

SABOT – TEACHING NOTES

UNIT 2 (TOWING & ALONGSIDE TOWING)

Use magnetic board and magnet models for classroom demonstrations (Unit #1 must be done first)

TERMINAL PERFORMANCE OBJECTIVE for STERN TOW:

2.1 While underway on an Auxiliary facility (in seas under 4 feet) during day and/or night conditions, given a towing scenario, without prompting or the use of references, **DEMONSTRATE**, as a crew, the ability to take a disabled vessel in **stern tow** in accordance with the Boat Crew Seamanship Manual, COMDTINST M16114.5 (series), Auxiliary Boat Crew Qualification Guides COMDTINST M16794.52A, Volume I,(Crew), (Section G) and COMDTINST M16794.53A, Volume II (Coxswain), (Section H) and the SABOT Job Aid.

Tow rig/towing system is defined as the towline, towing pendant, double leg towing bridle, or kicker skiff hook assembly. Opening and closing maneuvers should be conducted with caution and within the limitations of the vessels propulsion system. Approaches may be modified to limit maneuvering corrections based on evaluated risks and environmental conditions.

ENABLING OBJECTIVES:

2.1.1 **CONDUCT** a towing brief including stating the actions the crew will take to mitigate risks in the following areas:

- * Communications.
- * Material condition of the towed vessel.
- * Physical condition and safety of personnel on board.
- * Towing operations of own vessel.
- * Prevailing weather conditions.

2.1.2 **DETERMINE** towing system to be used, based on the distressed vessel's type and assessed risks.

2.1.3 **DEMONSTRATE** assignment of crew responsibilities and inspection of the towing rig.

2.1.4 **DEMONSTRATE** distressed vessel's relative set and drift.

2.1.5 **DEMONSTRATE** approaching distressed vessel with bow into **OR** stern to the prevailing/predominant force (Crossing the "T").

2.1.6 **DEMONSTRATE** station keeping within the maneuvering zone.

2.1.7 **DEMONSTRATE** maintaining optimum position and applying appropriate correcting maneuvers within the maneuvering zone.

2.1.8 **DEMONSTRATE** crew team work to pass heaving line(s) or tow rig to the distressed vessel while in optimum position.

2.1.9 **DEMONSTRATE** directing a crewmember to take a working turn on the tow bitt/cleat and applying proper helm and throttle controls to transition to stern tow and pay out towline.

2.1.10 **DEMONSTRATE** setting initial course and speed and crew teamwork to pay out towline to place the towed vessel in step.

2.1.11 **DEMONSTRATE** crew teamwork to secure the towline to the tow bitt/cleat, and to establish a tow watch.

2.1.12 **DEMONSTRATE** energizing the navigation lights, in accordance with the navigational rules (if applicable or so equipped).

2.1.13 **STATE** the light configuration for a towing vessel under 50 meters in length towing astern less than 200 meters, underway and making way.

2.1.14 **DEMONSTRATE** energizing the sound signals, in accordance with the navigational rules (if applicable).

2.1.15 **STATE** the sound signals given for the towing vessel and the towed vessel (if required).

2.1.16 **DEMONSTRATE** maintaining a safe towing speed.

2.1.17 **DEMONSTRATE** maintaining positive control of the tow and towline, by reducing speed incrementally until all headway from the disabled vessel is removed...

2.1.18 **DEMONSTRATE** correcting maneuvers to keep towline away from the screws while backing to shorten tow to recover towline, place disabled vessel in short tow or alongside tow.

TERMINAL PERFORMANCE OBJECTIVES for an ALONGSIDE TOW:

- 2.2 While underway on an Auxiliary facility (in seas less than 1 foot) in day and/or night conditions, given a towing scenario, without prompting or the use of references, **DEMONSTRATE**, as a crew, the ability to take a disabled vessel in **alongside tow** from a stern tow and moor it to a pier or dock in accordance with the Boat Crew Seamanship Manual, COMSTINST M16114.5 (series), Auxiliary Boat Crew Qualification Guides, COMDTINST M16794.52A , Volume I (Section G and COMDTINST M16794.53A, Volume II (Section H) and the SABOT Job Aid.

