0702A. Commanders' Duties of Example and Correction

All commanding officers and others in authority in the naval service are required to show in themselves a good example of virtue, honor, patriotism, and subordination; to be vigilant in inspecting the conduct of all persons who are placed under their command; to guard against and suppress all dissolute and immoral practices, and to correct according to the laws and regulations of the Navy, all persons who are guilty of them; and to take all necessary and proper measures, under the laws, regulations, and customs of the naval service, to promote and safeguard the morale, the physical well-being, and the general welfare of the officers and enlisted persons under their command or charge.

1210. Conduct of Persons in the Naval Service.

All persons in the naval service shall show in themselves a good example of subordination, courage, zeal, sobriety, neatness, and attention to duty. They shall aid to the utmost of their ability, and to the extent of their authority, in maintaining good order and discipline, and in all that concerns the efficiency of the command.

0710. Training and Education.

The commanding officer shall:

1. Endeavor to increase the specialized and general professional knowledge of the personnel under his command by the frequent conduct of drills, classes, and instruction, and by the utilization of appropriate fleet and service schools.

2. Encourage and provide assistance and facilities to the personnel under his command who seek to further their education in professional or other subjects.

3. Require those lieutenants (junior grade) and first lieutenants who have less than two years commissioned or warrant service, and all ensigns and second lieutenants:

(a) To comply with the provisions prescribed for their instruction by the Chief of Naval Personnel, the Commandant of the Marine Corps, or the chiefs of other appropriate bureaus.

(b) To keep journals, to attend classes, and to receive appropriate practical instruction, as the commanding officer deems advisable.

4. Detail the officers referred to in paragraph 3 of this article to as many duties successively as practical. This rotation of duties should be completed during the first two years of the officer's commissioned service. The commanding officer shall indicate on the fitness report of each such officer the duties to which he has been assigned, the total period of assignment, and the degree of qualification in such duties.

5. Designate a senior officer or officers to act as advisors to the officers referred to in paragraph 3 of this article. These senior officers shall assist such junior officers to a proper understanding of their responsibilities and duties, and shall endeavor to cultivate in them officer-like qualities, a sense of loyalty and honor, and an appreciation of naval customs and professional ethics.

0709. Welfare of Personnel.

The commanding officer shall:

1. Use all proper means to promote the morale, and to preserve the moral and spiritual well-being of the personnel under his command.

2. Endeavor to maintain a satisfactory state of health and physical fitness in the personnel under his command.

3. Afford an opportunity, with reasonable restrictions as to time and place, for the personnel under his command to make requests, reports or statements to him, and shall insure that they understand the procedures for making such requests, reports, or statements.

4. Insure that noteworthy performance of duty of personnel under his command receive timely and appropriate recognition and that suitable notations are entered in the official records of the individuals.

5. Insure that timely advancement in rating of enlisted personnel is effected in accordance with existing instructions.

0704. Effectiveness for Service.

The commanding officer shall:

1. Exert every effort to maintain his command in a state of maximum effectiveness for war service consistent with the degree of readiness prescribed by proper authority.

2. Report to his appropriate senior any deficiency which appreciably lessens the effectiveness of the command.

3. Report, with his recommendations, to the bureau or office concerned, whenever, in his opinion, his authorized allowances of personnel or material exceed or fall short of requirements.

"DAMN EXEC"

By Lieutenant Commander

STUART D. LANDERSMAN,

U. S. Navy,

Former Executive Officer,

USS STICKELL (DD-888)

The Norfolk wind was streaking the water of Hampton Roads as Commander Martin K. Speaks, U. S. Navy, Commanding Officer of the USS BOWENS (DD-891), stepped from his car, slammed the door, and straightened his cap. As he approached the pier head a sailor stepped from the sentry hut and saluted.

"Good morning, Captain."

"Good morning, Kowalski," answered Commander Speaks. He took pleasure in the fact that he knew the sailor's name. Kowalski was a good sailor. He had served his entire first cruise in the BOWENS and did his work well.

The Captain noticed that over his blues Kowalski wore a deck force foul weather jacket, faded, frayed, dirty, and spotted with red lead. "Little chilly this morning," said the Captain as he walked by. "Yes sir, sure is," replied the sailor with his usual grin.

As the Captain approached his quarterdeck there was the usual scurrying of people and four gongs sounded. "Bowens arriving," spoke the loudspeaker system, and Lieutenant (j.g.) Henry Graven, U. S. Naval Reserve, gunnery officer and the day's command duty officer, came running to the quarterdeck. Salutes and cheerful "good mornings" were exchanged, and the Captain continued to his cabin.

Lieutenant Graven looked over the quarterdeck and frowned. "Let's get this brightwork polished, chief."

"It's already been done once this morning, sir," replied the OOD.

"Well, better do it again. The Exec will have a fit if he sees it this way," said Graven.

"Yes sir," answered the OOD.

As soon as Graven had left, the OOD turned to his messenger, "Go tell the duty boatswain's mate that Mr. Graven wants the brightwork done over again on the quarterdeck."

Later that morning Captain Speaks was going over some charts with the ship's Executive Officer, Lieutenant Commander Steven A. Lassiter, U. S. Navy. The Captain had just finished his coffee and lighted a cigarette. "Steve, I noticed our pier sentry in an odd outfit this morning. He had a foul weather jacket on over his blues; it looked pretty bad."

"Yes sir. Well, it gets cold out there, and these deck force boys have mighty bad looking jackets," the Exec said.

The Captain felt the Exec had missed his point and said, "Oh, I realize they have to wear a jacket, but for a military watch like that, I'd like to see them wear pea coats when it's cold."

Lieutenant Graven was talking with a third class boatswain's mate on the fantail when the quarterdeck messenger found him. When told that the Executive Officer wanted to see him, Graven ended his discussion with, "There, hear that? He probably wants to see me about that brightwork. I don't care how many men it takes to do it, the Exec told me to be sure to get that brightwork polished every morning."

The Executive Officer indicated a chair to Graven and they both lighted up cigarettes. "How's it going these days?" asked the Exec.

Lassiter had always liked Graven, but in the past few months, since he had taken over as senior watch officer, Graven seemed to have more problems than usual.

"Okay, I guess," Graven replied with a forced grin. He knew that things were not as they used to be. It seemed strange, too, because everyone on the ship had been so glad to be rid of the previous senior watch officer, that "damn" Lieutenant Dumphy. The junior officers even had a special little beer bust at the club to celebrate Dumphy's leaving and Graven's "fleeting up" to senior watch officer. Now the Exec was always after him. The junior officers didn't help much either, always complaining about the Exec. Maybe the Exec was taking over as "the heel" now that Dumphy was gone.

"That's good," said the Exec, "here's a little thing that you might look into. These men that stand pier watches have to wear a jacket, but the foul weather jacket doesn't look good for a military watch. I'd like to see them wear their pea coats when its cold." Graven had expected something like this, more of the Exec's picking on him. He responded properly, got up, and left.

Graven told his First Lieutenant: "The Exec says the pier head sentries can't wear foul weather jackets anymore. If it's cold they can wear their pea coats," he added.

"But the pea coats will get dirty and then what about personnel inspections?" asked the First Lieutenant.

"I don't know," Graven shook his head, "but if the Exec wants pea coats, we give him pea coats!"

"Pea coats!" said the chief boatswain's mate, "Who says so?"

"That's what the Exec wants," said the First Lieutenant, "so let's give him pea coats."

"The Exec says pea coats for the pier sentries when it's cold," announced the Chief to his boatswain's mates.

A third class boatswain's mate walked away from the group with a buddy, turned and said, "That Damn Exec, first I got to have all my men polish brightwork on the quarterdeck, now they got to wear pea coats on sentry duty'stead of foul weather jackets!"

Seaman Kowalski's relief showed up at the sentry booth at 1150. "Roast beef today," constituted the relieving ceremony.

"Good, I like roast beef," was the reply. "Hey, how come the pea coat?"

"Damn Exec's idea," said the relief. "We can't wear foul weather gear no more out here, only pea coats."

"Damn Exec," agreed Kowalski, "Captain didn't say nothin' when he came by."

"The Captain's okay, it's just that Damn Exec. He's the guy who fouls up everything," complained the new sentry.

Seaman Kowalski had just gone aboard the ship when Captain Speaks stepped out on deck to look over his ship. The quarterdeck awning shielded the Captain from the view of those on the quarterdeck, but he could clearly hear the conversation.

"Roast beef today, Ski."

"Yeah, I know, and we wear pea coats from now on."

"Whaddaya mean, pea coats?"

"Yeah, pea coats on the pier, Damn Exec says no more foul weather jackets."

"Well that ain't all, we got to polish this here brightwork 'til it shines every morning before quarters, Damn Exec says that too."

"Damn Exec."

Captain Speaks was shocked. "Why 'Damn Exec' from these seamen?" he thought. It was easy to trace what had happened to the order the Captain gave the Executive Officer that morning. It was easy to see that the Executive Officer had passed it along in proper military manner. It was easy to see that the junior officers, leading petty officers, and lower petty officers were passing it along saying "The Exec wants...." That's the way orders are passed along. Why? Because "it is easy."

"All ship's officers assemble in the wardroom," the boatswain's mate announced on the loud speaker system. Lieutenant Commander Lassiter escorted in the Captain. The junior officers took their seats when the Captain was seated. The Executive Officer remained standing. "Gentlemen, the Captain has a few words to say to us today."

The Captain rose and looked around slowly. "Gentlemen, we are continually exposed to words like administration, leadership, management, capabilities, organization, responsibilities, authority, discipline, and cooperation. You use these words every day. You give lectures to your men and use them, but if I were to ask each of you for a definition of any of these words I would get such a wide variety of answers that an expert couldn't tell what word we were defining. Some we probably couldn't define at all. We still use them, and will continue to use them as they are used in the continually mounting number of articles, instructions, and books we must read.

"If I were to ask any of you how can we improve leadership I would get answers filled with these words--undefined and meaningless.

"If we listed all of the nicely worded theories of leadership, studied them, memorized them, and took a test in them, we would all pass. But this would not improve our ability as leaders one bit. I can tell a story, containing none of these meaningless words that <u>will</u> improve your leadership.

"In 1943, I was secondary battery officer in a cruiser in the South Pacific. In my second battle, gun control was hit and I lost communications with everyone except my 5-inch mounts. I could see that the after main battery turret was badly damaged and two enemy destroyers were closing us from astern. At the time my 5-inch mounts were shooting at airplanes. I ordered my two after 5-inch mounts to use high capacity ammunition and shift targets to the two destroyers closing from astern. 'But Mr. Speaks, we're supposed to handle the air targets; who said to shift targets?' my mount captain asked.

"Those attacking destroyers got a few shots in at us before we beat them off. Maybe those shots found a target and some of my shipmates died. I never found out. There was too much other damage.

"I thought over the battle afterward and realized that this entire situation was my fault, not the mount captain's. I may have been responsible for the death of some of my shipmates because up to that day I always gave orders to my subordinates by attaching the originator's name to it.

"What does that mean? It means that it was the easy thing to do, to say, 'the gunnery officer wants us to shift targets.'

"In this peacetime world you may say that we no longer have this struggle on a life or death basis. Quick response does not mean life or death now, but it might tomorrow, or sometime after we've all been transferred elsewhere and this ship is being fought by people we don't know.

"Whether you're cleaning boilers, standing bridge watch or administering your training program, it's easy to say 'the exec wants' or 'Mr. Jones says.' It's the easy, lazy way; not the right way. You can sometimes discuss or even argue with an order, but when you give it to a subordinate, make him think it is coming from you.

"Giving orders the lazy way is like a drug. Once you start saying 'the ops officer wants' you will find yourself doing it more and more until you can't get a thing done any other way. Your men will pass along orders that way, too, and it will become a part of your organization right down to the lowest level. When some problem arises and you want action, you'll get 'who wants this' or 'why should we.'

"Each of you ask yourself if you have given an order today or yesterday in the lazy manner. I think almost all of us have. Now ask yourself if that order really originated with the person who gave it to you, or did they receive it from a higher level? We never really know, do we, but why should we even care?

"In almost every unit the 'lazy' ordering starts on a particular level. From personal experience I can tell you that this can be an exact measure of the unit's effectiveness. If it starts at the department head level or higher it's a relatively bad outfit, and if it starts at the chief's level it's a relatively good outfit. You can find the level below which it starts by hearing a new title preceding a primary billet. 'Damn Exec' means that the executive officer is the lowest level giving orders properly. 'Damn division officer' means that the division officers are taking the responsibility for the order.

"Here I am using some of those words, responsibility and authority, those undefined terms we want to avoid, but perhaps we have helped define them.

"To be more specific, every officer does some 'lazy' ordering, but we need to do it less and less. We must try to push the 'damn' title down as far as it will go.

"Let's push the 'damn officer' down all the way to the chiefs and below, then we will have a Damn Good Ship."

"DAMN EXEC" is an excellent article illustrating the importance of assumming delegated responsibilities at all levels in the chain of command and of giving orders in your own name--not in the name of your superior. In other words, don't pass the buck!

CHAPTER 5

EMERGENCY SEAMANSHIP - For Deck Personnel (Lesson Plan)

Section 5.1

HIGHLINE TRANSFER

I. OBJECTIVES.

A. To stress the importance of highline transfer in replenishment and mercy missions.

B. To familiarize deck personnel with highline equipment.

C. To acquaint personnel with highline transfer procedures.

D. To outline safety precautions required during highline transfer operations.

II. MATERIAL.

A. References.

1. Replenishment at Sea - NWP 38 (effective edition).

2. MSTS Highline Transfer Bill - Section 1.11.

B. Training Aids.

1. Film, MN-10037, Replenishment at Sea - Part A, Basic Elements, 22 minutes, color and sound; Part B, Standard Methods, 22 minutes, color and sound.

