

# Emergency Towing of DriX:

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Towing DriX from a large vessel is considered an emergency response. As such, this procedure does not include the required markings, lights and other accessories required to establish a long duration tow. It is appropriate for short durations (<24 hours), when the DriX cannot be recovered through normal means. Examples include fouling of the keel such that it cannot be retracted for recovery, malfunction of DriX docking and associated systems, or malfunction of DriX itself when weather and seas prohibit safe deployment of a small boat recovery team.

## Recommended Equipment:

**Tow line:** 600 ft (200 m) of ¾ in, (18 mm), 3 strand nylon or similar line. The line should be marked 100 ft from the bitter end, and may optionally be marked in 30 ft increments. The tow line must be free of knots, having splices for required terminations. An extra 600 ft (200 m) length of this line with eye splices on both ends should be made available if more line is needed. Both lines are stored in 55 gallon trashcans with both spliced ends tied off outside to prevent knots to tangling.

*NB: Nylon line sinks which is preferable for towing, but may require a float to prevent the line from fouling the ship's screw. Floating line may be a suitable alternative, but will likely require weight along the line to ensure it tows under water.*

**Heaving Lines/weak link:** Two heaving lines, 100 ft in length, minimum, each with a heaving monkey's fist. The monkey's fist is thrown over the bow of the DriX and when pulled taught will lodge into the DriX "sharkfin" tow point. Paint-on anti-chafing just above the monkey's fist is recommended for long tows. The 2<sup>nd</sup> heaving line is intended to be used if the 1<sup>st</sup> heaving line missed the Drix's towing point.

**Large Buoy/Fender:** Used in the event the tow must be released, to keep the bitter end of tow line afloat.

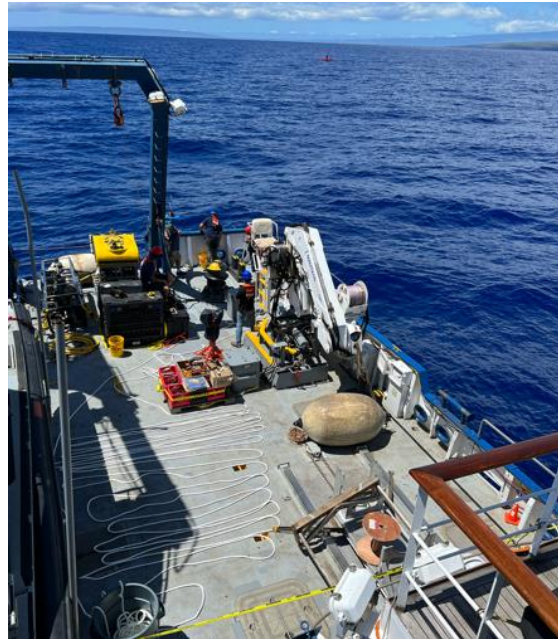
**Tow-line float:** Mid-sized float with 30 m line, optionally placed on the tow line to ensure the line does not sink into the screw.

Optional:

**Tow line weights:** Shackles or other objects that can be added to the tow line to prevent the tow line from raising above the water line.

## Deck Operations:

The tow line should be faked out on deck or fed into a large trash can or similar container from which it can feed out freely.



A bight of tow line is pulled through an aft hawsehole and secured to the bollard. This provides the bitter end over the rail for attachment to a large buoy, allowing the buoy to be freely released over the side if tow line must be let go.



The small buoy is shackled on tow line, and if necessary to keep line from sinking into screw, positioned along the tow with a second line, allowing the buoy to ride down the towline ~30 m (100 ft) back. In the image above, the small buoy is stationed ready to deploy.



DriX is approached by the ship in DP mode, bringing DriX to the STBD Aft Quarter, within heaving distance of the deck and outboard stern transom. It is recommended to have two heaving lines in preparation allowing a rapid second throw should the first heaver miss his/her mark.

**CAUTION:**

During towing operations, all hands not involved in towing operations shall remain clear of the back deck and non-essential deck crew must remain clear of the towing lines.



Once the monkey's fist is thrown over the DriX, the ship is maneuvered forward at 1-2 knots, while line is fed through the hawsehole keeping just enough tension on the line to maintain the monkey's fist seated in the DriX towpoint. Care must be taken to anticipate ship movements so as not to inadvertently pull DriX into the ship.

As the DriX tow tension increases, the tow should be faired through the bollard, or alternatively around the capstan as the deck chief slips the line to the desired tow length.

With 100 m of tow line out, the ship can increase speed to 2 knots.

At 500 m of tow line out the ship can proceed at a safe speed not exceeding 6 knots, adjusting speed slower based on sea-state, winds, vessel traffic, and tow performance.

If the seastate affects DriX's ability to track behind the ship, the extra 600 feet of towline can be shackled in and deployed.

#### CAUTION:

During towing operations, the tow line must not be pulled free of the water. In the event the tow line parts, keeping the towline submerged will help to protect personnel. Reduce ship's speed or add weights to the tow line to prevent pulling the line free of the water during tow.