Tow rig/towing system is defined as towline, towing pendant, double leg towing bridle, or kicker skiff hook assembly. Opening and closing maneuvers should be conducted with caution and within the limitations of the vessels propulsion system. Approaches may be modified to limit maneuvering corrections based on evaluated risks and environmental conditions.

Boat crews may employ the 1-2-GO nor the 1-4-2-GO or the 1-4-2-3-GO alongside tow method. The towline can be disconnected from the distressed vessel once the coxswain maneuvers and maintains station in the optimum position; or, the towline may remain connected to the disabled vessel and used as line one for the alongside tow. Both methods should be mastered.

ENABLING OBJECTIVES:

2.2.1 **CONDUCT** a tow brief, including stating the actions the crew will take to mitigate risks in the following areas:

- * Transition to alongside tow.
- * Alongside tow method to be utilized.
- * Safety of personnel onboard both vessels.

2.2.2 **DETERMINE** the alongside tow method to be used, based on disabled vessel's type and assessed risks:

- * Using the towline as the number one line.
- * Making a free approach.

2.2.3 **DEMONSTRATE** assignment of crew responsibilities and inspecting alongside lines, proper fender positioning at anticipated contact points.

2.2.4 **DEMONSTRATE** maintaining positive control of the tow and towline, by reducing speed incrementally until all headway from the disabled vessel is removed.

2.2.5 **COORDINATE** to break the tow bitt/cleat and haul in the slack.

2.2.6 **DEMONSTRATE** correcting maneuvers while backing to keep the towline away from the screws.

2.2.7 **DEMONSTRATE** maintaining a maneuvering zone while backing down into the optimum position.

2.2.8 **COMMUNICATE** line command tasking to the crew.

2.2.9 **DEMONSTRATE** contacting both vessels at the fender contact points.

2.2.10 Coxswain **DEMONSTRATES** breaking down to position stern aft of disabled vessel (approximately $\frac{1}{4}$ length of towing vessel).

2.2.11 Coxswain **DIRECTS** the crew with line commands.

2.2.12 **DEMONSTRATE** proper placement and tension adjustment of alongside lines.

2.2.13 **DEMONSTRATE** energizing navigation lights, in accordance with navigational rules (if applicable).

2.2.14 **STATE** the light configuration for a vessel under 50 meters towing alongside in inland and international waters.

2.2.15 **DEMONSTRATE** energizing the sound signals, in accordance with the navigational rules (if applicable).

2.2.16 **STATE** the sound signals given for a vessel under 50 meters, towing alongside.

2.2.17 **DEMONSTRATE** maintaining safe towing speed while maneuvering to a desired course.

2.2.18 **DEMONSTRATE** checking status of the tow.

2.2.19 **DEMONSTRATE** mooring the disabled vessel to a pier or dock using appropriate crew team work and fender placement.

1. Do a complete “RISK ASSESSMENT” before undertaking any towing evolution. Communicate with the towed vessel’s crew who may have important information necessary to complete a successful mission.

DOT LET A PERCEIVED NEED TO ENGAGE IN A TOWING MISSION OVERRIDE A COMPLETE, HONEST RISK ASSESSMENT PROCESS THAT EMPHASIZES PERSONAL SAFETY.

The dynamics of a towing situation continuously change from the time pre-towing preparations begin until mooring at the conclusion of the mission.

Realistic towing training based on standardized techniques, critical analysis, and mission debrief will contribute to risk management and the development of a towing risk management plan.

2. FORCES IN TOWING:

Static Forces:

- a. Inertia: Is the tendency for a vessel at rest to stay at rest. The more the mass a vessel has (the greater its displacement), the more inertia it has and the harder it is to get it moving.
- b. Moment of Inertia: The moment of inertia occurs when a towed vessel resists effort to turn about a vertical axis to change heading. The larger the vessel, the more resistance there will be in turning the vessel. Unless necessary in a case of immediate danger, **DO NOT** attempt to tow a distressed vessel ahead and change its heading at the same time! Overcome the effects of static forces by starting a tow slowly, both on the initial heading or when changing the towed vessel’s heading. Use extreme caution when towing a vessel of equal or greater mass than the assisting vessel. In such situations, the assisting vessel strains the capacity and capability of its equipment, requiring slow and gradual changes.
- c. Apply towing forces on the initial heading to gradually overcome the towed vessel’s inertia.

