, remote-operated, floor operated cranes and hand operated hoists must have a warning label or labels affixed to the pendant station, portable operating station, or load block.</p>  |  |  |
| <p><b>8. Subcontractor program requirements.</b> When Veolia arranges to have a subcontractor perform work that involves the use of cranes/hoists, the Veolia site management must coordinate lifting operations, to ensure that subcontractor staff is properly qualified to operate cranes/hoists, and to train the subcontractor on Veolia’s equipment if such equipment needs to be used.</p>  |  |  |
| <p><b>Inspections:</b> Cranes, hoists and hoisting equipment require regular documented checks and inspection and testing, both pre-use and on a periodic basis, to maintain safe operation. Inspections and checks are limited to employees with appropriate training and experience.</p>   |  |  |
| <p><b>1. Periodic Inspections by Third Party.</b> Documented inspections by an external third party must be performed per local regulations (e.g., normally every year or every two years). These inspections must not exceed 2 years. At customer sites, the customer would typically arrange for such inspections but Veolia should verify this has been done before using the cranes and inform the customer if there are any deviations. These inspections must meet the standard of the local safety regulatory authorities and/or other general industry accepted practices.</p>   |  |  |
| <p><b>2. Inspection Records.</b> Inspections must be documented. Documentation must include at a minimum the name and title of the inspector, the unit that was inspected, the inspection date, the inspection findings and signature of the inspector. Inspection records must be kept on file for as long as the crane and/or equipment remain in service at the facility plus 5 years and be readily available for examination upon request.</p>  |  |  |



| ORGANISATIONAL   | C | NC |
|--|---|----|
| 3. <b>Parts found to be defective during an inspection or non-destructive examination must require</b> the unit to be taken out of service and locked-out / tagged-out, until such time as those defective or damaged parts can be reviewed and quantified by a qualified person and replaced or repaired as directed  |   |    |
| 4. <b>Daily/Pre-operational / Pre-use inspections</b> must be done and a written document full filled  |   |    |
| 5. <b>The qualified inspector must</b> examine deficiencies and determine whether they constitute a safety hazard and whether the crane should be removed from service until it is repaired.   |   |    |
| 6. Before any crane or hoist that is taken out of service for deficiencies is returned to service, <b>those deficiencies must be corrected and such corrections documented.</b>  |   |    |
| 7. <b>Operators and/or other designated, qualified personnel must examine noted deficiencies</b> and determine whether the equipment should be removed from service or if a more detailed inspection is required.  |   |    |
| 8. In some jurisdictions, inspections of cranes and hoists and their components must be performed at set intervals such as weekly, monthly, and every six months, in addition to daily pre-use checks and annual third party inspections.  |   |    |
| <b>Safe Operation Practises:</b> The operator must be familiar with all operating controls and the operations to be performed; including, as applicable, the warnings on the crane-hoist, safe practices, and operation instructions provided by the manufacturer. Some standard safe practices include and could apply depending on the lifting operation being performed:. |   |    |
| 1. <b>Before moving the load the operator must be sure</b> chains or wire rope are not kinked or twisted or that multiple part chains or ropes are not twisted about each other  |   |    |
| 2. <b>Hoists must not be operated unless the hoist unit is centered over the load.</b> Should it be necessary to pick a load that is not centered under the hoist unit, precautions must be taken to control the swing of the load when it is picked clear of its support.   |   |    |
| 3. <b>The operator must not pick up a load in excess of the rated load capacity</b> appearing on the hoist or load block, except during properly authorized tests or properly authorized planned engineered lift. Specific attention should be given to balancing the load and hitching or slinging to prevent slipping of the load.   |   |    |
| 4. <b>Operators must not engage in any practice</b> that will divert his or her attention while operating the crane.   |   |    |
| 5. <b>The operator must not lift or lower a load with the hoist</b> until the operator and all other personnel are clear of the load.  |   |    |
| 6. <b>To check the balance of the load,</b> it should not be lifted more than a few inches unless absolutely necessary.  |   |    |
| 7. <b>Suspended loads must not be left unattended</b> unless specific precautions have been instituted and are in place.   |   |    |
| 8. Persons are not allowed to walk or work under suspended loads. <b>Warning signs and/or barriers must be installed to prevent</b> access to areas beneath overhead cranes/hoists with suspended loads.   |   |    |
| 9. <b>Tag lines must be used as necessary</b> to guide or otherwise control the load.  |   |    |
| 10. <b>The operator must not use the upper</b> (or lower, if provided) limit device(s) as a normal means of stopping the hoist. These are emergency devices only.  |   |    |





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| 11. The operator must avoid swinging the load or load hook when traveling the hoist  |  |  |
| 12. Personnel must not be carried on the hook or the load  |  |  |
| 13. The operator must not move loads over people   |  |  |
| 14. The operator must make sure the load crane and hoist will clear all obstacles before moving the load.  |  |  |
| 15. If operating a crane from above, the operator must ensure that it is not being run by a controller below, by removing or restricting use of the controller.  |  |  |
| 16. Prior to lifting the load, the area should be marked off with barriers, cones, etc., or an area should be painted to mark the lifting zone.  |  |  |
| 17. The weather conditions must be checked when operating outside (especially wind speed)  |  |  |
| <b>TECHNICAL</b>   |  |  |
| 1. Crane & Hoist used for Veolia activities shall meet current code design and construction requirements.  |  |  |
| 2. Controls (remote control, levers or buttons), must be designed, arranged and secured so as to prevent the activation by every unauthorized person.  |  |  |
| 3. To make the updated periodic inspection easily seen (in addition to the inspection sticker), a tag should be put in place on the hoist.   |  |  |
| 4. Markings. The rated load capacity of cranes and hoists must be marked on each side of the unit as well as on each side of the bridge rails, mono-rail or other means of support. If a crane has more than one hoisting unit, each hoist must have its rated capacity marked on it and on its load block.  |  |  |
| 5. <b>Lift Plans.</b> Although not required for normal or routine lifts at a Veolia plant site, the following cases are those that require that a written lift plan be developed and certified by a designated engineering professional: <ul style="list-style-type: none"> <li>• If the maximum level of load for any lift exceeds 75% of the rated capacity</li> <li>• All tandem lifts, those involving more than one hoist or crane on a single load.</li> <li>• Lifts that require exceptional care in handling because of size, weight, close-tolerance installation, high susceptibility to damage, or other unusual factor. For example, loads of any type in close proximity to equipment such as: turbine, generator, boiler, non-redundant equipment or hazardous chemicals.</li> <li>• If the customer requires a lift plan</li> </ul> <p>Lift plans should include information on the crane size, type and capacity; the weight of the load being lifted along with engineering calculations; information on rigging including lifting angle and method of fastening; the description of the lift and nearby hazards; operator and crew certifications, and signatures by the operator, engineer, and EHS at a minimum.</p> |  |  |



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