2. Illustrations. Refer to illustrations herein and in NWP 38.

3. MSTS Technical Film Report 1-61, MSTS Tankers Replenishing Fleet Oilers at Sea, 15 minutes, color and sound.

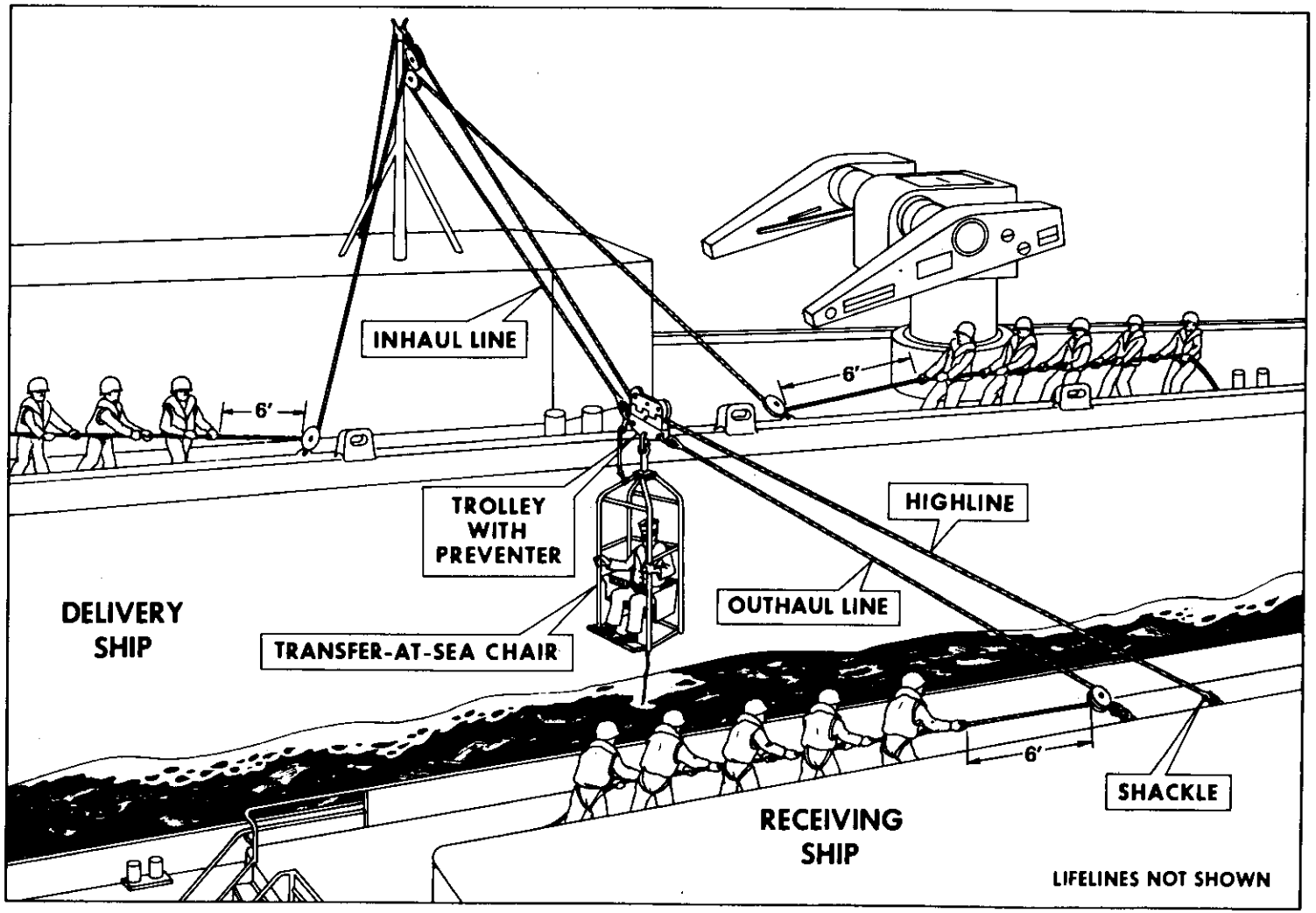
III. INTRODUCTION.

A. Introduce self and subject; define the term "Highline Transfer."

B. State Objectives.

C. Outline Scope:

1. Gear used in highline transfer operations.
2. Procedures for coming alongside.
3. Station keeping.
4. Rigging for passing the gear.
5. Transfer procedures.
6. Retrieving the gear.
7. Communications, hand and light signals.
8. Safety precautions.



Personnel Transfer by Manila Highline

D. Arouse General Interest. MSTS civil-service-manned ships are equipped with naval highline transfer gear and their crews are trained to conduct transfer operations. MSTS ships must be prepared for replenishment-at-sea operations and rescue and mercy missions which require the safe and expeditious transfer of personnel, mail, or stores. The ability of a naval ship to remain at sea when required depends on the capability of the ship's crew to accomplish these transfers rapidly, skillfully, and safely.

E. Develop Personal Interest. Who can tell? You may be the one whose life and health may be preserved as a result of a highline ship-to-ship transfer. In such a case, you would be deeply concerned regarding the ability of the ship's crew to accomplish the transfer safely and quickly. Regardless of your assignment in the highline transfer operations, you will be a vital member of a team on whose actions life may depend. Be sure that you can do your job right!

IV. PRESENTATION.

A. Terms. The terms, "delivery ship" or "control ship" and "receiving ship" or "approach ship" will be used throughout. MSTS ships may serve as either the "delivery" or "receiving" ship and should be prepared to furnish the transfer gear as delivery ship.

1. The delivery ship is normally the control ship, maintains a steady course and speed, and furnishes the transfer gear (except for the phone/distance line).

2. The receiving ship makes the approach, furnishes the phone/distance line, maintains station alongside the delivery ship until stores or personnel have been transferred, then clears away from the delivery ship.

B. Gear. While wire highlines are used for fueling-at-sea and general transfers of stores, only manila highline may be used for personnel transfers. Nylon is not authorized for personnel transfer because of its slickness, elasticity, and bounce. Highline transfer gear consists of the following:

1. At least 350 feet of five-inch manila line. (Three-inch manila line may be used if the ship does not have the capability to handle the five-inch line.) Three-inch line is suitable for a 300-pound maximum load and five-inch manila line for a 600-pound load. The five-inch manila line is generally used as the highline, providing a track for the trolley block which is hauled back and forth to transfer personnel or stores.

2. Shackle. A 5/8-inch (or larger) shackle is used to secure the attachment end of the highline to the receiving ship's padeye. While a pelican hook is used in other highline transfers, only this shackle is to be used in personnel transfers.

3. Trolley Block. The trolley consists of a double sheave snatch block that rides the highline with either the transfer-at-sea chair, Stokes litter, or freight bag suspended from it. The trolley block is painted with white enamel for ready identification and better visibility in night transfers.

4. Outhaul Line. 350 feet of 1½-inch manila line is used for the * outhaul line. It has a thimble on one end for shackling to the trolley block (receiving ship side). The outhaul line is used to haul the transfer-at-sea chair, freight bag, or litter from the delivering ship to the receiving ship.

5. Inhaul Line. 350 feet of 1½-inch manila line is used for the * inhaul line. It has a thimble on one end for shackling to the trolley block (delivery ship side). The inhaul line is used to haul the transfer-at-sea chair, litter, or freight bag back from the receiving ship to the delivery ship.

6. Messenger Line. This is a light line used to haul the heavier lines across. The shot line is passed first and is secured to the messenger line. To avoid excessive strain on the shot line and for ease in handling, the messenger line should be at least 150 feet long. It is usually 180 feet long and of 21-thread * manila. Other lines such as the station-to-station phone line lead messenger, bridge-to-bridge phone/distance line lead messenger, etc., are attached to this main messenger. These lines are attached at least 150 feet from the smaller end of the main messenger.

a. Replenishment at sea messengers are made up as follows: 800 feet of continuous graduated manila consisting of 150 feet of 12 thread, 150 feet of 21 thread, 150 feet of 2½-inch line, and 150 feet of 3-inch line. In making up this messenger, tapered splices are used to ensure ease of reeving through blocks. The large end should be fitted with a thimble and 7/8" screw pin shackle. Of course, this heavy messenger is not required to pass the manila highline.

7. Heaving Lines. Line-throwing guns or bolos are used to pass shot lines between ships. These lines are sent across by the delivery ship. The bolo is preferred for passing the shot line in daylight and should be used when practicable. It consists of about two ounces of lead with rounded corners, well padded and encased in rubber or leather, and attached to the end of a nylon shot line. A two-inch toggle is secured to the line about four or five feet from the weight. To use the bolo, a man grasps the toggle and twirls the weight about his head several times to gain momentum before letting go. An extra bolo with shot line should be available in case the first heave misses. Regular heaving lines are used as standby lines for recovering personnel in the event of a highline failure and for bending on between the shot line and the messenger. A line throwing gun should also be available for use if needed. It fires a .45 caliber buoyant, illuminated projectile.

8. Line-throwing Guns. Two line-throwing guns are required, one as a standby. To insure readiness, the guns should be tested by firing a blank cartridge before use. Because the line-throwing gun is dangerous, only the shoulder .45 caliber gun, with buoyant, illuminated projectiles, is to be used. While the bolo is preferred for daytime use, the line-throwing gun is generally best at night.

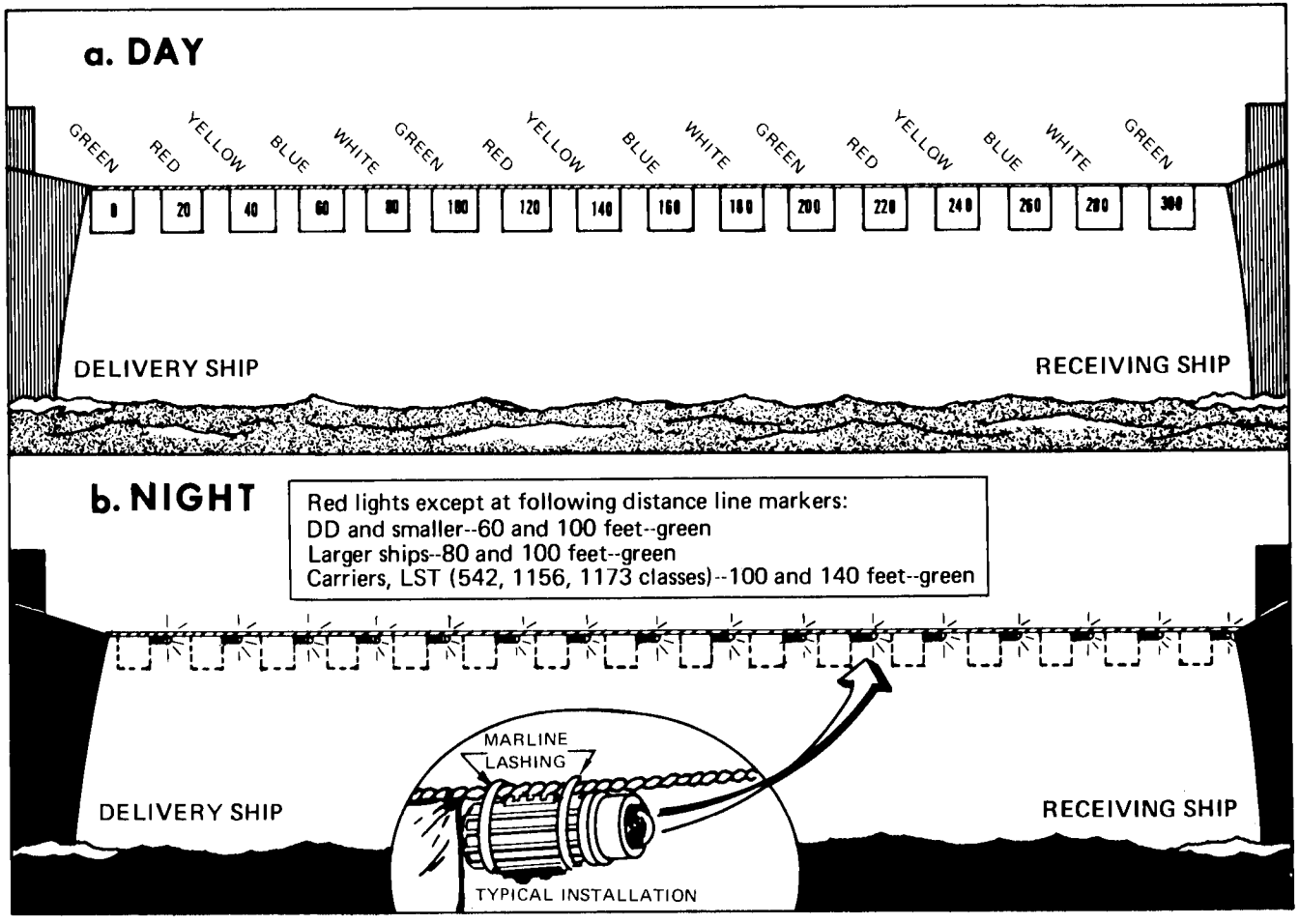
9. Bridge-to-Bridge Sound-Powered Phone/Distance Line Combination. This combination serves as a means of communication and to indicate distance between ships. It is passed to the delivery ship from the receiving ship via a special distance line messenger. The phone/distance line combination consists of:

a. 300 Feet of 1½-inch manila line married to 300 feet of two-conducter telephone wire.

b. Markings. The distance line carries 8 x 10 inch painted canvas daytime markers or colored buntings, spaced 20 feet apart, with the distance markings in five-inch numerals or red flashlights at night, as shown in the illustration herein.

c. Sound-powered telephones. Sound-powered telephones (paralled by hand signals) are the primary means of communications when alongside, because of the minimal amount of noise. Two-conductor telephone cables with double male jack-boxes on each end are used. The jack-boxes are secured tightly and made watertight by wrapping them in plastic bags. Telephone lines must be hand-tended on the receiving ship. Talkers on inter-ship lines should not wear neck straps in order to prevent injuries resulting from rapid surging of the ships while alongside.

d. Station-to-station sound-powered phones. USNS ships conducting highline transfers with commissioned ships should be prepared to receive a station-to-station telephone cable for use in addition to the bridge-to-bridge line. The bridge-to-bridge line is on the phone/distance line combination. Where the line is tended at some distance from the bridge, there should be a telephone link between the transfer station and the bridge.



Phone/Distance Line Markings

10. Helmets and Jackets. The line-throwing gunner or bolo heaver will wear a red safety helmet and red life jacket, jersey or vest. The signalman will wear a green safety helmet and green life jacket, jersey or vest and will use prescribed hand signals to parallel orders passed over the sound-powered phones. All other topside personnel engaged in transfer operations shall wear international orange life jackets and orange safety helmets.

11. Station Markers. By day a three-foot square green bunting centered with a white letter "P" or painted canvas is draped over the rails of both ships to indicate the location where the gear is to be passed for the transfer of stores or personnel. Other colored station markers are used for various commodities, as red for fuel oil, and a red light station marker light box is used by night as specified in the effective edition of NWP 38. Replenishment ships may have the various transfer station areas painted the appropriate color.