- d. Apply the towing force perpendicular to the vessel's heading. Once the towed vessel starts to turn, resistance will develop. Apply turning force slowly and gradually.

Dynamic Forces:

- a. Dynamic forces occur once the towed vessel is moving. They are based on the towed vessel's characteristics (shape, displacement, arrangement, and rigging), the motion caused by the towing vessel, and the effects of waves and wind.
- b. Momentum: Once a vessel moves in a straight line, it wants to keep moving in a straight line.
- c. Angular Momentum: Once the vessel's heading begins to change, it wants to keep changing in that same direction.
- d. Frictional Resistance: As a vessel moves, the layer of water in immediate contact with the hull moves too. This due to friction between water molecules, the layers of water close to the hull try to drag along. Frictional resistance also varies with hull shape. Greater underwater (wetted) surface area causes greater frictional resistance.

Frictional resistance will constantly affect the tow, normally keeping some steady tension in the towing rig. Since the shape and wetted surface area of the towed vessel will not change, frictional resistance is managed with towing speed. Higher towing speed causes higher frictional resistance and more strain on the towing rig.

- e. Form Drag: The shape and size of the towed vessel's hull can either help or hinder efforts to move in a straight line, when changing heading, any motion changes in response to waves due to buoyancy. A deep draft, full hulled vessel takes more effort than one with a fine, shallow hull. The towed vessel may be able to help offset form drag by using its rudder.
- f. Wave Making Resistance: A surface wave forms at the bow while the hull moves through the water. The size of the bow wave increases as speed increases, and this bow wave generates resistance to movement of the boat..

It is not always safe to tow a planning hull type of vessel above planning speed. Going from displacement speed to planning speed, or back, can decrease the towed vessel's stability and cause it to capsize. Also, wave drag (even one large wave) could slow the hull down to displacement speed and cause a severe shock load to the towing gear as the towed vessel tries to get back on plane. Shock load or shock loading is the rapid, extreme increase in tension on the towline, which transfers through the tow rig and fittings to both vessels.

- g. Wave Drag: Depends on the normal wetted surface area of the hull and the amount of freeboard exposed to wave action.
 - 1. In large seas be aware that the combination of wave drag and form drag can cause the towed vessel to stop and transfer a large strain to the tow rig damaging vessel fittings, part the towline, and endanger both vessels.
 - 2. In head seas be aware that the towing vessel can only control the effect of wave drag by adjusting the speed and angle that the towed vessel encounters the waves. Limiting vessel speed and towing at an angle to the seas can prevent seas from breaking over the bow of the towed vessel.
 - 3. In following seas, be aware that wave drag can cause the towed vessel to speed up as the crest approaches. Consider increasing tow speed to keep tension in the towing rig when this happens, and then reducing speed as the crest passes.
- h. Spray drag also provides resistance to the tow increasing shock load.
- i. Wind Drag: can cause shock loading and have a bad effect on the towed vessel's motions and stability.
- j. Buoyancy Response and Gravity Effects: Though a distressed vessel may seem stable and sound at rest, its response in tow could be a capsize! A towed vessel's bow may react to an incoming wave by pitching skyward, or by sub-marining. Buoyancy response to following seas could cause the towed vessel to yaw excessively or gravity may cause it to gain speed and surf down the face of a wave. Once making way, a vessel's buoyancy response or the effect of gravity in a seaway may cause severe shock-loading.

Combination of Forces and Shock-Loading:

A boat crew rarely deals with only one force acting on the tow. Shock-loading may cause severe damage to both vessels and overload a tow rig to the point of towline or bridle failure. Shock-loading could also cause momentary loss of directional control by either vessel and could capsize small vessels.

