

## SOP-GEN-010 Crane and Winch Operations

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### 1.0 Introduction

Cranes and winches are an essential part of our scientific operations and require special attention. This Standard Operating Procedure (SOP) describes how the vessel will conduct crane and winch operations and how to train and qualify operators.

### 2.0 Responsibilities

It is the responsibility of the Staffing Manager to establish the criteria that will be used to qualify crane and/ or winch operators and to ensure that qualified operators are on board when required.

Crane and winch operators are responsible for conducting daily inspections, reporting any operational or maintenance issues to the Chief Engineer and operating the equipment in accordance with manufacturer recommendations and the TDI-Brooks Safety Management System.

As the designated HSE Officer, it is the Chief Mate's responsibility to ensure that lifting activities on the vessel are in compliance with the vessel's Safety Management System.

The Chief Engineer is responsible for maintaining cranes and winches in a safe and reliable condition and recording maintenance in the Maintenance program.

It is the responsibility of the Port Engineer and Port Captain to ensure that any gear added to the vessel is designed, built, and installed to meet specifications and can be used safely with regard to vessel stability.

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### 3.0 References

The following documents are used as general guidelines for TDI-Brooks procedures.

- 46 CFR 189.35 Weight Handling Gear (Oceanographic Research Vessels)
- 29 CFR 1917.45 Cranes and Derricks (Marine Terminals)
- 29 CFR 1917.47 Winches (Marine Terminals)
- API-RP 2D

### 4.0 Training and Qualifications

All operators must be trained and qualified prior to operating the equipment. These are two separate qualifications.

**Winch Operator**- A qualified winch operator serves as the deck supervisor and is responsible for ensuring the safety of the deck crew. TDI-Brooks conducts in-house training and qualification for this position.

**Crane Operator**- Any member of the crew or science team may be trained and qualified as a crane operator either by a third party or by TDI-Brooks in-house training program.

### 5.0 Operational Inspections

In addition to regular preventative maintenance, the operator is required to inspect the equipment before use. There is usually a binder with blank and completed inspection forms kept near the equipment.

During ongoing operations, inspections should be conducted daily or at the beginning of each shift. If you are using the crane or winch throughout the day, you only need to complete the written inspection before the first load. A second written inspection is required that day only if a new operator takes over.

Specific areas that may be inspected during detailed inspections include:

- Status of hydraulic rams (i.e., not leaking, not pitted, properly oiled and protected from the environment);
- Hydraulic fittings in acceptable condition without leakage and corrosion;
- Hydraulic hoses not leaking;
- Corrosion and metal wasting;
- All zerk fittings properly greased;
- Load capacities properly displayed;
- Condition of heel block and over boarding blocks;
- Condition, proper capacity (and security) of shackles and attachment devices;

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- Condition of tuggers, whips and brakes;
- Security and condition of grating and footings;
- Equipment stands;
- Condition and position of safety chains and fasteners;
- Lights (functioning and positioning), wiring (fraying) and electrical connection boxes;
- Operational controls free and working;
- Energize the power source;
- Control functions correspond to directional control placards;
- Control placards and warnings in place and legible;
- On/ Off switch placard clearly visible and legible; and
- Restrictions placards in place as applicable.

## 6.0 Maintenance & Load Tests

The Chief Engineer is responsible for maintaining the crane and winch, but this can be complicated by science operations. During active science operations, regular planned maintenance may need to be delayed to accommodate science activities.

If a technical crew is on board and working with this equipment, they must report all maintenance issues to the Chief Engineer and get his permission to perform any repairs or maintenance if they are qualified to do so. All maintenance, regardless of who does the repair, must be recorded in the Maintenance program and linked to the equipment.

Winches and cranes are load tested annually. New load test certs should be scanned and emailed to [LiftGear@tdi-bi.com](mailto:LiftGear@tdi-bi.com). Load test certificates are kept on the vessel in the Lifting Gear Register and posted on the Crewing Module.