12. Hand Signals. Colored flags or paddles are used by day and colored flashlights or wands are used at night. Hand-flag and light signals must be used at all times at transfer stations to parallel orders passed over the sound-powered phones. (See Figure, Replenishment Operation Signals, page 5-16.)

13. Bridle. A bridle was formerly used to send over the highline, hauling line, and distance line at one time. It is no longer used since the receiving ship now furnishes the phone/distance line and because the three lines would occasionally foul. Where MSTS ships are equipped with the bridle, it may be used to send over all three lines at one time in transfers with other MSTS or merchant ships. It will not be used in transfers with USS ships.

14. Electric Megaphones. Portable electric megaphones serve as the primary standby or emergency means of communication. The megaphones must be tested before each operation, be available on the bridge, and should not be used as a matter of routine. They are used during the approach and until the telephone lines are connected. Bridge voice radio circuits may be used during an emergency as a secondary means of communications.

* 15. Fenders. Large fenders should be rigged on the delivery and receiving ships, suspended at three or more vital points along the engaged side. Fender suspension lines and fore and aft preventers shall be of at least 3-inch line.

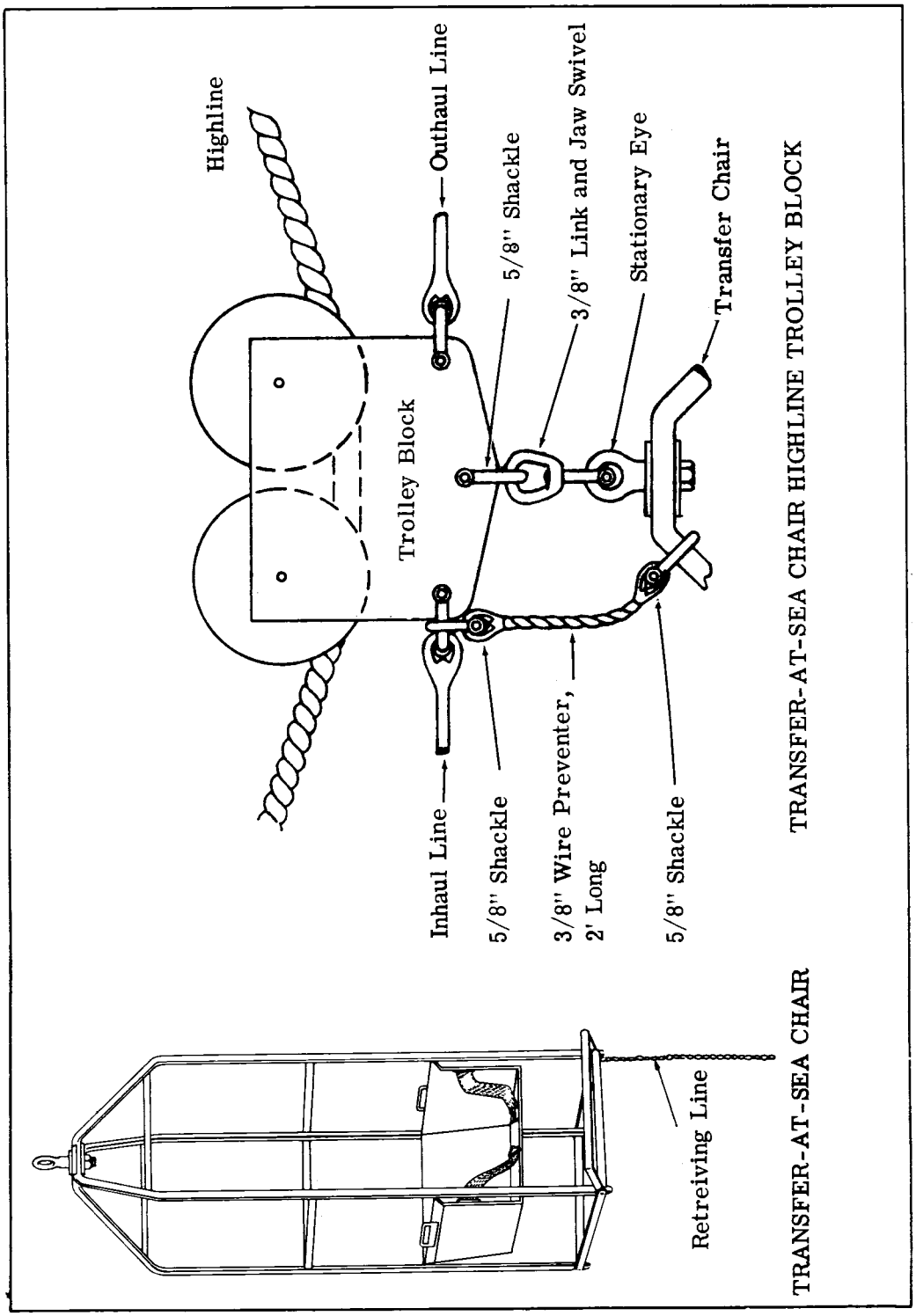
16. Snatch Blocks. Snatch blocks are used to provide fairleads for the outhaul and inhaul lines and for the highline, if necessary.

17. Transfer-at-Sea Chair. The transfer-at-sea chair is used to transfer personnel other than stretcher cases and is provided with a quick-acting safety belt. It is rigged to the trolley block with a 5/8-inch or larger shackle and with a 3/8-inch 2-feet long wire preventer as shown in the illustration.

a. Only one person may be transferred at a time when using the three-inch manila highline. A single chair transfer method is the one normally used; however, a double-chair transfer may also be made under good conditions. For transferring two men simultaneously, a five-inch manila highline and two trolley blocks
* are used, with each chair hung off from a separate block. The two blocks are shackled together at their attachment points for the inhaul and outhaul lines and the two chairs are bolted or lashed together side by side (not back-to-back), to swing as a unit.

b. Handling lines should be shackled to the trolley block and to the transfer chair to aid in their control on deck. These should be of $2\frac{1}{2}$-inch manila, nine feet long.

* 18. Stokes Litter. The Stokes litter is used to transfer sick or injured personnel. It is fitted with a protective frame secured above the litter to keep the trolley block from falling onto the patient if the highline parts. Flotation bags are rigged to protect the patient from injury in case of highline failure or accidental submergence, four for the litter and one for the trolley block. (See Article VII and illustration.) While NWP 38 (effective edition) specifies canvas flotation bags, these are bulky and uncomfortable. Therefore, NAVSHIPS has agreed that orange-colored nylon flotation bags may be used to provide the same amount of buoyancy with less bulk. Tending lines of $2\frac{1}{2}$-inch manila, two fathoms long, are attached to the head and foot of the litter to assist in handling on deck.



Equipment for Personnel Transfer

19. Tools. Each transfer station must be equipped with the following tools for use in emergency breakaway, rigging, and unrigging:

(a) Axe.

(b) Hammer, ball peen.

(c) Wrench, 12-inch crescent.

(d) Marlinspike.

(e) Pliers, 8-inch gas and 6-inch side-cutter.

(f) Bolt cutters, 36-inch.

(g) Seizing wire.

(h) Cotter keys, assorted.

(i) Knife for each man on station. (Deck seaman provide their own knives.)

C. Color Identification. Maintain color identification of all highline gear by painting with white enamel all padeyes, pelican hooks, links, trolley blocks, and snatch blocks used with the highline and hauling lines. The trolley block is painted with white enamel for better visibility during night transfers. The emergency breakaway tools and toolbox should also be painted with white enamel and identified.

D. Procedures for Coming Alongside.

1. Control Procedure.

(a) During highline transfer operations, the delivery ship is the control ship. She holds steady on course and speed, furnishes and handles the rigs and passes the shot line.

(b) The receiving ship is the approach ship, furnishes and handles the phone/distance line, maintains station alongside until stores or personnel are transferred, and clears away from the delivery ship.

2. Course to steer during transfer. Courses are selected in relation to the wind and sea, and also the size and types of ships involved. Good seamanship will dictate the best course to steer.

3. Speed During the Transfer.

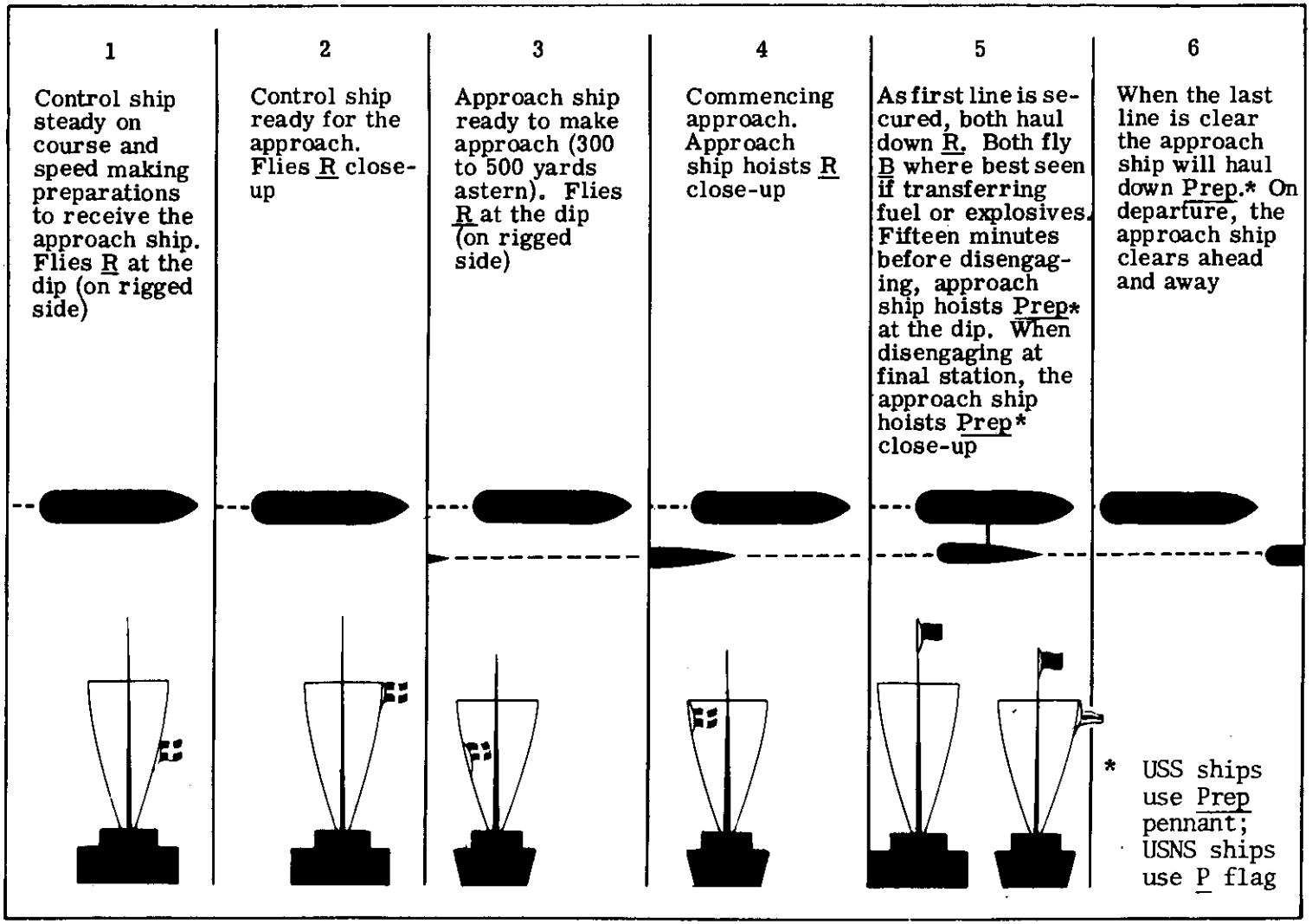
(a) Generally it is advisable to conduct highline transfer operations while cruising at speeds between 10 and 15 knots. However, weather conditions influence the choice of speed just as they do in determining the course. Sufficient speed must be used to maintain steering control.

(b) Speeds of less than eight knots are not advisable because steering control is greatly diminished due to reduced rudder effect.

(c) Speeds higher than 15 knots may be used if weather permits, but because of mutual attraction of ships at high speeds, care must be taken to maintain maximum distances. This also applies to ships operating in shallow water of less than 20 fathoms.

(d) Orders for change of engine speed should be given in number of revolutions.

4. Making the Approach. (See illustration "Approach, Riding Alongside, and Departure.")



Approach, Riding Alongside, and Departure

(a) When steady on course and speed, the delivery (control) ship will hoist the signal flag ROMEO at the dip on the side rigged.

(b) When ready for the receiving ship to approach, the delivery ship will haul the signal flag ROMEO close-up.

(c) The receiving (approach) ship, having taken station 300 to 500 yards astern of the delivery ship, will hoist the signal flag ROMEO at the dip on the side rigged when ready to come alongside.

(d) The receiving ship will haul ROMEO close-up when commencing her approach. An approach speed of three to five knots greater than the delivery ship is used, gradually slowing so as to be moving at the delivery ship's speed when in position alongside.

(e) The signal flag YANKEE is used, as above, if the transfer involves light freight only.

(f) The delivery ship will toss the bolo over or fire the shot line as soon as practicable and will send over the messenger lines and the station-to-station sound-powered phone line. The receiving ship will pass the distance line with attached sound-powered bridge-to-bridge phone line.

(g) When the ships are in proper relative position, the highline transfer rig is passed by the delivery ship and hooked up on the receiving ship.

(h) Both ships haul down the signal flag ROMEO as soon as the first line is secured.

(i) For manila highline transfers, the forward transfer station of the receiving ship should be abreast of the control ship's after station.

(j) Transfer operations in ice fields can be accomplished only with both ships stopped, and lying as close alongside as possible. To accomplish this, a polynya (an open water lake within the ice field) should be found if possible. If a polynya cannot be found, the transfer must be carried out in the ice pack. The greatest hazard in approaching another ship while in the ice pack lies in the danger that pressure generated by the approaching ship will force intervening ice blocks through the hull of one or the other (or both) of the ships, or will damage the rudder and screws of the ship approached. For that reason, a bow to bow approach (Chinese landing) is generally the safest for mooring alongside in ice.