Shock-Loading Prevention or Counteraction:

- a. Reduce towing speed.
- b. Get the vessels in step. When operating near bars and inlets, getting the vessels in step may be impractical due to rapidly changing water depth and bottom contours.
- c. Lengthen the towline. The more line out, the greater the catenary. When tension increases, energy from shock loading is spent on flattening out the catenary before its load is transferred through the rest of the rig and fittings.
- d. Set a course to lessen the effect of the seas.
- e. Deploy a drogue from the towed vessel.
- f. Constantly adjust towing vessel speed to match that of the towed vessel.

Safety demands emphasis on preventing shock-load and reducing its effects. Shock-loading presents a definite possibility of vessel fitting or tow rig failure. One of the more feared possibilities is tow-line snap-back. Think of this as a greatly magnified rubber-band until it breaks. Remember some nylon cordage can stretch up to an additional 40% of its length before parting.

Shock-load can capsize or swamp the towed vessel. The additional towing force from shock-loaded towline could cause a smaller vessel to climb its bow wave and become unstable or it could pull the bow through a cresting wave.

3. TOWING EQUIPMENT:

CAUTION: Do not tow beyond the vessel's limits by simply increasing towline size. If the towline's breaking strength exceeds the limits designed into the vessel's fittings and structure, damage and structural failure may result.

a. Towline: Regularly inspect your towline for:

- cuts
- chaffing
- flattening
- fusing (from overheating from stretching)
- snags (heavy use will compact and harden a towline)

If any of the above, do not use as a towline.

b. Pendants: Use to reduce wear on a towline particularly at eye splices.

c. Bridles: Regularly inspect towing bridles the same as for towlines above.

- * Use a "Y" bridle when both legs can be rigged to exert an equal pull on the hull of a distressed vessel.
- * Use a long bridle when the best attachment points for the towed vessel are well aft to either side of the deck.
- * Keep the legs of the bridle long enough so that the angle of the legs stay less than 30 degrees.
- * The legs must be long enough to reduce towed vessel yaw.
- * Protect bridles with chaffing gear when necessary.

A bridle is also used by towing vessels without centerline towing capability or with transom obstructions. Again, bridle length must be equal to share the strain and the angle should be under 30 degrees.

d. Heaving lines: Should be light and 75 to 100 feet in length. Light cotton clothes line works very well. When using, wet it first. The end should be weighted for throwing purposes but not so hard as to cause damage or injury. It is a good idea to have more than one heaving line so that if the first attempt misses, the second may be deployed while the first is retrieved, etc. Attach a small snap on the standing end of the heaving line for quick attachment to the tow rig.

- e. Drogues: used as a drag behind a vessel to act similar to a parachute to slow it down and provide stability. May also be use while drifting to keep the bow into the seas.

When used the large opening should be toward the vessel from which it is deployed with at least 200 feet of line. A second light line could be used attached to the smaller opening and used for retrieval (Not a required carry item on Auxiliary Facilities.)

- f. Alongside Tow Lines: Should be sets of 4 and of sets of different sizes and long enough to go approximately the length of the tow vessel. Not a bad idea to color coded (Use different colored electrical marking tape) for reference while doing a hook-up.
- g. Dock Lines: Have sufficient dock lines to moor your vessel while you have another vessel in an along-side tow.
- h. Fenders: Have sufficient fenders to properly protect both vessels while in an along-sided tow. Don't forget to have enough fenders for use at the dock when you have a vessel in an along-side tow.
- i. Skiff Hook: A snap hook that attaches to the end of a pole (boat hook) for attaching to the towing eye of small boats that **don't** have any bow cleats or other attachment points. The towing eye is one of the strongest attachment points on a boat but is extremely hard to attach and release.

4. TOWING PROCEDURES

Throughout the entire towing evolution, open communication among the coxswain and crew is absolutely necessary for safety.

- a. Notification: Get as much information as possible/needed before getting underway. Write all information down. Develop a full understanding of the situation. Make a conscious decision to "Accept" or "Not Accept" the mission.
- b. Brief the crew
- c. Evaluate the conditions with the crew.