## 7.0 Cranes

**Only qualified operators may use the crane.** TDI-Brooks vessels have a crane to lift heavy loads to and from the vessel, as well as deploy /retrieve scientific equipment.

### General Guidelines

- Do not use the crane in bad weather or rough seas except for emergencies.
- All cranes, winches, and other lifting devices must be certified and inspected at regular intervals.
- The SWL must be prominently displayed on the boom of any crane.
- All slings, hooks, wire lines, cables, and tag lines should be secure and in good working order. Records and inspections should be maintained.

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- The maximum capacity and boom angle of the crane must be clearly marked and must not be exceeded. This information will be available on lift charts attached to the crane. Boom-angle indicators must be permanently attached to the boom to indicate the radius to the operator.
- Crane hooks must have safety latches; stops must be in place on all crane booms to prevent overtopping the boom.
- A hand signal chart must be mounted near or on the crane.
- Do not attempt crane or other lifting device operations alone.
- Never stand under a suspended cargo load or in a path that the load would follow should the lifting cable break.
- Use tag lines to guide loads when appropriate.
- Do not stand in the recoil path of a rope or cable that is under strain or in a path it might follow should it part.
- Do not wear loose clothing, handle ropes or cables while wearing rings on your fingers or wear long hair unsecured when near rotating machinery.
- Do not ride on load being hoisted.
- Check, use, and maintain the correct cargo handling tools.

**Before the lift:**

- Always notify the bridge prior to using crane.
- **Complete a Pre-Use Inspection of the crane and file it in the inspection binder.**
- **Any defect found during the inspection must be repaired prior to use.**
- Inform personnel working in the vicinity of cranes and cargo of the operation and safe procedures associated with this operation.
- Check oil filter pressure and operating pressure prior to operation.

**During the lift:**

- The loads being lifted must be watched by a spotter at all times.
- Always make sure there are at least three wraps on the drum.
- Stay clear of stacks, cables, and handrails when lifting.
- Do not exceed safe working load or maximum boom angle.

**After the lift:**

- The operator must properly secure the crane and boom before going off duty or when shutting down operations.

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## 8.0 Winches

**Only qualified operators may use the winch.** The winch operator is responsible for completing a written winch inspection, including the winch, rope or wire termination and associated equipment such as blocks and pad eyes, at the start of his watch. If there are any concerns, the winch operator should consult the engineering department and advise the bridge.

The winch operator is also the Deck Chief. The Deck Chief is responsible for ensuring that the deck crew is using all required PPE and is working safely during deck operations.

The following are guidelines for winch operations.

### **Before the lift:**

- Visually inspect all equipment involved in winch operations.
- Inspect levelwind alignment.
- Check for broken wire stands, soundness of any splices, terminations, and buried wraps. Verify that the rope on the drum is not loose.
- Check for any leaking fluids.
- Make sure all blocks and fairleads are free turning.
- Inspect all rigging.
- Ensure that winch gear is engaged.
- Ensure work area is clear of obstructions.
- Wear proper PPE.
- Ensure that deck crew understands nature of operations and their role.
- Test the operation of the brakes.
- Verify that communication protocols are set and used.
- Notify bridge before equipment is deployed and when back on deck.
- Do not lift anything above the SWL.
- Use a tag line when appropriate during a lift.
- Winch operator must keep everyone clear of load.
- Do not run winch unless there is sufficient tension on the rope to avoid loose wraps.

### **During the lift:**

- Avoid sudden starts and stops.
- Do not exceed the optimum winch speed.
- Keep an eye on the winch and wire continuously during operations.

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- Record the maximum wire out and tension.

## 9.0 Mobile Crane Hand Signals Chart

### MOBILE CRANE HAND SIGNALS



**RAISE THE LOAD**



**RAISE THE BOOM**



**SWING**



**LOWER THE LOAD**



**LOWER THE BOOM**



**DOG EVERYTHING**



**RAISE THE LOAD**



**EXTEND BOOM**



**EMERGENCY STOP**



**LOWER THE LOAD**



**RETRACT BOOM**



**STOP**

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