5. Station-keeping. Maintaining station alongside the control ship requires precise manuevering by the receiving ship.

(a) A distance of 60 to 80 feet between ships should be maintained during station-keeping, depending upon wind and sea conditions. Large ships may open up to 120 feet, with a maximum of 180 feet when the ships are yawing excessively in heavy weather or at higher speeds.

(b) Steaming too close restricts manuevering ability, and steaming too far apart puts an undue strain on the rigs.

(c) Variation in the velocity of water flow around the hull of a ship underway creates areas of increased pressure (suction) amidships. When two ships are close to each other underway, these areas take on added importance because of the inter-mingling of pressure areas. Effects vary with the distance between ships, size and shape of hulls, speed, and depth of water.

(d) The best position for ships of about the same size close aboard is exactly abeam. If the receiving ship is considerably smaller than the delivery ship, her best position is in the area between the bow and stern pressure areas.

(e) A small amount of rudder is usually necessary in order to maintain station while alongside. The amount of rudder will vary with the size and load of both ships, sea and wind conditions, speed, and ship separation. Greater rudder angles are required when ships are closer than 80 feet, and a reduction in speed will occur as a result. This complicates the problem of maintaining station.

(f) It is the responsibility of the receiving ship to make course or speed corrections as necessary.

(g) Close communication and liaison must be maintained between the two ships' conning officers. Bridge-to-bridge telephones are essential for this purpose.

6. Departure of the Receiving Ship.

(a) Fifteen minutes before estimated disengagement, the receiving ship will hoist the signal flag PAPA at the dip on the outboard yardarm. (Commissioned ships use the PREP pennant.)

(b) When disengaging, the signal flag PAPA will be hoisted close-up.

(c) When the last line is clear, the receiving ship will haul down the signal flag PAPA. She will increase speed moderately (3 to 5 knots) and clear away ahead, directing her course outboard in small steps. Radical changes in course and speed must be avoided.

7. Emergency Breakaway. An emergency breakaway is simply an accelerated standard breakaway using an orderly and prearranged procedure. The objective is to disengage quickly, without damaging the rig or endangering personnel. Either ship may initiate an emergency breakaway. A casualty to the gyro compass, a steering casualty, or loss of power may result in a collision between two ships, so a well prepared plan of action should include the following:

(a) Alert the ship alongside. Sound-powered phones and hand signals should be the primary means for ordering an emergency breakaway because of the minimal amount of noise generated. However, electric megaphones, voice radio, and visual signals may also be used. The danger signal on the ship's whistle should be sounded to alert all ships in the vicinity.

(b) Inform the ship alongside, by any of the communication or signaling methods, of the reason for the casualty and the necessity for emergency breakaway.

(c) When orders for an emergency breakaway are received at the transfer station, the following hand and light signals are used to indicate readiness and for execution:

(1) A red flag or paddle is rotated in a semicircular arc from one side of the body overhead to the other side of the body. Both the starting and answering signals signify that the station is in all respects ready to execute the emergency breakaway. With both stations ready, the signal is executed by dropping the signaling hand from the overhead position.

(2) By night a red light is used. The method of signaling and executing is the same as for the above day signal.

(d) Commence breakaway procedures:

(1) The delivery ship retrieves the highline trolley block as soon as possible and then the highline. If the receiving ship cannot unshackle the highline, she may cut the highline at the splice and allow it and the outhaul to run over the side.

(2) The signal flag PAPA must be used. (The PREP pennant is used in commissioned ships.)

(3) Both ships should take steps to avoid collision. When all lines are released, both ships maneuver as appropriate to get clear.

e. If a collision should occur, it is essential that measures for controlling damage and maintaining watertight integrity be initiated immediately.

E. Rigging for Passing the Gear.

1. Delivery Ship. The delivery ship furnishes the gear (except for the phone/distance line) and is responsible for the good condition of all the equipment and fittings, particularly inspecting the highline before each transfer for evidence of rot, broken inner strands, cuts, or other signs of weakened condition.

a. Two padeyes, one over the other, are welded well up on the ship's structure. (On small ships, padeyes may be welded to collars and bolted to booms.)

b. A snatch block is shackled to each padeye.

c. The inboard end of the highline is rove through the trolley block and upper snatch block. From there it is rove through other fairlead blocks as necessary for hand tending on deck.

d. The other end of the highline, the attachment end, has a 5/8-inch (or up to one-inch) shackle which is attached to the highline padeye on the receiving ship. It is sent over to the receiving ship by messenger line.

e. The inhaul line is attached to the delivery ship's side of the trolley block and then is rove through the snatch block on the lower padeye. From this point it is led through fairleads as necessary for hand-tending on deck.

f. One end of the outhaul line is shackled to the outboard side of the trolley block and the other end is readied to be sent over to the receiving ship by messenger.

g. The phone/distance line is furnished by the receiving ship and is sent over to the delivery ship on a special distance line messenger attached to the first rig messenger. The zero end is secured to the rail of the delivery ship. Where the transfer station is some distance from the bridge, sound-powered phones or walkie-talkies may be used for communications.

h. Large fenders are suspended at three or more vital points on the engaged side, hung off from the deck by suspension lines and held in place by fore-and-aft preventers of at least 3-inch line.

i. The shoulder .45 caliber line-throwing gun, with buoyant, illuminated projectile is tested by firing a blank cartridge.

j. Sound-powered phones between bridge and transfer station are tested.

k. A three-foot square green bunting centered with a white letter "P" station marker is rigged at the rail by day or a red light station marker box is rigged by night.

l. All lines are faked down for free running. They must not be coiled.

m. When the receiving ship is in proper position, both ships pass the word over the megaphone and topside loudspeaker system: "Stand by for shot line--all hands take cover."

n. The officer-in-charge of the delivery ship's highline station will sound one blast on a mouth whistle or pass the word "standby" on the electric megaphone.

(o) The officer-in-charge of the receiving ship's highline station, when ready with all hands under cover, will reply with a two-blast signal on the mouth whistle or will pass the word "ready" on the electric megaphone.

(p) After ascertaining that all hands in the vicinity of the receiving ship's highline station are under cover, the officer-in-charge of the highline station on the delivery ship will give the order to toss the bolo with shot line attached over or to fire the shoulder line-throwing gun with buoyant, illuminated projectile at night. THE GUN WILL NOT BE FIRED EXCEPT BY ORDER OF THE OFFICER-IN-CHARGE.

(q) When passing the gear, keep the lines out of the water.

2. Receiving Ship. Little preparation is necessary aboard the receiving ship, except to ready the phone/distance line, station marker, snatch blocks, and to test the sound-powered phones. MSTS ships are fitted with two padeyes, one above the other, for the highline attachment and outhaul line block. For merchant ships, wire straps can be rigged to the mast or boom for securing the highline and outhaul block.

(a) The receiving ship notifies the delivery ship when ready to receive personnel or stores.

(b) Only those men designated by the officer-in-charge will leave cover to retrieve the shot line. No other personnel will leave cover until all shot lines are aboard and the word is passed on the topside loudspeaker system, "shot line secure".

(c) When the shot line is received, it is hauled in until the messenger is aboard. This first rig messenger has a special distance line messenger attached, equipped with a snap hook and ring and a tag marked: "Attach phone/distance line."

(d) The receiving ship unhooks this special distance line messenger, secures the zero end of the phone/distance line to it, and signals the delivery ship to heave it across.

(e) The delivery ship secures the "zero" end of the distance line to its outermost rail. The receiving ship leads the distance line to a position where the distance markers can best be seen by the conning officer. It is then handtended and kept taut at the rail of the receiving ship, at right angles to the ship's centerline. Distance apart is read at the receiving ship's rails. Where the line is some distance from the bridge, there should be a telephone link between the distance line tender and the conning officer.

(1) The distance line is of 1½-inch manila, 300 feet long, with markers to indicate the distance between the two ships. (See illustration, page 5-5.)

(2) Daylight markers are of 8 x 10-inch colored cloth or painted canvas markers spaced 20 feet apart, with five-inch numerals.

(3) Night markers are red-lensed flashlights attached to the line at each day marker from 40 to 120 feet. At night, the distance line tender keeps the conning officer informed of the distance.

(4) The distance line also carries the bridge-to-bridge sound-powered phone line.

(5) Where the transfer station is some distance from the bridge, sound-powered telephone or walkie-talkies may be used for communications.

(f) The attachment end of the highline is hauled across by means of the messenger and is secured to the upper padeye by its 5/8-inch (or up to one-inch) shackle. This establishes the highline connection. The highline is five-inch manila, at least 350 feet long. (It may be a three-inch line if the ship does

not have the capability to handle the five-inch line.) Only manila line may be used. Neither wire nor nylon is authorized for personnel transfer.

(g) The outhaul line is rove through a snatch block shackled to the lower padeye. From there, it is led through fairleads as necessary to keep it clear for hauling.

F. Transfer Procedures. ALL LINES (HIGHLINE, INHAUL AND OUTHAUL LINE) MUST BE TENDED BY HAND WHEN TRANSFERRING PERSONNEL. WINCHES MUST NOT BE USED. As an additional precaution, both ships must have their emergency boats on the unengaged side cleared away, the motors tested, sea painters rigged, and boats swung out ready for use.

1. On the delivery ship, the transfer chair, litter, or freight bag is engaged to the trolley block. A strain is taken on the highline and it is kept taut by a minimum of 25 men.

(a) By taking a strain on the highline they lift the transfer chair or litter clear of the deck and rail.

(b) The strain should be taken by walking the highline down the deck. DO NOT HAUL IT HAND-OVER-HAND.

(c) After the passenger has been seated in the transfer chair and has fastened the quick release belt, the highline is hauled taut to raise the chair and he is ready to be hauled across. Litter transfers are used for patients not capable of sitting up. Tending lines of 2½-inch manila, two fathoms long, are attached to the head and foot of the litter to assist in handling on deck. (See illustrations of litter with protective frame and flotation bags.)

2. The chair or litter is hauled across to the receiving ship by slacking the inhaul line on the delivery ship and hauling on the outhaul line on the receiving ship. The reverse procedure is used to return the load to the delivery ship.

G. Retrieving the Highline Rig.

1. The delivery ship will retrieve the trolley block and chair or litter and will then slack off on the highline.

2. The receiving ship will bend on or stop off the end of the outhaul line to the end of the highline and will then unshackle the highline from its attachment point. The highline is eased over to the delivery ship by means of the messenger line. Care is taken to keep the lines out of the water as slack is taken in by the delivery ship.

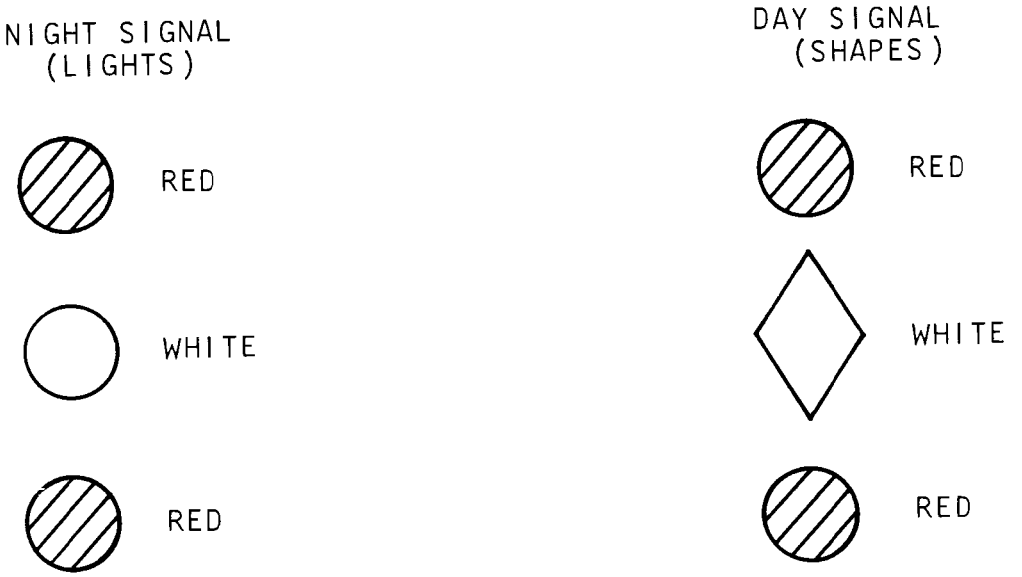
3. The delivery ship will haul in on the lines, leaving them rove through the blocks and fairleads to prevent fouling.

4. The distance line is cast loose from the delivery ship last and the phone/distance line is hauled in by the receiving ship.

5. Lines must be kept clear for emergency breakaway if necessary because of steering casualty, power failure, or other casualty. An emergency breakaway is basically an accelerated standard breakaway on an orderly and prearranged procedure. The objective is to disengage quickly, without damaging the rig or endangering personnel. In an emergency breakaway, the delivery ship will retrieve the highline trolley block as soon as possible. If the receiving ship cannot stop off the highline to the outhaul line, she will cut the highline at the attachment end splice and allow the highline and the outhaul line to run over the side.

* LIGHTS AND SHAPES FOR HIGHLINE TRANSFER

Rule 4 of the International Rules of the Road (CG-169) states that "----vessel engaged in replenishment at sea----shall carry in lieu of the lights prescribed in Rule 2 (a) (i) and (ii) (headlight and sidelights), or Rule 7 (a) (i)(headlight), three lights in a vertical line one over the other so that the upper and lower lights shall be the same distance from, and not less than 6 feet above or below, the middle light. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all-round the horizon at a distance of at least 2 miles. By day, she shall carry in a vertical line one over the other not less than 6 feet apart, where they can best be seen, three shapes each not less than 2 feet in diameter, of which the highest and lowest shall be globular in shape and red in colour, and the middle one diamond in shape and white." Accordingly, for highline transfer at night, show instead of masthead and range lights, the above three all-round lights--red, white, red. In daytime, show the three shapes--the middle one white and diamond shaped; the upper and lower red and globular shaped.



REPLENISHMENT OPERATION SIGNALS

ALONGSIDE--FLAG HOISTS

SIGNAL	MEANING
	APPROACH SHIP
Romeo Displayed on fore yardarm on side rigged	At the dip: Am ready to come alongside Close up: Am commencing approach Hauled down: First line secured
* Prep Displayed at the outboard yardarm	At the dip: Expect to disengage in 15 minutes Close up: Replenishing completed; am disengaging at final station Hauled down: Am clear of delivery ship

* USNS ships use the PAPA flag.

