

U.S. Department
of Transportation

United States
Coast Guard



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United States Coast Guard

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NVIC 5-92

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO.

5-92

27 JUL 1992

Subj: Guidelines for Wire Rope Towing Hawsers

1. PURPOSE. This Circular disseminates guidelines recommended by the Towing Safety Advisory Committee (TSAC) for the selection, maintenance, and inspection of wire rope towing hawsers.
2. BACKGROUND.
 - a. Failure to properly use, inspect, and maintain wire rope towing hawsers has contributed to the causes of marine casualties and oil spills. Inadequate emergency reconnection procedures compound the consequences of towing hawser failure.
 - b. In 1990, the Coast Guard requested TSAC to review and evaluate current industry towing practices and develop recommended wire rope inspection, maintenance, and emergency reconnection guidelines. In December 1991, TSAC submitted their guidelines to the Coast Guard, recommending they be published in a Navigation and Vessel Inspection Circular for dissemination to the towing industry.
3. DISCUSSION.
 - a. There have been widely recognized guidelines used by the marine industry for wire rope selection, inspection, maintenance, or emergency recovery of barges after towing hawser failure. Some companies have developed their own guidelines containing towing practices or use of specific equipment that best suited their operations.

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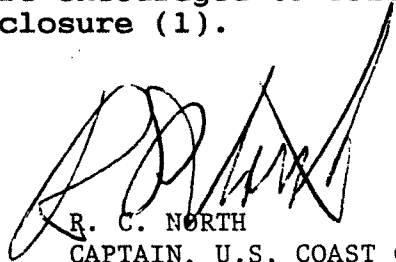
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3. a. (cont'd) Many companies do not have written policies and practices to ensure safe towing operations.
- b. Enclosure (1) contains the guidelines recommended by TSAC. These general guidelines are flexible enough to accommodate diverse towing operations while promoting safe, prudent industry practices. The Coast Guard believes use of these guidelines will help reduce the occurrence of tow-wire failure and pollution incidents.

4. IMPLEMENTATION.

- a. Coast Guard Officers in Charge, Marine Inspection and Captains of the Port are urged to bring enclosure (1) to the attention of appropriate individuals in the marine industry in their zones.
- b. Owners, operators, and crews of towing vessels using wire rope towing hawsers are encouraged to follow the recommendations of enclosure (1).



R. C. NORTH
CAPTAIN, U.S. COAST GUARD
DEPUTY CHIEF, OFFICE OF MARINE SAFETY,
SECURITY & ENVIRONMENTAL PROTECTION

Encl: (1) Towing Safety Advisory Committee's Recommended Guidelines for Wire Rope Towing Hawser Selection, Use, Maintenance, and Emergency Reconnection

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**TOWING SAFETY ADVISORY COMMITTEE'S RECOMMENDED
GUIDELINES FOR WIRE ROPE TOWING HAWSER SELECTION,
USE, MAINTENANCE, AND EMERGENCY RECONNECTION**

A. WIRE ROPE SELECTION

When considering wire for a towing hawser, the operator should talk to the various wire rope manufacturers for recommendations about the most suitable wire for their towing operation. Factors which should be considered are the bollard pull of the towing vessel, the area of operation, and the type and sizes of barges to be towed. The purchase order should be specific about the wire size, lay, and lubrication during manufacture.

The breaking strength of the wire rope must be certified by the manufacturer by way of pull-testing to destruction a portion of wire from the mill run from which it originated. This test must be witnessed by an ABS representative and a certificate of test results furnished to the buyer. When the wire is received, the buyer should have a piece of wire 20 to 25 feet long cut from the coil and pulled to destruction to compare the breaking strength of the wire to the ABS certification. This gives a bench mark for comparison at a future date when the wire is tested after a period of use.

Chain bridles, leader chain, all shackles, pins, and sockets, that are to be used as part of the towing gear, should be certificated from the manufacturer or supplier when purchased. This certification should show: (1) that the piece of equipment has been tested; (2) the proof load applied in short tons; and (3) the safe working load in short tons.

B. WIRE ROPE RECORDS, INSPECTIONS, AND MAINTENANCE IN USE

When a new hawser is put aboard a towing vessel, a record should be made of the destruction pull test on the new wire and the date use was begun. On a monthly basis, records should show the hawser usage in sea miles. The master of the tug should be responsible for keeping this record and reporting the same to management.

Based on hawser usage, an operator should be able to develop an inspection schedule. Providing no significant damage is observed during use, a good time interval for removal of the hawser from the winch drum for a complete inspection is between 25,000 to 40,000 sea miles, depending on the severity of use. This inspection should check for damage, wear, and interior lubrication. It should also include caliper measurements of the hawser's diameter to determine where the hawser has deteriorated. From this inspection, the operator can decide how many more sea miles the hawser should be used before the next complete inspection or when it should be retired from service.