- d. Navigate to the scene safely. Do not let a sense of urgency affect judgment.

Operate at a safe speed at all times

Keep a constant awareness of position and area hazards

Stay aware of the distressed vessel's position and condition

- e. Communications with the Distressed Vessel:

Keep in radio contact on a regular basis and provide your ETA

Advise POBs on distressed vessel to put on PFDs. **DO NOT ALLOW BA DISTRESSSED VESSEL TO BECOME ENDANGERED WHILE WAITING FOR PEOPLE TO DON PFDs. TAKE IMMEDIATE ACTION TO REMOVE THE PEOPLE OR BOAT FROM DANGER.**

Get details of distressed vessel's deck layout

Ask for any information the D/A feels is important for you to know

Determine if anything has changed

Ascertain any sense of heightened urgency

Inform the D/A that once on scene you will observe conditions and make final preparations before setting up the tow.

- f. Perform On-Scene Assessment:

Evaluate the location and any abnormal conditions of deck fittings

Confirm the number of POBs

Note any unusual conditions that would affect towing, i.e., loose gear, rigging, debris in the water, etc.

Decide if you should place crew on D/A or remove any crew from the D/A

Decide whether to tow or not

Brief both crews of intentions

- g. Determine the approach:

Usually done by crossing the "T" with either your bow or stern into the seas. Most Auxiliary facilities (especially single screw, IN, I/O, or O/B) perform much better stern into the seas. (Members should experiment in moderate seas to determine what works best for them)

(Note: It is much easier for the crew of the Auxiliary vessel to pitch fore and aft than to rock side to side.)

Determine the method of passing the tow rig

Brief the crews of both vessels

- h. Determine the "Danger Zone"
- i. Determine the Maneuvering Zone
- j. Determine the Optimum Position

5. TOWING ASTERN:

- a. Maneuver the towing vessel so the crew can maximize use of the best deck work area on the vessel for passing and working the tow rig. This will provide the opportunity for the most vessel control and visibility for the coxswain, while station keeping a safe distance from the D/A, and providing a safe "Escape Route" in case of an emergency.
- b. In rough seas (**if it works in rough seas it will work in any seas**) make your approach bow into or stern into the prevailing forces. (**NOTE: IF THE SEAS ARE TOO HEAVY AND YOU ARE TAKING ON TOO MUCH SEA WATER OVER YOUR STERN, YOU ARE IN SEAS TOO ROUGH FOR YOUR VESSEL**)
- c. Make the approach at the slowest speed possible while maintaining steerage. Stop in optimum position and pass the towing rig with a heaving line. (The coxswain **MUST** let the crew know before making correcting maneuvers so that they can tend lines and ready themselves..)

- d. Use correcting maneuvers (opening and closing) before a problem develops. (Note: Actual maneuvering techniques will vary from vessel to vessel and are to be mastered by practice and experience. Actual station keeping techniques also vary as the specific wind and sea conditions affect the specific distressed vessel.

(NOTE: Maneuver as required but it is preferable not to make opening and closing maneuvers when lines are over (except the heaving line). Avoid making correcting maneuvers on the face of a wave.

(NOTE: a boat crew's teamwork, communications, and experience are keys to a safe, successful approach)

- e. Passing the tow rig: In calm conditions this may very often be done by simply handing over the tow rig or by using a boat hook. Practice passing the heaving line for moderate or heavy seas (Heavy for the facility).

- * Wet the heaving line before using to make it more flexible and to minimize the risk of tangling.
- * Attach heaving line to tow rig.
- * Take two-thirds of the heaving line coil into the casting hand leaving the remainder in the other.
- * Check that the area is clear of obstructions and people.
- * Advise the coxswain when ready before throwing (Coxswain, I have a shot)
- * Coxswain will direct/give the command to cast.
- * Call out to the D/A "HEADS UP)
- * Cast so the heaving line falls across the D/A's deck.
- * Tell the coxswain when casting.
- * If not successful, retrieve and prepare to throw second line while preparing to throw the second line. Change heaving line attachment onto tow rig.
- * Keep coxswain advised on tow rig transfer:

Tow rig away
Tow rig in the water

6. CONNECTING THE TOW RIG:

Connect to fittings or to “Towing Eye”

(CAUTION: If connecting to Trailer Eye, extreme caution must be exercised to bring the two vessels with reach of the skiff hook pole. Coxswain may decide to back down for the connection or come alongside. Connection should be made and the vessels separated quickly to minimize the danger.)