SIGNAL	MEANING
	CONTROL SHIP
Romeo Displayed on fore yardarm on side rigged	At the dip: Am steady on course and speed and am preparing to receive you on side indicated Close up: Am ready for your approach Hauled down: First line secured

	BOTH SHIPS
Bravo	Where best seen: Fuel or explosives are being transferred

ALONGSIDE--HAND SIGNALS
(Paralleled by telephone)

R = Red; G = Green; A = Amber

COMPLETION OF OPERATION

DAY (Paddles/Flags 12" x 12")	NIGHT (Wands)	SIGNAL	MEANING
R G	R G		Replenishment completed Commence unrigging
R G	R G		Pelican hook to be tripped

EMERGENCY BREAKAWAY

DAY (Paddle/Flag 12" x 12")	NIGHT (Wand)	SIGNAL	MEANING
R	R		Prepare for emergency breakaway
R	R		Preparing for breakaway
R	R		Ready for breakaway
R	R		Execute breakaway (initiating ship)

STANDARD PROCEDURES

DAY (Paddle/Flag 12" x 12")	NIGHT (Wand)	SIGNAL	MEANING
R	R		Heave around
R	R		Avast heaving
R	R		Slack off
G	G		Start pumping or delivery
G	G		Stop pumping or delivery
A	A		Blow through
A	A		Stop blow through

5. Have the emergency boats ready for launching if a lifeguard ship is not stationed astern.

6. Do not conduct a transfer at night or in rough weather unless an emergency exists.

7. Personnel being transferred must wear international orange life jackets (except patients in litters with flotation bags). At night they will be furnished a mouth whistle and two waterproof life jacket-type flashlights burning brightly and secured to their life jacket. Personnel being transferred by chair should be instructed to unhook the quick-release belt and get out of the chair if it falls into the water, should the rig fail. Where the water is very cold, immersion suits should be worn.

8. Telephone talkers on intership phone lines should not wear neck straps in order to avoid possible injury when ships surge alongside.

9. To facilitate handling of the transfer chair or litter on deck, $2\frac{1}{2}$-inch manila lines, 9 to 12 feet long, should be secured to the trolley block and to the chair or litter.

10. Should the highline part during transfer of the litter, causing it to fall into the water, the hauling lines must be cast loose, free for running, so that the patient will not be dragged into the vicinity of the screws of either ship.

11. All lines must be kept clear in readiness for emergency breakaway if necessary.

K. Transfer by Helicopter. When helicopters are available, they should be used. They avoid the need for and the hazard in ships going alongside one another; their speed saves time; and special rigging, gear, and preparation is unnecessary. They are particularly recommended for transferring the sick and wounded. If the ship can provide a helicopter landing area, patients (including litter cases) may be placed aboard the helicopter and transported with a minimum of exposure. If a landing area is not available, patients must be picked up individually by seat, sling, or basket.

V. SUMMARY.

A. Explain the terms "delivery ship" and "receiving ship".

B. Describe the highline transfer gear.

C. Review flag hoist communication and signal procedures.

D. Discuss the approach, station keeping, and departure techniques.

1. Receiving ship makes the approach.

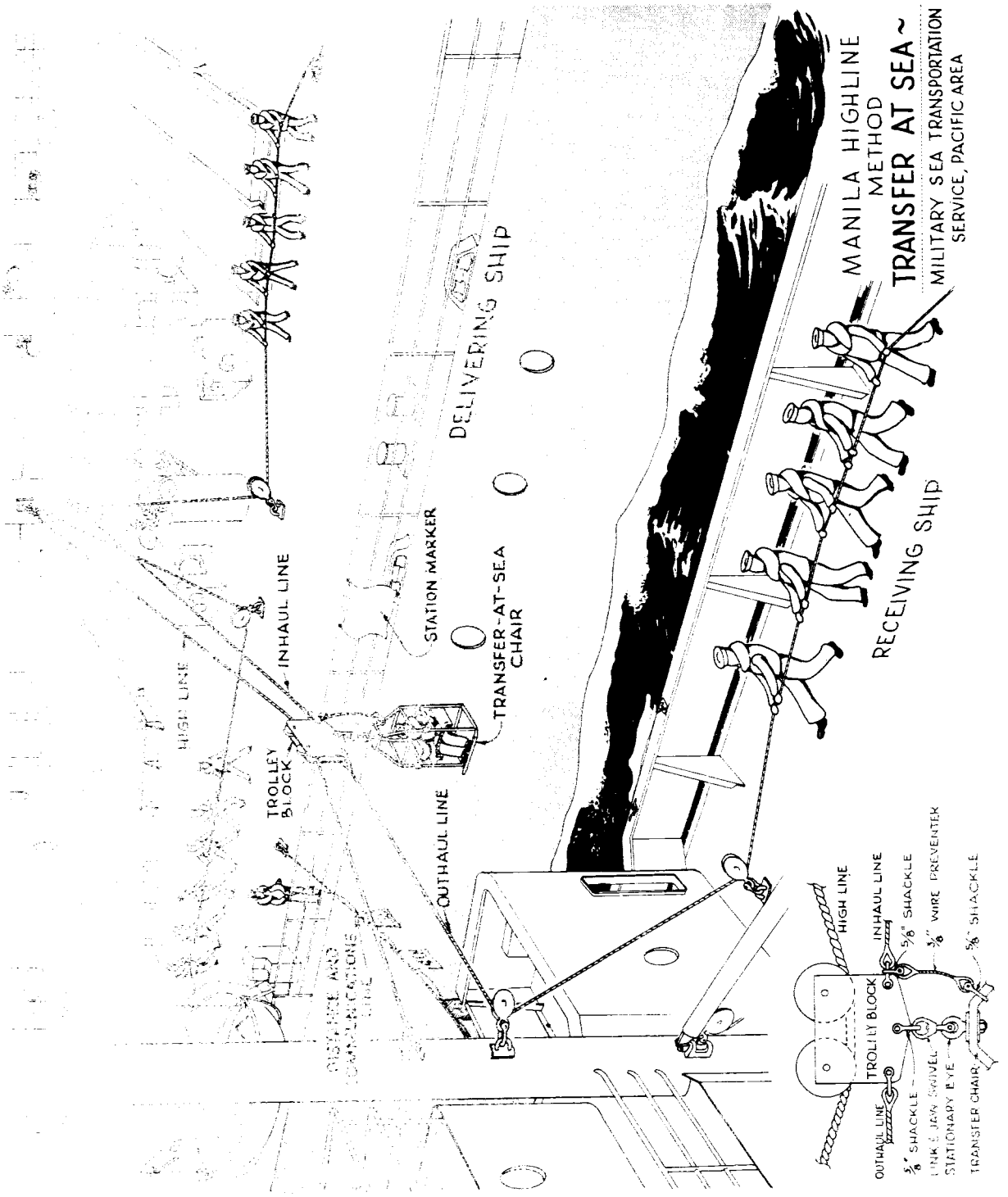
2. Distance between ships, generally from 60 to 120 feet with a maximum of 180 feet, depending upon weather conditions and sizes of ships involved.

3. With ships too close together, a certain amount of steering control is lost.

4. Because of the variations of flow around two ships underway, caution must be exercised in positioning ships.

5. It is the receiving ship's responsibility to take corrective action in maintaining station alongside the delivery ship.

6. The receiving ship is responsible for breaking away, although either ship may initiate an emergency breakaway.


MANILA HIGHLINE METHOD
TRANSFER AT SEA ~
MILITARY SEA TRANSPORTATION SERVICE, PACIFIC AREA
DELIVERING SHIP
RECEIVING SHIP
STATION MARKER
TRANSFER-AT-SEA CHAIR
INHAUL LINE
TROLLEY BLOCK
OUTHAUL LINE
HIGH LINE
INHAUL LINE
5/8" SHACKLE
3/8" WIRE PREVENTER
5/8" SHACKLE
TROLLEY BLOCK
OUTHAUL LINE
5/8" SHACKLE
LINK & JAW SWIVEL
STATIONARY EYE
TRANSFER CHAIR

4. Q. When is the electric portable megaphone to be used?

A. It may be used when alongside during the approach, before the sound-powered phones are hooked up. After the bridge-to-bridge phones are connected, the megaphone is to be used only as an emergency means of communication, such as in failure of the sound-powered phones.

5. Q. How is the highline gear aboard the receiving ship rigged?

A. The distance line is handtended and kept taut where it can be seen easily by the conning officer. The 5/8-inch (or up to 1-inch) shackle on the attachment end of the highline is secured to the upper padeye on the receiving ship. The outhaul line is rove through the snatch block on the lower padeye, and through fairleads as necessary. The outhaul line is led down the deck and handtended. It must not be led to a winch or capstan or made fast.

6. Q. On which side of the ship is the signal flag ROMEO displayed in highline transfer of personnel?

A. On the same side on which the transfer gear is rigged.

7. Q. How is the highline transfer station marked?

CH 2

A. By a three-foot square green bunting WITH WHITE LETTER P on the rail by day and by a red light station marker box by night.

8. Q. How would you rig the highline gear aboard the delivery ship?

A. Pass the highline through the trolley block and the upper snatch block, then through fairleads as necessary. Run it down the deck and man it with a minimum of 25 men. Pass the inhaul line through the lower snatch block and through fairleads as necessary. Run the inhaul line down the deck and man it. The other end is shackled to the trolley block. Send a shot line and messenger over to the receiving ship by bolo or line-throwing gun. Haul back the receiving ship's phone/distance line on the additional special messenger attached to the first messenger. Make the zero end of the distance line fast to the outer rail and man the sound-powered phone. When the attachment end of the highline is hauled over and secured on the receiving ship, haul it taut by manpower and signal to the receiving ship when ready for them to haul the load over on the outhaul line, meanwhile paying out on the inhaul line.

9. Q. What distinctive clothing does the man wear when firing the shot line?

A. A red safety helmet and red life jacket, jersey or vest.

10. Q. When the signal flag ROMEO is hoisted close-up aboard the receiving ship, what action is indicated?

A. She is commencing her approach for highline transfer of personnel.

11. Q. In an emergency breakaway, what is the most positive and quickest way of alerting the other ship?

A. Pass the word over the bridge-to-bridge sound-powered phone line, repeated by hand-signal. This is the primary means of communications for ordering emergency breakaway because of minimal noise.

12. Q. When the signal flag ROMEO is hoisted close-up aboard the delivery ship, what action is indicated?

A. She is in all respects ready to commence highline operations for transfer of personnel.

13. Q. What painting system is used to identify padeyes, links, blocks, and tools used with the highline gear and hauling lines?

A. They are painted with white enamel for ready identification and better visibility in night transfers.

14. Q. How is the distance line passed?

A. A special distance line messenger is sent over on the first messenger. The receiving ship unhooks this special distance line messenger, secures the zero end of the distance line to it, and signals the delivery ship to haul it across. The delivery ship secures the zero end to the outer rail and the receiving ship hauls it taut and hand-tends it.

15. Q. What signal flag is used to indicate the transfer of light freight instead of personnel?

A. YANKEE is used to indicate the transfer of light freight; ROMEO is used in personnel transfers.

16. Q. How is communication established between ships engaged in highline transfer operations?

A. Signal flags, radio-telephone and electric portable megaphones are used for communications before passing the bridge-to-bridge sound-powered phone/distance line. After the messenger line and phone/distance line is passed, signals between ships are given via sound-powered phones, paralleled by hand-flag or light signals.

17. Q. Why must the transfer litter be equipped with a protective frame and flotation gear?

A. To protect the patient from injury by the highline gear if it parts and to keep the litter floating upright and the patient's head out of the water.

18. Q. How is the highline gear retrieved after transfer is completed?

A. The delivery ship retrieves the trolley block and chair and slackens the highline. The receiving ship stops off the end of the outhaul line to the attachment end of the highline and then unshackles the highline. The delivery ship hauls in the highline by means of the outhaul line and then casts off the phone/distance line which is hauled back aboard the receiving ship.

19. Q. Which ship makes the approach, maintains station, and clears away from the other in highline transfers?

A. The receiving ship.

20. Q. In an emergency breakaway, which ship is responsible for clearing away from the other?

A. Both ships manuever clear as necessary.

B. Application. Use the next highline transfer drill as an opportunity to explain and demonstrate the use of the gear, rigging and transfer procedures, and safety precautions.

VII- Protection for Transfer Litter at Sea

A greatly improved protective frame and flotation gear for use in the transfer of litter patients at sea has been developed by the Bureau of Ships.

The purpose of the frame is to protect the patient from injury by the highline gear if it parts, and the flotation equipment keeps the litter floating upright and the patient's head out of water.

The development, which was cooperated in by the Norfolk Naval Shipyard, was based on the following design requirements:

- Maintain the patient at a level position while the litter is supported by highline.
- Support the patient in a safe position under static conditions in the water with sling and trolley devices attached and also under towing conditions, if practicable, such as would occur if the highline carried away.
- Protect the patient from being injured by the falling parts of the rigging in case of highline failure.
- Protect the patient from possible injury when the litter strikes the side of the ship or the trolley device strikes the patient while it is being retrieved under dynamic conditions underway.

The new litter meets these requirements and is considered a great improvement over previous types. The protective frame and the arrangement of the flotation gear on the litter were thoroughly evaluated, and the chances of a patient's being injured by a falling trolley or of a patient's turning face down in the water in case of highline parting have been eliminated.

For compactness and easier stowage the guard frame is collapsible and can be folded down upon the litter. Also, when not in use, the float bags should be stowed inside the litter.

