

PROCEEDINGS

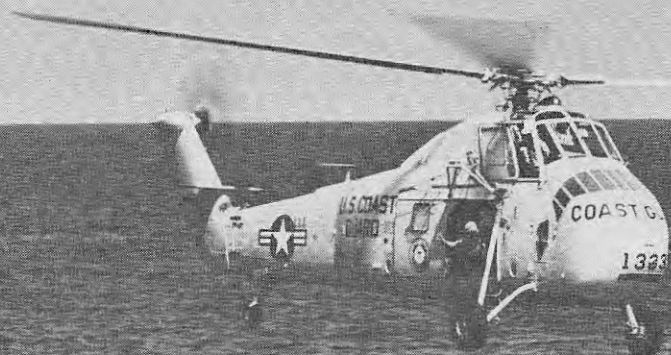
OF THE MERCHANT MARINE COUNCIL



UNITED STATES COAST GUARD

Vol. 18, No. 2 • February 1961

CG-129



Features

THE HELICOPTER IN RESCUE

LEGAL CONSEQUENCES OF THE RULES OF THE ROAD

PROCEEDINGS

OF THE

MERCHANT MARINE COUNCIL

Published monthly at Coast Guard Headquarters, Washington 25, D.C., under the auspices of the Merchant Marine Council, in the interest of safety at sea. Special permission for republication, either in whole or in part, with the exception of copyrighted articles or pictures, is not required provided credit is given to the Proceedings of the Merchant Marine Council. Use of funds for printing this publication has been approved by the Bureau of the Budget October 3, 1957.

The Merchant Marine Council of
The United States Coast Guard

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FRONT COVER

A Coast Guard HUS-1G simulates a hoist-basket pickup of a downed flyer from the sea during search and rescue exercises held off Miami, Fla.

CENTER FOLD

Oil Pollution Poster to be detached for use on Ships' bulletin boards. By A. E. Merrikin, Radio Officer of the SS *Texaco Wisconsin*.

BACK COVER

Four safety cartoons by Grandon Seal of the *Pacific Maritime Association*.

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NEW TYPE TOWBOAT AND BARGE



THE MARINE DEPARTMENT of Esso Standard, Division of Humble Oil & Refining Co., recently began using a new type of towboat and barge for delivering petroleum products in the restricted tidal waters of greater New York Harbor. The MV *Esso Pelham* resembles Mississippi River push-type towboats but permits towing the barge on a hawser when conditions preclude pushing. The barge, *Esso Tow No. 1*, has a spoon-shaped bow which minimizes water resistance. The stern is notched to accommodate the bow of the towboat when pushing. Modern four-stage deep-well pumps discharge a full cargo of about 15,000 barrels in approximately 3 hours.

COMMENDATION



MR. GEORGE W. DAVIS receives his letter of commendation from Captain Robert Flockhart, USCG, Officer in Charge, Marine Inspection, Houston, Texas, in the above picture.

From left to right are: Captain C. D. Phillips, Port Captain, American Oil Co.; Mr. Davis; Captain Flockhart; Commander Allan V. Falkenberg, USCG, Senior Inspector Materiel, Houston, Texas; and Captain R. N. Polumbo, Port Agent, Masters, Mates, and Pilots, Houston, Texas.

CHIEF OFFICER George W. Davis, of the *SS Amoco Virginia*, recently received a letter of commendation for his exemplary conduct in assisting another crewmember to safety during the fire which raged following a series of explosions aboard the vessel in November 1959.

The report of the Marine Board of Investigation which inquired into the circumstances disclosed that after others had abandoned the vessel Mr. Davis went to the assistance of a galleyman who had been rendered helpless by shock and refused to leave

the mess compartment. Despite dense smoke the Mate succeeded in coaxing the man out and over the side into the water. When Mr. Davis learned that the galleyman could not swim, he held his head above the water until additional assistance was received from shore.

Were it not for the Mate's determined and unselfish efforts the life of the galleyman may well have been lost. The high regard for the welfare and safety of a shipmate demonstrated by his action is in keeping with the highest traditions of the U.S. Merchant Marine.