Connect to Deck Fittings: (Through deck fittings should be checked during pre-tow procedures, **(Do not hesitate to stop the connection if something is wrong.)** If necessary, recover the rig, and transfer a crewmember to the D/A to physically inspect and re-evaluate.

- a. Keep lines in the water so as not to pull boat together.
- b. Watch that the crew of the D/A follow your directions.
 - * Towline clear of any gear on deck (anchor, etc.)
 - Chaffing
 - Under railing
 - Not pulling against railing stanchion.
- c. Have crew of D/A return to cockpit area and be seated.
- d. Slowly open distance between boats and manually adjust length of towline. **(Watch to keep lines out of props!)**
- e. Have your crew take a working turn on bitt/cleat. **(Do not do while there is a strain on the tow-line.)**
- f. After length of towline is set (Maintain a catenary in tow rig) make up line on bitt/cleat. **(Do not do with a strain on the tow-line.)**
- g. Start tow slowly in the heading of D/A if possible.
- h. Set “Tow Watch” and maintain communications with the D/A.. **(You may need to correct helm on D/a or use a drogue)**
- i. Slowly bring tow onto desired course.
- j.. Watch for “YAWING”, or any problems with the tow.

7. ASTERN TOWING:

:

- a. Maintain catenary while towing.
- b. Tow at a safe speed
- b. If yawing:
 - * Straighten helm on D/A
 - * If O/B or I/O try raising or lowering lower unit on D/A
 - * Change scope of tow-line
 - * Adjust trim on D/A (move passengers)
 - * Decrease speed
 - * Change angle into waves and or wind
 - * Deploy a drogue from the D/A

(NEVER TOW AT A SPEED FASTER THAN THE HULL DESIGN SPEED)

See table 17-15 in Boat Crew Seamanship Manual for maximum tow speeds based on D/A length.

8. SHORTENING THE TOW:

- a. Select safe area.
- b. Brief both crews
- c. Determine new tow-line length
- d. Reduce speed and take off way.
- e. Break tow-line from bitt/cleat.
- f. Coxswain backs as necessary as crew keeps line out of screws.
- g. When desired length is achieved make-up tow-line on bitt/cleat
- h. Resume tow in direction of D/A heading

8. ALONGSIDE TOW:

Preparation (Always done in calm protected waters):

- a. Determine side of tow considering:
 - * Side of dockage. (Consider force of wind and current on mooring)
 - * Visibility
 - * Fittings on each vessel
 - * Type of approach: Free approach or use of tow-line as #1 line.
 - * Consider which vessel is larger and thus should be against the dock
- b. Prepare alongside tow-lines and fenders ((You may want to color code lines with colored electrical marking tape) Use largest available fenders.
- c. Placement of fenders to protect both vessels from each other.
- d. Prepare dock lines and fenders for both vessels.
- e. Note direction of wind and current and consider effect on mooring.
- f. Brief crews (**NOTE: Keep hands and limbs out from between vessels**)
(**NOTE: YOU MAY HAVE TO PLACE A CREWMEMBER FORWARD AS A LOOKOUT TO CALL OUT DISTANCE TO THE DOCK AND OTHER OBJECTS**)

Connection:

- a. Always connect the #1 line first.
- b. Connect the #2 line next so that you can start if necessary.
- c. Connect the #3 and #4 lines last. (NOTE: in many cases you can use one line between the towing boats stern cleat on the side of the D/A connected to the D/A's far stern cleat. This will then act as a combination #3 and #4 line)
- d. While going forward tighten up the #3 and #4 lines. Then go in reverse and tighten the #1 and #2 lines.