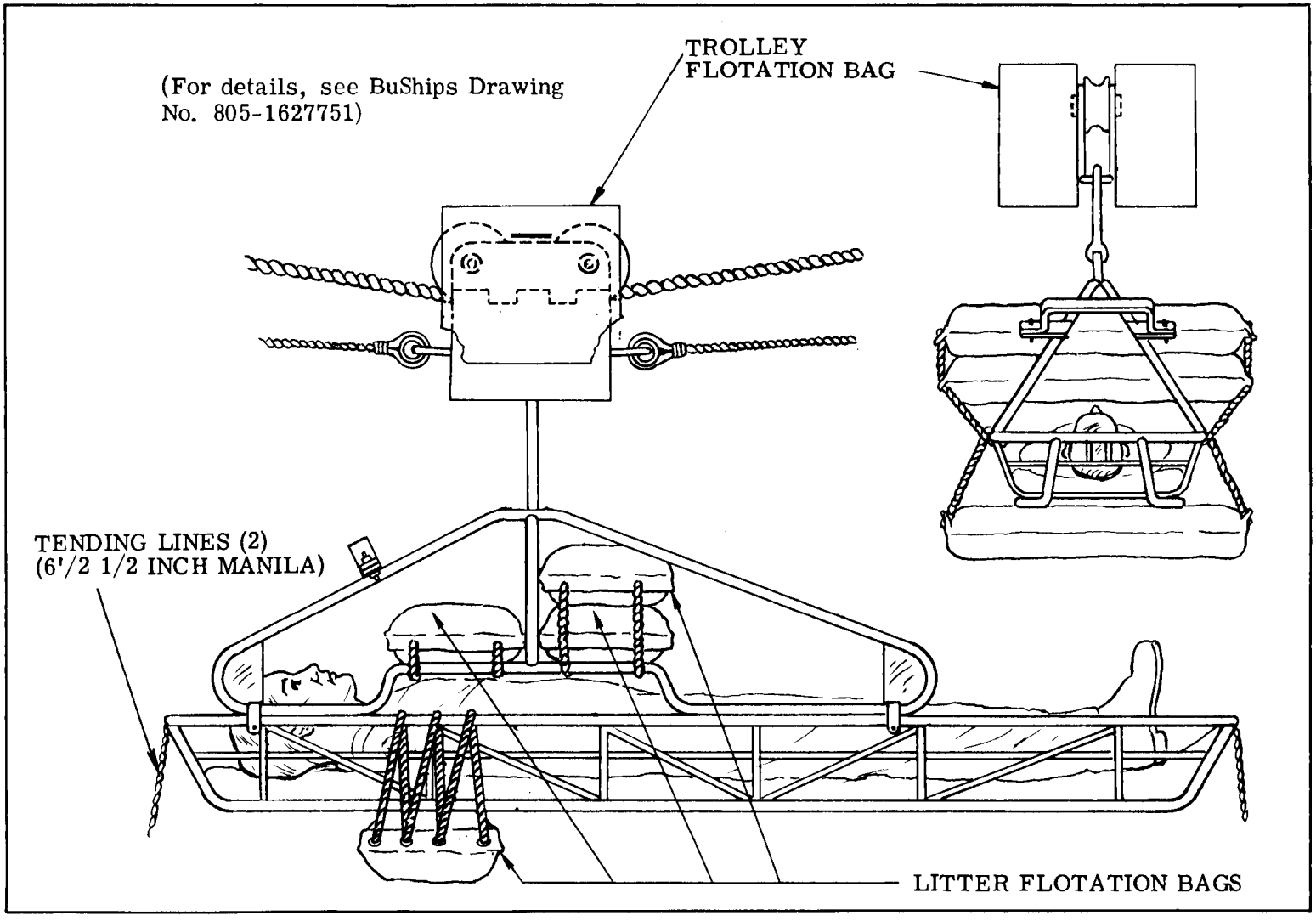
Each float [illegible] contains [illegible] or 8 pounds of [illegible], mat[illegible] tained from surplus life pre[illegible] international orange plastic [illegible] for painting the float bag ext[illegible].

Rigs used previously du[illegible] patients at sea [illegible] a highline parted during a tran[illegible] dropped into the water, the ge[illegible] the litter and it was possible [illegible] turned face down in the wate[illegible].

The weight [illegible] improper flotat[illegible]. If the litt[illegible] an upright posi[illegible] the troli[illegible] tainly smash [illegible] result in seriou[illegible] was also possi[illegible] the trolley block [illegible] ward the head [illegible] on either the [illegible] shackled to the [illegible].

An aluminum [illegible] face ships is b[illegible] ment of the Na[illegible] 670-0178.

Allowance [illegible] modified to [illegible] 670-0178, and [illegible] standard plan [illegible] (supersedes Bu[illegible] 1626565, and [illegible] Litter Transfer [illegible] list of material [illegible].



Stokes Litter Rigged for Underway Transfer

CHAPTER 5

EMERGENCY SEAMANSHIP - For Deck Personnel (Lesson Plans)

Section 5.2

TOWING

I. OBJECTIVES.

A. To familiarize personnel with emergency towing procedures.
B. To acquaint personnel with towing equipment aboard USNS ships.
C. To familiarize personnel with safety precautions necessary in towing.

II. MATERIAL.

A. References:

1. BUSHIPS Manual, Chapter 29.
2. NAVPERS 16118-B, Seamanship, Chapter 10.
3. International Code of Signals, H.O. 87, Volume I, Appendix D.
4. MSTS Towing and Salvage Bill (Section 1.9).
5. COMSTS INSTRUCTION 4740.1 (Subj: MSTS ocean tow procedure).
6. Marine Salvage Operations, by Brady, page 171.

III. INTRODUCTION.

A. Introduce self and subject (Towing).

B. Establish scope of session and state objectives.

C. Arouse interest by posing the following questions:

1. What equipment would we use and how would we rig our ship if we had to be towed? (Each ship or class of ship may be rigged somewhat differently.)

2. What equipment would we use and how would we rig our ship if we had to tow another ship?

3. What is a catenary? Why is it important to have a good catenary in the towline of ships without a towing engine?

IV. PRESENTATION.

A. Ship Towing. See Section 1.9, Towing and Salvage Bill, for procedures in approaching and taking a ship in tow, and for letting go. Generally this merely requires the exercise of good seamanship to determine the best side of approach under the wind and sea conditions. A heaving line or shot line is passed, the tow's messenger and towline are hauled aboard, and the towline is secured. Care must be exercised in getting underway to avoid strain and parting of the towline. Start ahead slowly on the same heading as the tow. The tow can help by veering the towline slowly as it takes the strain. In letting go, the towing ship's stern is maneuvered as close to the tow's bow as possible and the towing ship's pelican hook is tripped to cast off the towline with its messenger

attached. These are hauled back aboard by the tow.

1. Generally, all seagoing tows are taken astern.

a. Astern towing avoids possible damage to the ships from heavy seas or swells; it also leaves each vessel free to ride the sea and swell at will.

b. The great difficulty in towing a large vessel on the high seas lies in the alternate straining and slackening of the towing hawser, caused by pitching of both ships and the tendency of the tow to sheer off, range up on, or fall behind the towing vessel.

c. Ships designed for towing have a towing engine (on the stern of the towing ship or on the bow of the tow) which maintains a constant tension on the towline. Other ships can tow or be towed only by the fixed towline method.

2. Scope of hawser.

a. In the fixed towline method, it is important to try to keep the ships "in step"; that is, to adjust the scope of the towline, if possible, so that the ships meet and ride over seas at the same time.

b. Generally speaking, the longer and heavier the towline used, the easier the towing will be. A decided dip or catenary acts as a spring, preventing variations in the tension from being thrown upon the towline in sudden jerks. The sag of the bight (catenary) depends not only on its length but also upon its weight.

c. If the length of hawser is such that one vessel is in the trough while the other is on a crest, the towline will first slacken and then come taut with a sudden jerk, which produces a much heavier than normal stress.

d. When a large vessel is being towed in deep water, 200 fathoms is about the minimum for a good shock-absorbing catenary.

e. If circumstances make it impossible to provide a sufficiently long scope, speed must be reduced.

f. There should never be enough stress on the towline to hoist its entire length out of the water.

3. Speeds in towing.

a. The speed at which a vessel can be towed depends upon her size and type, and upon whether or not she can provide any assistance with her own screws.

b. Sea and weather conditions also have an effect upon towing speeds.

c. Under normal conditions, a large non-self-propelled vessel may be towed by the fixed towline method at speeds of from 5 to 9½ knots. Better speeds are possible in ships equipped with a constant tension towing engine. Liberties, C-2s, and Victory ships make excellent towing ships when their revolutions are kept down to reduce cavitation and surging and to provide a steady thrust. Reference (5) recommends about 5 RPMs for each knot of speed.

d. In towing a non-self-propelled vessel, an increase in speed may be obtained if her screws are allowed to turn over freely--to idle. Caution: In a vessel with an unlocked screw being towed, the main engine lubricating system must be in operation or bearing failures may occur when her screw starts to turn from the pressure of the water.

e. A towing watch is set on the fantail of the towing ship and proper towing lights are displayed at night.

4. MSTS ocean tow procedures for normal towing operations are contained in reference (5). This includes information which will also be useful in emergency towing operations--towline pull for type of hull, towline pull at various speeds, a check list for MSTS ocean tows, and valuable information on towing gear, towing speeds, and towing procedures.

B. Ship Being Towed. Preparations to be towed by the fixed towline method, using the anchor chain and anchor windlass, are as follows:

1. Hang off one of the anchors of the ship to be towed and break open the anchor chain in preparation for rigging the towline.

2. Break out the towing (insurance) wire. Lead the bitter end forward along the side on which the towing ship will approach, in through the bow chock, and shackle it onto the anchor chain. Attach a manila messenger to the other end and lead it aft.

3. Receive the towing ship's heaving line and bend it on to the messenger. Pass the messenger out to the towing ship and then pass the towline.

4. The tow veers its anchor chain to the desired length and is towed by the chain on the anchor windlass wildcat. The windlass is engaged in gear, with the brake set up and stoppers or preventors secured to bitts.

5. In exceptional cases, the towing ship may pass her towing wire to the tow or both ships' towing wires may be shackled together where an exceptionally long towline is required.

6. A towline watch is set at the towing station on the bow and proper lights are displayed at night (sidelights and stern light).

C. Communication and Signals.

1. Radio-telephone and/or radio communication between the towing ship and the tow is essential. Under favorable conditions, power-megaphones can be used.

a. Towing signals as listed in International Code of Signals, H.O. 87, Volume I, Appendix D, and the MSTS Towing and Salvage Bill, Section 1.9, are used.

b. Towing signals are made by single international code flag by day, exhibited by hand or by hoisting. By night, flashing light towing signals are used; whistle signals may also be used. With other ships in the vicinity, care must be exercised to avoid confusion with blinker or whistle signals.

c. Establish communication between the towing station forward and the bridge of the tow and between the bridge and the fantail of the towing ship.

D. Precautions.

1. If the propeller shafts on the tow are not locked, the main engine lubricating system must be operating in order to prevent bearing failures when propellers are turned by the water pressure.

2. Never rig a tow that cannot be released immediately. An emergency may arise which may require casting off the towline immediately. Such tools as sledge hammer, axes, and knives should always be on hand for emergency use. In a towing ship equipped with a towing pad and pelican hook, the hook is tripped to let go quickly. Wire preventors are cast off first. The tow's messenger is attached to the towline and is let go and hauled in at the same time as the towline.

3. When towing in freezing temperatures, with ice on deck remove the ice if possible and have sand available.

4. Use the .45 caliber shoulder line-throwing gun with buoyant, illuminated projectile where heaving lines cannot be used. The Kilgore rocket line-throwing gun has greater range but is not as accurate as the shoulder gun and will therefore only be used in exceptional cases. On order of the first officer, all hands will take cover when the line-throwing gun is fired.

5. During towing, if the towline comes clear of the water, it will have an excessive strain on it and may part. All hands at towing stations should then take cover.

6. Stop the propellers immediately in the event that the towline parts.

E. Ship's Towing Gear.

1. A ship not specially designed for towing, one without a towing engine, can tow another only by the fixed towline method.

a. In this method, the only means of cushioning stresses on the towing hawser is by veering the cable and chain to a cope of hawser long enough to provide a good catenary (downward dip) in the line.

b. Past practice for towing was to use a towing bridle, bent in a bight around a deck house or hatch coaming and then connected to the towing hawser.

c. Many ships are now equipped with a towing pad and pelican hook, conveniently located aft on the ship's centerline. The towline can be secured to this towing pad. It should also be reinforced by wire preventors to the stern bitts. Chaffing gear should be used wherever rubbing may occur.

2. All ships have "insurance wires" for towing. Anchor chain, paid out from the towed ship, should also be used to provide a good catenary. The two ships' insurance wires can be shackled together if necessary and, with anchor chain, provide an effective towline, even for large ships.

3. Manila or nylon towlines have greater stretch than steel wire rope, and can therefore be shorter, but have less ultimate strength than wire rope for the same tow.

V. SUMMARY. Review the key items.

A. The Towing Ship.

1. Towing astern is generally used in deepsea tows. Explain why.

2. Scope of towing line--over 200 fathoms. Longer towline and heavier gear make for easier towing. Stress importance of good catenary.

3. Speeds in towing astern--5 to 9½ knots.

4. Ship's towing gear. Point out that each ship and/or class of ship may be rigged differently. Review towing engines, fixed towline method, insurance wire, anchor chain, towing pad and pelican hook, wire preventors and chaffing gear.

5. Towline watch,communications and lights.

6. Precautions to be observed--Be ready to let go immediately if necessary, take cover if towline comes clear of the water, stop engines if towline parts.

B. The Tow.

1. Use and preparation of anchor chain.

2. Rigging to pass the messenger line and towing wire.

3. Veering anchor chain to proper length and securing it on windlass.

4. Towline watch, communications and lights.

5. Precautions to be observed--operate main engine lubricating system when propellers are turning, check anchor windlass, take cover if possibility of towline parting.

C. Communications. Stress importance of good communications by radio-telephone and towing signals in H.O. 87.

VI. TEST AND APPLICATION.

A. Test. Use these and additional questions as an oral quiz:

1. Q. Are seagoing tows taken astern or alongside?
A. Astern, to avoid damage from seas or swells.

2. Q. What is meant by keeping ships "in step"? Why is this done in towing?
A. "In step" means to adjust the scope of the towline between ships so that both ships meet and ride over the seas at the same time. The ships will ride easier, will make better speed, and there will be less strain on the towline.

3. Q. Why is it important to provide a good catenary (downward dip) in the towline? How is this done?
A. A good catenary cushions stress on the towing hawser and will avoid parting it. Length and weight provide a good catenary. Use a long towline, with sufficient anchor chain to provide the necessary weight.

4. Q. What is the minimum length of towline to provide a good shock absorbing catenary?
A. About 200 fathoms for a large tow.

5. Q. Why should you take cover when the towline pulls clear of the water?
A. When the towline pulls clear of the water, it has an excessive strain on it and may part, whipping back onto the ship with great force.