On a continuing basis all shackles, pins, sockets, and splices should be inspected for wear or damage and replaced if necessary.

Before starting a voyage, the Master should inspect all parts of the towing gear, including: (1) the shackle connection of the tow wire to the surge chain; (2) the shackle connection of the surge chain to the chain bridle; (3) the condition of shackle connections of the bridle to the barge's tow pads; and (4) the condition of the tow pads.

When paying out the towing hawser at the beginning of a voyage, the wire should be watched and examined for damage.

To prevent excessive operational wear on the hawser and stern roller, a heavy duty chaffing shoe should be used where the hawser bears on the stern roller during the tow. To prevent chaffing, particular care should be taken to insure that the stern roller and towing pins are in good condition.

When retrieving the towing hawser from the sea to the winch drum, the wire should again be observed to make sure no damage has occurred during the tow. The towing winch should have a level wind mechanism so the wire will spool even and tightly. This measure will extend the life of the wire. Otherwise, improper winding will result in crushed rope which results in kinks and rust formation leading to premature failure.

As the wire is reeled onto the winch drum, it should be sprayed or mopped with a neutral-pH petroleum lubricant that will penetrate and adhere to the rope.

C. SUGGESTED EMERGENCY RECONNECTION PROCEDURES

The failure of wire towline may still occur due to unexpected situations and unseen emergencies. Review of ocean towing company practices concluded that there are two principle ways to retrieve a tow.

Emergency Insurance Wire:

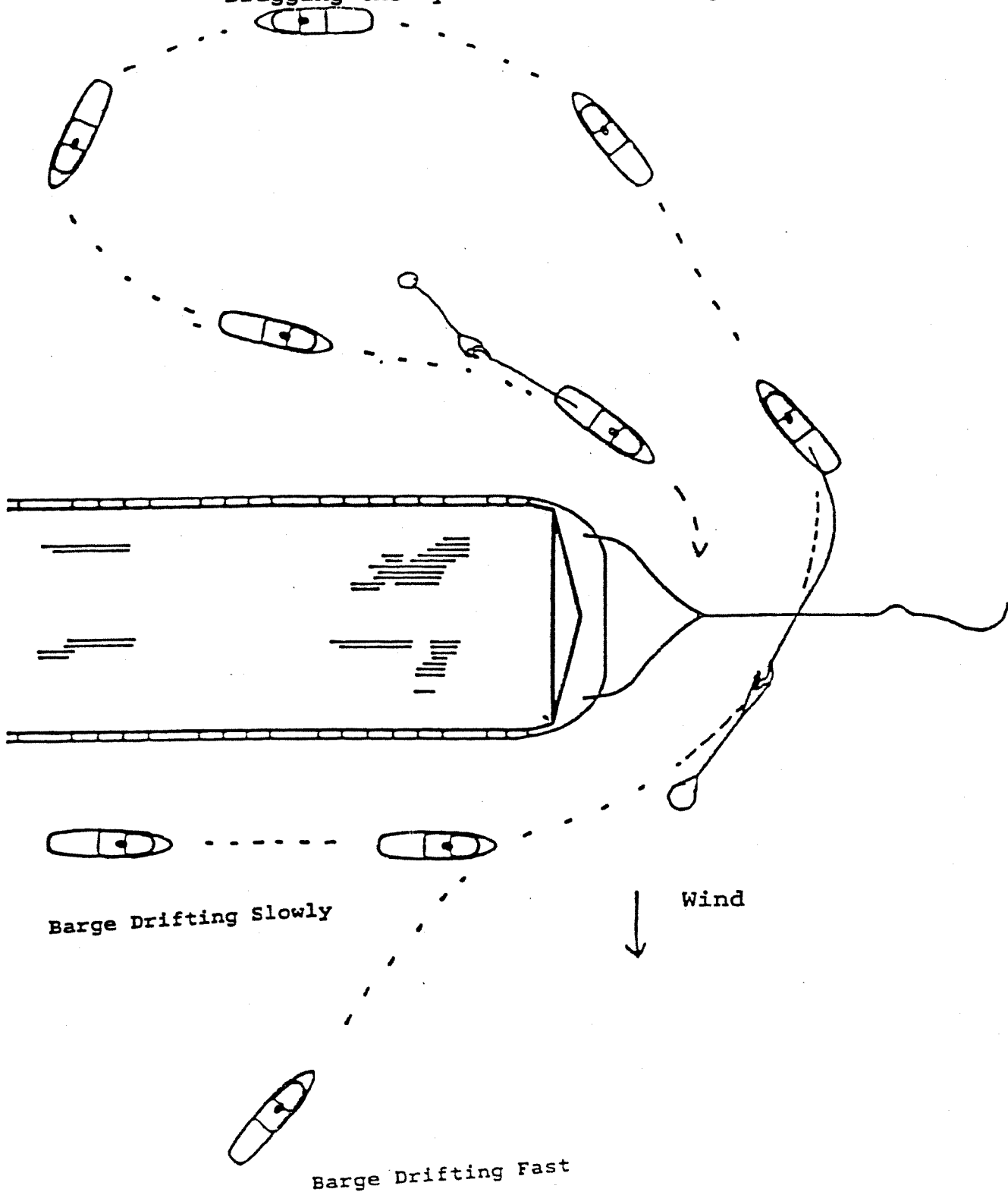
The emergency tow-wire is rigged on the barge with the free end secured down the deck of the barge to the stern. Break away clips are used to secure the wire on the deck. The towing end of the wire is attached to a trailing buoy with a five inch polypropylene floating line. If the towing hawser fails, the towing vessel can pick up the trailing float line, pull the emergency tow line off the barge, and proceed with the tow.