Mooring:

- a. It is easier to maneuver into the prevailing forces. Moor on the protected (leeward) side of a dock if possible.)
- a. Use only enough speed for steerage.
- b. Use a lookout to call out range and bearing to dock and objects
- c. It is easier to turn toward the towed boat in forward.
- d. To make a sharp turn away from the towed boat consider going into reverse.
- e. Place the larger of the two vessels against the dock if possible.
- f. Secure D/A to dock.
- g. Gather any required information.
- h. Break tow.

9. TOWING PRECAUTIONS:

- a. Have all POBs on D/A don PFDs. Furnish if they don't have enough.
- b. Remove all POBs from a D/A when necessary, safe, or practical.
- c. Cast heaving lines well over a boat's center mass so they drop over the deck.
- d. Establish and maintain clear communications with the D/A. Provide a portable and/or a manual back-up system. Maintain a frequent communications schedule with the D/A.
- e. Have watch monitor condition of tow rig.
- f. Monitor level of water on-board D/A
- g. Monitor condition of POBs on D/A
- h. Keep all clear of the tow rig (Danger of snap-back)
- i. Keep tow rig attachment points as low and close to the centerline as possible.

- j. Do not attach the tow rig to lifeline, stanchions, grab rails, or ladders.
- k. Do not connect the tow rig to cleats or bitts that are attached to the D/A's deck with only screws.
- l. Avoid using lines provided by the D/A.
- m. Avoid using knots to join tow-lines.
- n. Tend a tow-line by hand until secured to a D/A. Then secure it to a cleat/bitt at the coxswain's command. Use two crew if possible to tend the tow-line and work the bitt/cleat.
- o. Do not secure the towline to a bitt/cleat with half hitches. They cause jamming and fusing. Only figure-eight the tow-line W/O use of weather hitches (Half-Hitches) A couple of figure eights will hold indefinitely!
- p. Crew should keep clear of tow-lines. Don't cross arms but changes hands.
- q. **Keep the tow-line clear of propellers, shafts and rudders.**
- r. Use chaffing gear to minimize wear to tow rig.
- s. Avoid towing boats that exceed weight and length limits established by the CG. Rule of thumb: Avoid towing vessels over 50% longer than the tow boat.
- t. Tow at a safe speed for conditions. Prevent shock-loading.
- u. Avoid sudden maneuvers and sharp turns.
- v. Use a drogue to reduce yawing as necessary.
- w. Have someone man the helm of the D/A. Direct them to steer directly at the stern of the tow boat.
- x. Keep a towed boat in trim. Consider the following for trim:
 - * Condition of the D/A (Structural damage, taking on water, etc.)
 - * Structural design of the D/A (low transom, etc.)
 - * cargo
 - * Number and location of POBs.

WARNING: OVERLOAD ASTERN, OR ALONG EITHER SIDE OF A VESSEL'S CENTERLINE, MAY SWAMP OR CAPSIZE A VESSEL IN TOW.

- y. Maintain a diligent towing watch and frequently account for all POBs. (NOTE: A towing watch has a critical responsibility. In addition to the crew member assigned, it is a collateral duty for all other members of the crew.
- z. Ensure that the breaking strength of the bridles in a tow rig are equal to or greater than the breaking strength of the tow-line or appropriately matched to the requirements of the tow and prevailing conditions.
- aa. If possible, load GPS positions and do all chart work at the dock. It is very difficult to do all this while underway and being tossed about.
- ab. If the possibility exists, that a drogue or pump will be required while under tow, pass the equipment before hooking up the tow rig.
- ac. After a tow rig is set up, but before it is connected to a tow, the coxswain should inspect the entire tow rig and hook-up points.
- ad. When approaching a distressed boat, the coxswain should establish an imaginary danger zone around the craft based on prevailing conditions.

10. SINKING TOWS:

When it becomes evident that a tow is about to sink, very quickly assess the situation. Quick decisive action to minimize loss of life is the first priority. Once abandon ship procedures are initiated, radio communications will likely be lost. The primary action is to rescue the people, either from the deck of the towed vessel or from the water.