6. Q. What is the top speed for a tow by the fixed towline method?
A. $9\frac{1}{2}$ knots.

7. Q. What is the advantage of allowing a non-self-propelled tow's screws to turn over?
A. An increase in speed may be obtained.

8. Q. What precaution must be taken in a ship being towed with her screws unlocked? Why?
A. The main engine lubricating system must be in operation to prevent bearing failures when her screws start to turn from the pressure of the water.

9. Q. How are communications maintained between towing and towed ships?
A. By radio-telephone and/or radio, power-megaphones under favorable conditions, and by means of towing signals specified in H.O. 87.

10. Q. How are towing signals made by day and by night?
A. Towing signals and their meanings are listed in H.O. 87. By day, signals are made by a single international code flag, exhibited by hand or by hoisting. By night, signals are made by flashing light; whistle signals can also be used.

11. Q. How would you get a line across to the tow in order to haul in her messenger and towline?

A. By heaving line if close enough, otherwise by shoulder line-throwing gun.

12. Q. What gear does your ship have which would be used in towing or being towed?

A. Few ships have towing engines, but all have insurance wires; anchor chain and windlass; gear for use as towing bridles; wire preventors and chaffing gear; means for communications; and most ships are equipped with towing pads and pelican hooks.

13. Q. What are the advantages and disadvantages of manila or nylon towlines?

A. They have greater stretch than wire rope and therefore can be shorter. However, they are not as strong as wire rope.

B. Application.

1. Case studies. Review appropriate lessons from casualties and casualty reviews in Chapters 7 and 8 or from the group's experience.

2. Ship's gear. Check the ship's towing gear and discuss how it would be rigged, and procedures for both towing and being towed.

CHAPTER 5

EMERGENCY SEAMANSHIP - For Deck Personnel (Lesson Plan)

Section 5.3

MANEUVERING

I. Objectives	IV. Presentation
II. Material	V. Summary
III. Introduction	VI. Test and Application

I. OBJECTIVES.

A. To familiarize personnel with the natural, mechanical and maneuvering facets of shiphandling.

B. To develop an understanding of the importance of pre-planning in ship handling.

II. MATERIAL.

A. Training aids. Charts locally drawn as required.

B. References.

1. Ship Handling, King & Noel.
2. Knight's Modern Seamanship.
3. NAVPERS 16118-B, Seamanship, Chapter 8.
4. COMSTSINST P3120.2, Article 2-7-6 b., Williamson Turn.

III. INTRODUCTION.

A. Introduce self and subject (Maneuvering).

B. State objectives of lesson.

C. Outline scope of lesson.

1. Natural Aspects.
   a. The weight of the ship (displacement).
   b. Wind effect.
   c. Current effect.
   d. Shallow water effect.
   e. Bank cushion and suction.
2. Mechanical Aspects.
   a. Power available.
   b. Propeller effect.

c. Single or twin screws and direction of rotation.

d. Rudder effect.

3. Maneuvering Aspects.

a. Use of the anchor in maneuvering.

b. Heaving to.

c. Williamson Turn.

d. General aspects.

D. Arouse General Interest. Ship handling is a combination of technical knowledge and practical experience. Both are essential. While we "learn by doing," we've got to know what we are doing. Therefore, it is important to first learn ship handling characteristics before attempting to apply them in practice. As we gain more practice through experience, our judgment and skill in ship handling will improve.

E. Develop Personal Interest. Most deck officers have a full appreciation of what has been created in the building of a ship--a sense of something alive and responsive. This, along with good judgment, an eye for distance, and a calm personality will help you become a proficient ship handler. The basis for good ship handling is knowing the principles of ship handling and the characteristics of your ship so that you can determine in advance how your ship will react under various conditions. Deck officers must not pass over the study of ship handling just because they may seldom get an opportunity to take the conn. Learning is an active process and ship handling can be learned by observing others and anticipating how you would manuever in the situation. You'll be better prepared when you do get the conn.

IV. PRESENTATION. There are many facets of ship handling, depending upon the conditions and the type of operation--whether anchoring or mooring, making a landing, leaving a pier or another ship, in restricted waters, at sea, emergency ship handling, in convoy, or in ice. Each requires detailed study and procedures. It is suggested that each be discussed in detail using the references as guides. Only general aspects will be covered here.

A. Natural Aspects.

1. Weight of Ship (displacement).

a. In general, the more power a ship has, the more readily she will respond to her engines. But it is obvious, for instance, that a motorcycle will accelerate faster than a truck. The same condition exists between the Queen Mary and a destroyer. Because of her great length, height and tonnage, the Queen Mary cannot be maneuvered as easily as the destroyer, even though her engines are more powerful.

b. The destroyer being lighter will pull ahead of the Queen Mary when both ships increase speed simultaneously. By the same token, when decelerating, the Queen Mary will carry her way longer than the destroyer. This is a very important point to bear in mind when approaching a pier or anchorage. Confidence in ship handling must be tempered with caution for this reason. It is generally easier to put way on than to take it off in close quarters.

2. Wind Effect.

a. A ship's area above the waterline is referred to as the sail area; the wind effect on a ship depends largely upon the sail area and the ship's draft. For example, a tanker down by the stern with the forward tanks empty and a high bow will have a large forward sail area and will not readily come up into the wind. On the other hand, a ship with a large deckhouse aft and down by the

head will turn rapidly into the wind. A P-2, because of her amidships deckhouse, has a relatively even distribution of sail area and will lie to with the wind nearly abeam. Actually, because of propeller drag, the P-2 will drift before the wind with the stern pointed into the wind a few degrees.

b. The direction of ripples on the water, flags and smoke can be used to determine the local wind variations. If these are not noted, the most careful plans for maneuvering can be upset.

c. Head winds can be used favorably in slowing down a low powered ship when making an approach to a landing, mooring, or anchorage. But avoid going downwind if the ship has limited backing power and a single screw. If it is necessary to go downwind, drop an anchor with only enough chain to give a short lead. This will keep the bow from blowing off the pier, will reduce drift or leeway, and will permit more propeller power to increase the rudder effect.

3. Current Effect.

a. If possible, the best time to maneuver is during slack water. However, this isn't always possible, so the conning officer will have to predict the current and cope with its effect on the ship. Ship maneuvering should be planned to take advantage of the current. If not possible, then maneuvering should be planned to allow for the effect of the current.

b. A current will turn a ship around until the greatest area of the vertical underwater hull is facing the current.

c. A ship lying dead in the water will be carried bodily downstream by the force of the current. This effect sometimes is not immediately noticeable, particularly if the ship is quite a distance offshore or in low visibility. Under such circumstances, an inexperienced ship handler may ignore or underestimate the current with embarrassing, if not serious, results.

d. Irregularities in the bottom and projections of land, piers, and breakwaters deflect currents, causing eddies. These eddies may be used to advantage in turning a ship around if a study of the chart is used to predict them. Currents are particularly tricky around solid pier ends when either the bow or stern overhangs the pier. The sweep of the current may force the stern to swing around if the bow is sheltered, or the reverse if the stern is sheltered.

4. Shallow Water Effect.

a. Shallow water reduces a ship's speed and interferes with rudder effect. This phenomenon is caused by bottom interference on normal currents and results in the need for more power to turn the ship. At the same time, the rudder effect is reduced by the resulting turbulence.

b. Interference of shallow water with normal propeller currents may be evidenced by a high stern wave generated by a ship steaming at moderate speed. This stern wave is a useful, visible sign for alerting the ship handler to shallow water.

c. A ship underway in a narrow and shallow channel may "squat," that is, draw more water than her maximum draft when stopped. In experiments and tests conducted in the David Taylor Model Basin and in New York Harbor and the Delaware River, it was found that this excess draft, or squat, could amount to $3\frac{1}{2}$ feet or more for a tanker drawing over 30 feet and proceeding at a speed of 13 knots. It was concluded that:

(1) Squat increases with an increase of speed.

(2) The closer the keel is to the bottom, the greater the squat.

d. Deck officers must bear in mind that when proceeding through restricted waters--where there is only three feet of water, or less, under the keel--speed should be reduced to the minimum required for good steerageway in order to minimize squat.

5. Bank Cushion and Bank Suction.

a. A ship approaching a should spot may take a sudden sheer to one side or another. This is caused by the depth of the water under the keel when it approaches zero. The reaction is similar to that of a ship approaching the bank of a canal or edge of a dredged channel. It is referred to as bank cushion and bank suction.

(1) Bank cushion is felt when the bow of the ship seems to be repelled from a bank or shoal spot.

(2) Bank suction is felt when tne stern of the ship seems to be attracted to a bank or shoal spot.

b. These effects can best be understood by visualizing the strong currents forward of the propeller being drawn into it and discharged aft. This action reduces the water pressure forward of the propeller and explains the following:

(1) When the stern of a ship is alongside a solid pier, it will tend to hold close to the pier when the engine is put ahead.

(2) When the bow of an overtaking ship underway is brought close to the overtaken ship's quarter, it will tend to be pulled into the ship's quarter.

(3) If the stern of a ship underway is brought too close to a bank or shoal spot, it will be drawn in toward the bank or shoal spot.

B. Mechanical Aspects.

1. Propeller Effect. Ships may have single, twin, or even triple or more screws. Because of engineering limitations, the single screw ship is the most prevalent, with twin screws the next type. Regardless of the number of screws, their individual effect will be similar in all cases and must be understood and utilized in manuevering.

a. Single screw. A single screw ship is less manueverable than a twin screw but can be handled in all situations if its propeller effect is used properly. With the engine going ahead in a single screw, right-hand propeller ship, the propeller blades turning clockwise will pull the stern to starboard and the bow will go off to port. Because of this, it is necessary to carry right rudder to steady the ship's head. With the engine going astern, the propeller turning counterclockwise will pull the stern to port and the bow will go off to starboard. With a left-hand propeller the effect will of course be just the reverse. This turning action is greatest when the ship is accelerating. It can be used to advantage in manuevering, especially to turn a ship in a restricted space by backing and going ahead, "backing and filling." It is also useful in making a landing on a pier or lock wall.

b. Twin screw. Twin screws provide greater flexibility in manuevering and greater turning effect since the propellers are set off the ship's centerline. In a twin screw ship the propellers turn in opposite directions. Generally the starboard screw turns clockwise and the port screw turns counterclockwise when going ahead. Going astern, they turn in the opposite directions-the starboard screw counterclockwise and the port screw clockwise. Operated individually, their effect is the same as a single screw but with greater turning action due to their position offset from the centerline. With both screws operating in the same direction (ahead or astern) and at the same speed, the twin screws cancel out each others' individual effect. Operated at different speeds or in different directions, their turning effect is increased.

(1) Either screw may be used ahead or astern at various speeds. A twin screw ship with its starboard propeller going ahead (clockwise) will drive the ship ahead and pull the stern to starboard. The port propeller, backing down at the same time (also turning clockwise) and at the same speed, will drive the ship astern and will also pull the stern to starboard. Because the two screws oppose each other, the ship will gain little or no headway or sternway and the bow will turn rapidly to port and the stern to starboard.

(2) The speed of the screws may be varied to increase or decrease the turning effect or the headway or sternway as desired.

(3) In event of rudder failure or loss, a twin screw ship can be steered by her propellers alone, varying speeds as necessary.

2. Rudder Effect. The rudder of a ship underway is affected by the force of water on it as it is turned off its neutral position on the centerline. The force of the water against the rudder's forward side forces the stern off in the opposite direction, swinging the ship in an area about its pivoting point, generally about one-third its length from the bow. It is important to note that the stern will move first, before the bow. Good helmsmen utilize this in steering by means of a range over the stern. Rudder action will cause a slight loss of speed and, at high speeds, may cause heeling. The rudder acts principally through the force of the water resulting from the ship's headway or sternway. With headway on, right rudder will force the stern to port and the ship's head to starboard. With sternway on, the stern will generally move in the direction the rudder is put over. Screw, wind and current effect may influence this, however. With sternway on and the rudder put hard right, the ship's stern should move to starboard. The greater the ship's headway or sternway, the less rudder necessary to turn the ship; the less the ship's way, the more the rudder required.

a. Turning circle. Each ship has its own particular turning circle - the path followed by its center of gravity in making a complete turn of over 360 degrees. Ship's officers should know their ship's turning circle and how to shorten its diameter, when a sharp turn is necessary, by increasing speed in a single screw ship or by varying speed or direction of screws in a twin screw ship.

(1) The speed at which a ship makes a turn has little effect on the diameter of its turning circle, although it does have a definite bearing on the time required to complete the circle.

(2) Turning circle tests indicate that, depending on the ship's speed, between two and three ship lengths are required to swing the stern clear of the original course line after putting the rudder hard over. This shows that in order to avoid a stationary object dead ahead, putting the rudder hard over would probably be ineffective unless the separating distance was more than three ship lengths.

(3) In the case of two similar ships approaching head-on, on reciprocal courses and at similar speeds, their helms would have to be put hard over in the same direction (both to port or both to starboard) at least six ship lengths apart in order to avoid colliding.

b. Single screw ship. In a single screw ship with a single rudder, the rudder is set on the centerline abaft of the propeller. The propeller action of a single screw ship tends to swing the stern to starboard when getting underway ahead, and to port when backing down. Since the rudder is set in the slipstream of the propeller, it can be used to increase or decrease this effect depending upon which way the rudder is put over and acted upon by the propeller wash. The more power used to start the ship going ahead, the greater the turning effect resulting from both the rudder and propeller action. To prevent the ship's head from swinging to port when accelerating ahead, in a single screw ship, put the rudder over to the right just before going ahead on the engine.

(1) To turn a single screw ship around in a limited space, put the rudder hard left and back down on slow astern. The stern will swing to port and the ship's head to starboard. When the swing is well started, stop the engine, put the rudder hard right, and go full ahead on the engine; the ship will turn to the right with surprising results. This cycle may be repeated (backing and filling) until the turn is completed. It is important to remember that the rudder will have no effect when backing down until sternway is on the ship, but it will have a tremendous effect if the rudder is shifted hard over before starting the engine.