Hook Retrieval Devices:

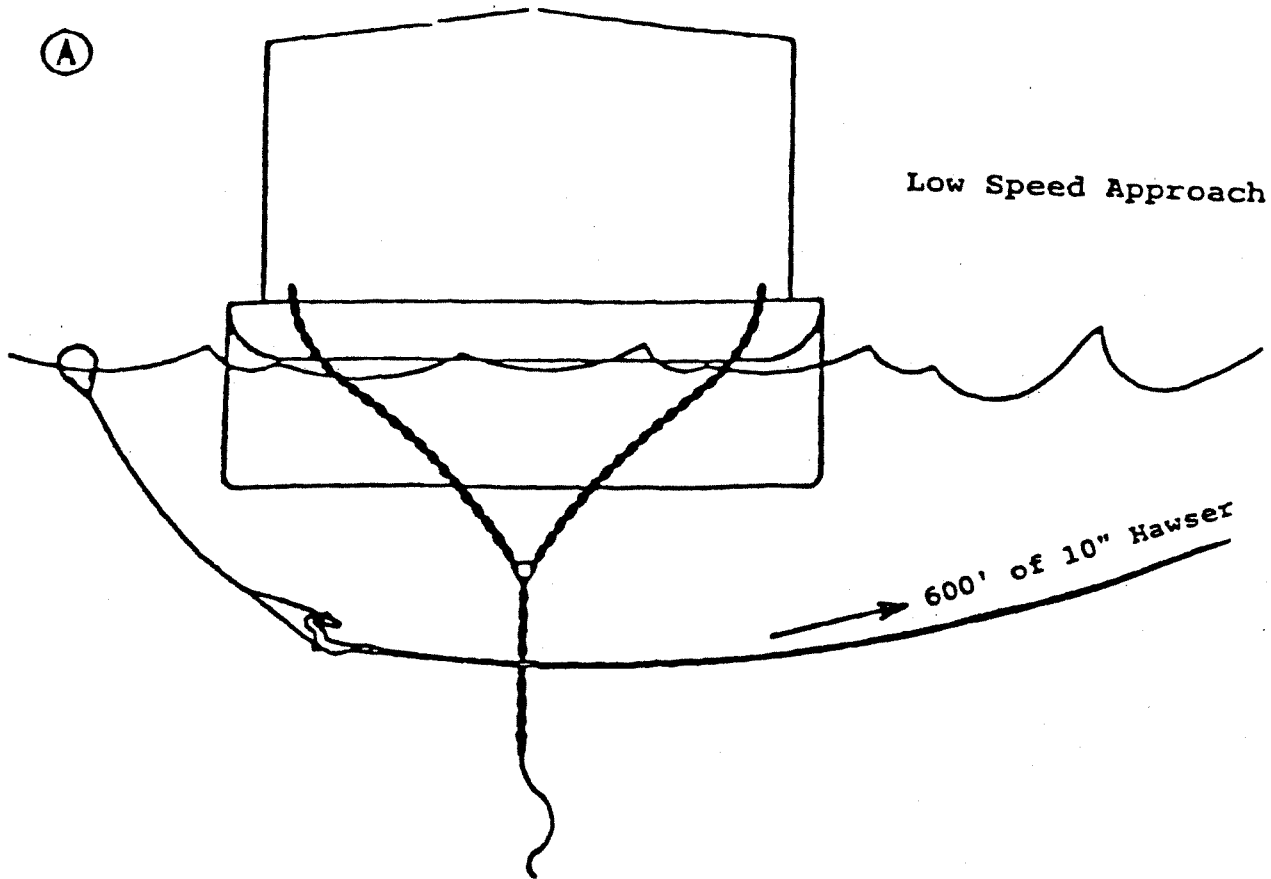
Hook retrieval devices similar to the Orville Hook work like grapple hooks. The hook is slotted so as to lock into the chain leader or bridle and will not slip off. When the leader chain is

picked up, a nylon emergency tow line can then be shackled into the towing vessel's remaining towing wire. Effective use of a hook retrieval device requires training for the tug crew. Figures 1 and 2 show the method of using a hook retrieval device.