A sinking tow can pull the stern of the towing vessel under unless all crew members pay close attention to the immediate situation. There will probably not be enough time to disconnect the towline from the towed vessel once it begins to sink.

If a tow begins to sink, stop all towing vessel headway. The force exerted through the tow-line increases the danger of the towed vessel yawing and capsizing.

When it becomes obvious that the sinking cannot be avoided, e.g., the tow has rolled on one side and is not righting itself or the tow's decks are submerging, cut the tow-line or slip the tow-line by braking the bitt/cleat. **(WARNING: DO NOT ATTEMPT BREAKING THE BITT/CLEAT IF THERE IS ANY STRAIN ON THE TOW-LINE. INSTEAD, CUT THE TOW-LINE USING A KNIFE. CUT THE TOW-LINE DIRECTLY BEHIND THE BITT/CLEAT)**

Note the vessel's position by GPS and/or a radar fix and request assistance. Also, mark the wreck with an anchored float. **Once free of the tow rescue any people that were on board.**

(CAUTION: THE TOWING VESSEL COULD BECOME FOULED IN RIGGING OR DEBRIS WHILE ATTEMPTING TO RESCUE SURVIVORS.)

3. TOWING (Stern) EXERCISE #3

See JOB AID, Section H

REQUIREMENTS:

- a. Two facilities, one to be disabled and one as the Response unit.
- b. D/A vessel drifting and anchored in moderate to light seas.
- c. Brief both crews on intended action.
- d. Establish communications between vessels for tow.
- e. Response unit makes approach by crossing the “T” with respect to the predominate conditions (usually wind) and passes the tow rig to the D/A using a heaving line from the optimal position or slightly above if the wind is strong. Use the crossing the “T” approach.
- f. Crew on the Response unit tends the lines away from the screws as the connection is made on the D/A.
- g. After the crew on the D/A returns safely to the cockpit the crew of the Response unit adjust the length of the towline and then securing it to a cleat or bit. (If disabled vessel is anchored, raise the anchor before commencing the tow.)
- h. Response vessel coxswains assigns tow watch duties to a crewmember.

4. TOWING (STERN using a Skiff Hook) EXERCISE #4

See JOB AID, Section H

REQUIREMENTS:

- a. Two facilities, one to be disabled and one as the Response unit. (NOTE: D/A must be equipped with a trailer eye bolt.
- b. D/A drifting or anchored on open waters in moderate to light seas.
- c. Brief both crews on intended action.
- d. Establish communications between vessels for tow.
- e. Response unit does a back-down approach to attach a skiff hook.
- f. After skiff hook is attached the Response Unit moves forward to adjust length of the towline and then secures towline to a cleat or bit. (If disabled vessel is anchored, raise the anchor before commencing the tow.)
- g. Response vessel coxswains assigns tow watch duties to a crewmember.

5. ALONGSIDE TOW EXERCISE #5
(Using tow line as #1 line)

See JOB AID, Section H

REQUIREMENTS:

- a. 2 Facilities, 1 to be disabled and 1 for the Response Unit
- b. D/A vessel in calm and protected waters in a stern tow.
- c. Stop stern tow and brief crews on intended actions.
- d. Fender both vessels, break out boat hook and side tow lines before starting evolution.
- e. Back down on tow while tending line away from the screws. Transfer the towline to the bow of the Response Unit.
- f. Position the D/A in the proper position before attaching the towline the #1 line.
- g. *Connect the #2 line (Alongside tow can start if required)***
- h. Connect #3 and #4 lines.
- i. Caution crews to keep hands out from between vessels.
- j. Tighten all line by going into forward and reverse.
- k. Moor D/A vessel to a dock or pier.

6. ALONGSIDE TOW EXERCISE #6
(Using free approach)

See JOB AID, Section H

REQUIREMENTS:

- a. 2 Facilities, 1 to be disabled and 1 for the Response Unit

(Same as EXERCISE #4 except tow is broken and a free approach is made to connect the alongside tow.)