(2) Under normal conditions with a single screw, single rudder ship, a port side landing is easier to make than a starboard landing. Approaching a pier port-side-to at an angle, back down on the engines and the propeller will walk the stern into position parallel to the pier. Depending upon the situation, the rudder may or may not be used. A starboard landing is more difficult because the stern will swing to port and away from the pier when backing down. To offset this, a slow approach made at a small angle to the pier is necessary. Backing down to check the ship's headway should be as light as possible. Also, depending upon the situation, left rudder may be used while moving ahead if tugs are not available. In such a case, the bow is started swinging to port as the ship approaches her starboard landing with some way on. At the right moment, the engine is reversed. The backing screw will stop the bow's swing to port, will pull the stern to port and the bow to starboard, taking the way off the ship and aligning it with the pier.

c. Twin screw ships. In twin screw ships with a small rudder, the rudder is normally clear of the propeller slipstream even with the rudder hard over. Because of this, rudder effect is not gained until the ship has gained steerageway. In twin screw ships with a large rudder, the rudder is affected by the propeller slipstream. Since the ship can turn readily under the influence of the rudder and both engines, it provides excellent maneuverability.

(1) Twin screw ships, in the event of rudder failure or loss of the rudder, can be steered by their screws alone by varying the speed of either screw.

(2) When making a landing, the rudder of a twin screw ship is normally not used as much as that of a single screw ship. The turning effect on the ship by backing down on one engine and going ahead on the other reduces this need.

C. Maneuvering Aspects.

1. Use of the Anchor in Maneuvering.

a. Regardless of whether a ship has twin screws or a single screw, the anchor is an important tool which often does the work of a tug. When dragging the anchor on a short lead, its resistance permits greater use of the engine(s) without increasing the way on the ship. The increased propeller wash results in quicker response to the rudder while, at the same time, the anchor keeps the bow from being affected by the wind.

b. Before using an anchor it is important to note the nature of the bottom and whether there are cables or any other obstructions in the area.

c. In addition to its primary use in anchoring, an anchor is used in many manuevering situations:

(1) When required to make a landing with a strong wind blowing on or off a pier and tugs are not available, the anchor will keep the bow from blowing off or onto the pier. On rare occasions, the anchor may be used in conjunction with the tug.

(2) If there is not enough sea room in which to turn with the aid of the propeller(s) and rudder alone, and if the wind and current are setting the ship down dangerously, dropping an anchor on a short lead is a quick solution to the problem. The ship will swing into the wind or current, the anchor is hove in, and the ship can proceed on her way.

(3) When approaching another ship in a narrow channel, there may be occasions where the ship will not answer her rudder or has taken a sheer due to bank cushion or suction. Again, by dropping an anchor at short stay, control of the ship is regained.

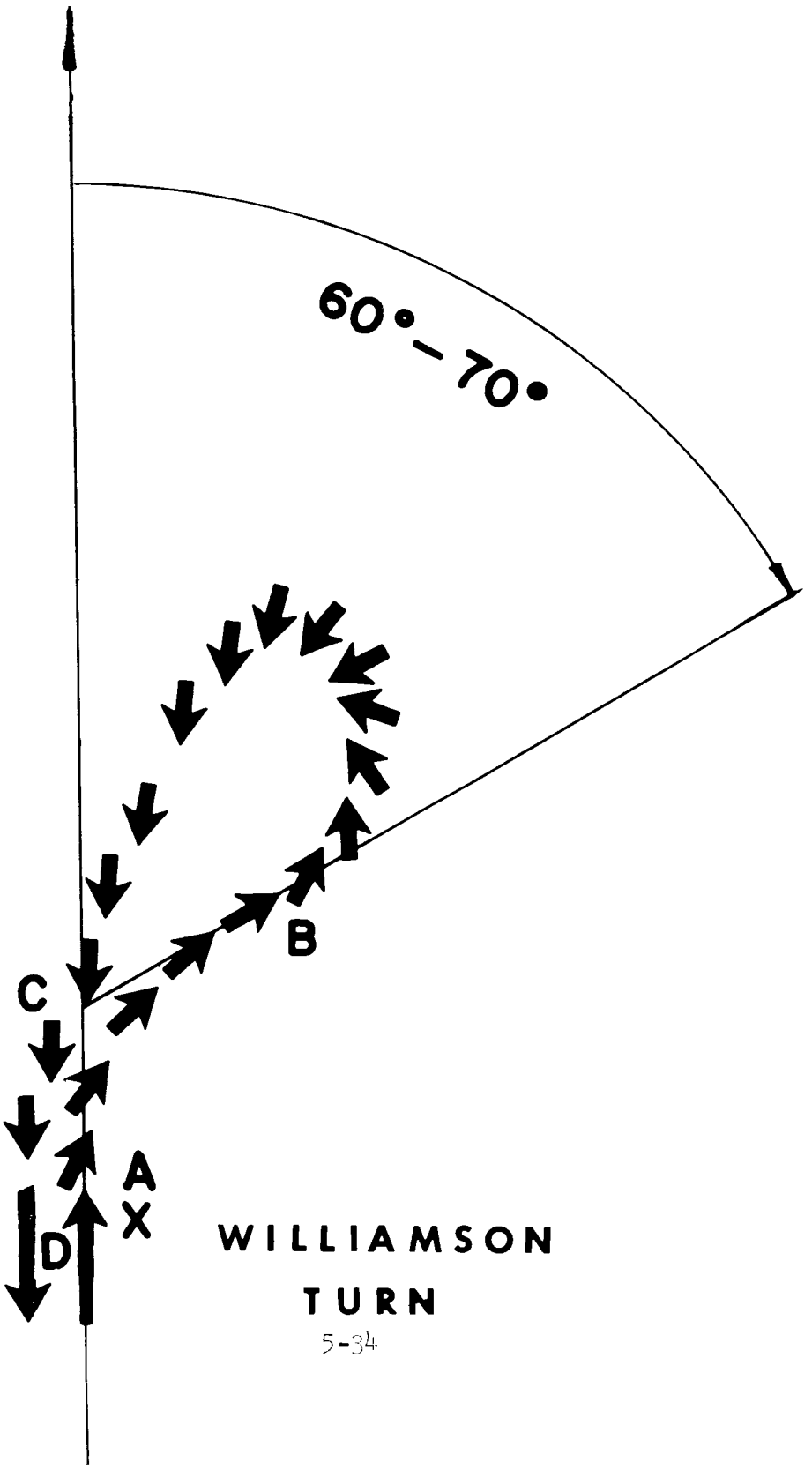
(4) If a single screw ship is required to stop suddenly in a crowded port or channel, use of the engine(s) in backing will throw the ship's bow to starboard, which may be dangerous. By dropping the anchor on a short lead, the bow will be kept under control. In extreme emergencies both anchors may be dropped and held.

(5) Shifting anchorages or moving into a more exact position in an assigned berth can be done easily with anchors hove at a short lead if the bottom is clear of all obstructions.

2. Heaving-to. Although weather forecasting and ship routings have simplified procedures, it often becomes necessary to heave-to in heavy weather. This is a maneuver that experienced deck officers will not hesitate to use. The destructive force of huge seas is tremendous. Proper ballasting and trim will of course help the ship ride easier. Slowing down in heavy seas will avoid or reduce damage, permit the ship to ride easier, and improve the riding comfort of passengers and ship's company. Many a ship has been "pushed" in heavy weather only to arrive in port with considerable damage, including strained and leaking plates and rivets. The result--far more time lost in the shipyard, and at considerable expense.

a. The method of heaving-to in heavy weather will depend upon the ship's location with respect to the storm center, and the ship's characteristics.

ORIGINAL COURSE



WILLIAMSON TURN

b. If making distance from the storm center is not a factor, the ship should heave-to heading into the seas with sufficient way on for good steering. In some cases it may be sufficient to merely check down to that speed at which the ship rides easily. It is amazing how a reduction in speed will result in an easy riding ship and will avoid pounding and straining.

c. The synchronization of the ship's rolling period with that of the wave period should be avoided by altering course and/or speed. Such synchronism will increase rolling and may even capsize the ship in extreme cases. Generally, seas on the quarter will cause the heaviest rolling and should be avoided if possible.

3. The Williamson Turn. The cry of "Man Overboard" will chill the heart of anyone hearing it. It is an alarm that sets off a series of events all aimed at one thing - the recovery of the man in the water. What are the first steps to be taken? It is a standard policy to immediately stop the engine(s) and swing the stern away from the side where the man fell over. While this procedure can do no harm, it is not likely to accomplish very much. Almost always, the man will have passed clear of the stern by the time the officer on watch has received word or is able to take action. The possibility of the propeller injuring the man is very slight if he is on the surface of the water. However, it may pull him under and toss him about in the wake. It is best to follow through by stopping the engine(s) and swinging the stern away; however, the importance of this precaution should not be overemphasized to the point where it interferes with the more important objectives of keeping the man in sight and picking him up.

a. The Williamson Turn is a maneuver used in man overboard to bring the ship back into its own wake and on the reverse of its original course. It consists of putting the rudder hard over toward the side from which the man fell overboard while, at the same time, maintaining the ship's normal cruising speed. As the ship's head nears 60 degrees from the original course (70 degrees in geared P-2's, 65 degrees in electric P-2's and C-4's) the rudder is reversed so that the ship does not swing past 60 degrees and the ship circles and steadies up on the reciprocal of the original course. The engines are then stopped and the ship will drift to the approximate position at which the man fell overboard. Ships using this maneuver at normal cruising speeds report that it is effective in various conditions of wind and sea although it requires about five minutes longer than backing down or circling.

b. The advantage of the Williamson Turn is that it will bring the ship back to the spot where the man fell overboard, even under adverse conditions such as poor visibility during darkness, fog, snow, and rain, or in heavy seas. Use the Williamson Turn under these conditions.

c. The disadvantages are that it is slow, and that it takes the ship a great distance from the man with the consequent danger of losing sight of him. Therefore, in calm seas and clear weather, it will be best to stop and back down or to come right around on hard-over rudder.

D. General.

1. Maneuvering requires application of all the above principles, tempered by experience and good judgment. A cardinal rule is that the conning officer must know his ship's handling characteristics. Safety should be the first consideration. A ship is a heavy mass and the damage it will sustain and/or inflict in collisions depends upon its speed. Therefore, it is wise to keep speed to a minimum when maneuvering in close waters or near a pier. The speed of the ship may be easily increased, but it is difficult to take the way off quickly.

2. There may be times when speed is essential in ship maneuvering as, for example, when entering a slip with strong cross winds or current.

3. The ship's backing capabilities and reversing procedures are important factors to learn and know. The ship's engineers should be called upon for information regarding these.

4. Evasive action to avoid collision requires keen judgment based on experience and an understanding of the ship's handling characteristics. Only through this experience and knowledge can a deck officer in a close collision situation determine whether to change course and/or speed, or to use the "crash stop".

5. Deck officers should know their ship's deceleration tables - its stopping distances at various speeds. MSTS deck officers have an opportunity to take the conn and are checked out in ship manuevering during damage control exercises.

6. A good ship handler will know his ship's handling characteristics, will study every detail before manuevering his ship, and then will select the appropriate plan, one which will utilize all favorable factors. He must also be alert to counter any unforeseeable effects. Safety will of course be his first consideration and confidence must be tempered with caution.

V. SUMMARY

A. Review the key points of the following:

1. Power versus displacement.

2. Wind and current effect.

3. Shallow water.

4. Bank cushion and suction.

5. Mechanical aspects of screws and rudder in manuevering:

a. Single screw.

b. Twin screw.

c. Rudder effect.

6. Use of anchors.

7. Heaving-to in heavy weather.

8. Williamson Turn.

9. Knowing and utilizing your ship's manuevering characteristics.

VI. TEST AND APPLICATION

A. Test.

1. Q. What ship manuevering aspect depends largely upon the sail area and draft of a ship?

A. The wind effect.

2. Q. Of what benefit to the ship handler is noting the direction of ripples on the water, flags and smoke?

A. It will determine the true direction of wind, a factor he must consider.

3. Q. What effect will current have on a ship lying dead in the water?

A. The ship will turn until the greatest area of its vertical underwater hull is broadside to the current and the ship will then be carried bodily down stream.

4. Q. What is meant by "bank cushion?"

A. The bow of the ship is repelled from a bank or shoal spot.

5. Q. What is meant by "bank suction?"

A. The stern of the ship is attracted to a bank or shoal spot.

6. Q. With the engine going ahead in a single screw, right-hand propeller ship, in what direction will the stern be pulled? What direction will the bow go?

A. The stern will be pulled to starboard. The bow will to to port. Right rudder counteracts this effect.

7. Q. In a twin screw ship with the rudder amidships and both engines going ahead at the same speed, in which direction will the bow swing?

A. The bow will not swing; the screws turning in opposite directions will cancel out each other's turning effect.

8. Q. What is "backing and filling" and how is it done?

A. Backing and filling is a manuever to turn a single screw ship around in a limited space. The rudder is put hard left and the engine backed slow astern. The stern will swing to port. When the swing is well started, put the rudder hard right and go full ahead. The ship will turn to the right. Repeat this backing and filling as necessary until turned.

9. Q. What is the advantage of the Williamson Turn?

A. It will bring the ship back to the spot where the man fell overboard under adverse conditions such as in poor visibility, during darkness, reduced visibility during fog, snow, and rain, or in heavy seas.

10. Q. What are the disadvantages of the Williamson Turn?

A. It is slower than coming right around or backing down and it takes the ship a great distance from the man with the consequent danger of losing sight of him.

11. Q. What is the danger of synchronization of the ship's rolling period with that of the wave period and how can it be avoided?

A. Synchronism will cause excessive rolling and possibly even capsizing. Synchronism can be avoided by altering course and/or speed.

12. Q. What does a high stern wave indicate?

A. Shallow water.

13. Q. How is an anchor used in manuevering?

A. An anchor serves to take the way off the ship in close waters, to hold the bow in position against wind and current, and in turning in restricted waters.

14. Q. What would you do when the ship begins to pound in heavy weather?

A. Notify the master, check ballast and trim, consider course and speed in relation to wind and sea and advise the master, who will take necessary action to ballast, check down, change course, or heave-to.

15. Q. Name some of the factors you would consider in manuevering your ship.

A. Consider the ship's characteristics, wind and current, depth, location, type of manuever or docking, character of bottom in connection with use of anchor, availability of tugs, traffic, etc.

B. Application. Deck officers' knowledge of their ship's manuevering characteristics and their ability to apply them will be checked during required damage control drills involving man overboard and the Williamson Turn, and ship manuevering under Rules of the Road situations, mine or torpedo evasion and docking exercises. In addition, actual heavy weather and manuevering situations should be used to instruct deck officers in ship manuevering aspects.