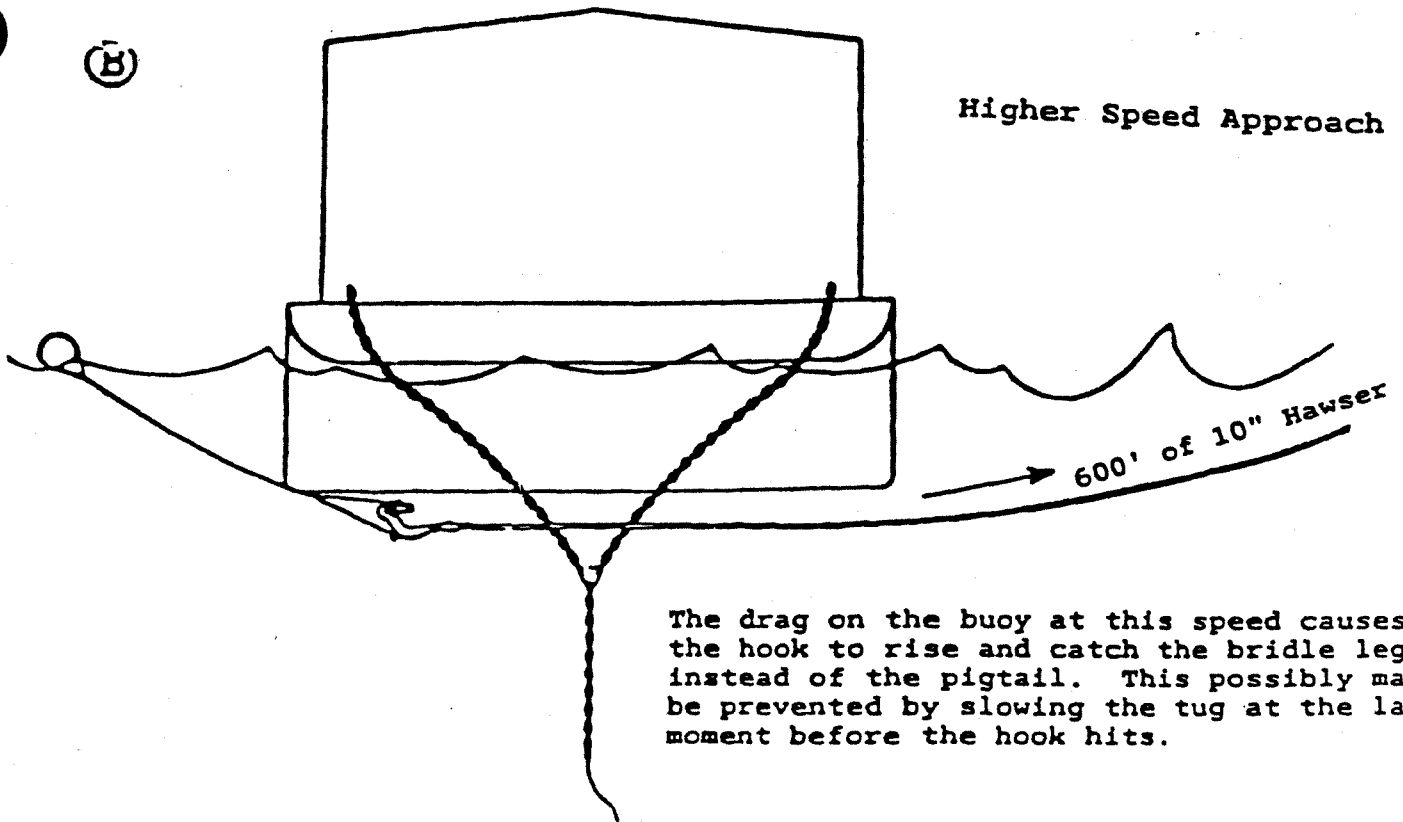
FIGURE 1: Approaching the Barge from either Upwind or Downwind, Dragging the Nylon Across the Surge Chain



(A)



(B)



The drag on the buoy at this speed causes the hook to rise and catch the bridle leg instead of the pigtail. This possibly may be prevented by slowing the tug at the last moment before the hook hits.