AMVER

The Atlantic Merchant Vessel Report (AMVER) System, a relatively new aid to Search and Rescue in the Atlantic, makes use of voluntary reports from merchant vessels of any nation. A center in New York receives position and movement information channeled from 17 widely located radio stations. There, an electronic computer is used to enable rapid listing of vessels in the proximity of an emergency as soon as one is reported. Merchant vessels already underway near a distress scene have long and repeatedly proved extremely valuable. The AMVER system makes better and faster coordination possible, and has often saved valuable time for unneeded vessels following a dis-

tress call. It can be seen that the greater number of ships participating in the system, the more effective it becomes.

At the present time instructions for participating in the AMVER system are available from the Coast Guard only in the English language. We note with much interest, however, that versions in other languages have appeared in maritime publications of other nations. AMVER instructions in German now appear in that country's Hydrographic Office publication, *Nautischer Funkdienst, Band 1* (Nautical Radio Service, Volume 1). The address of this office was given as follows:

German Hydrographic Office
Nautischer Funkdienst
Hamburg, Germany
Bernhardnocht Str

There was a Swedish summary of AMVER instructions in the *Swedish Shipping Gazette* No. 31, of August 4, 1960, Page 1512.

In Great Britain, the AMVER instructions are included in the *Admiralty List of Radio Signals* issued by the British Hydrographic Office.

It may be that additional printings of AMVER instructions in other countries have been made. Commander Eastern Area, U.S. Coast Guard, Custom House, New York, N.Y. would very much appreciate information on the availability of other language versions of AMVER instructions.

THE HELICOPTER IN RESCUE

By Captain Woodrow W. Vennel, USCG



A U.S. COAST GUARD HO45 helicopter on a mercy mission hovers over the stern of a 551-foot tanker to airlift an ailing seaman.

THE VERSATILE HELICOPTER

THE EVER SO VERSATILE HELICOPTER is one of the more modern equipments maintained by the Coast Guard for operation as a rescue facility. Most of the Coast Guard helicopters are strategically located contiguous to the well-traveled searoutes in general use by seafaring personnel, and to the areas of concentrated small boating activity.

THE HELICOPTER

The word "Helicopter," according to Webster's New International Dictionary, stems from the Greek *HELIX*, -IKOS, meaning spiral, plus *PTERON* or wing; and is defined as "a form of aircraft whose support in the air is derived from the reaction of a stream of air driven downward by propellers

revolving around a vertical axis."

The helicopter depends upon its rotating wings and the airflow over them for its support. Any change in the airflow, either from a rotational speed difference or a wind change, upsets the fine balance of flight—especially noticeable in hovering. To keep the helicopter suspended over a spot, whether it be a moving ship's deck, or a fixed point, the pilot has many things to do, all correlated together. The left hand controls the height of the helicopter by a change in the pitch of the blades and the speed of their rotation. A change in one requires corresponding change in the other. The right hand controls the direction of movement of the helicopter, backward, forward or sideways. Any movement here affects the lift balance

of the helicopter—both hands must act in coordinated relation. Changes made by either or both hands affects the torque input into the rotor. To prevent the helicopter from changing heading—rotating about its center—both feet of the pilot are employed constantly. Any foot movement requires movement of both hands to correct for changed torque. If the hovering maneuver is being performed for a hoist pickup, the pilot must constantly talk on the interphone and radio, to receive or transmit guidance instructions. During the entire operation, his eyes are required inside to monitor the status of flight—but they are also required to observe outside to hold his relative position—he practically maintains a "split watch" with his eyes.

It would be difficult to give a word picture of all the problems associated with the use of helicopters in a search and rescue operation, but some idea of the situation can be seen in the following example.

A TYPICAL STORY

The typical quiet in the Operations Office of one of our Coastal Air Stations in the late afternoon one George Washington's Birthday, was broken by the clanging bell of the "hot line" from the District Rescue Coordination Center. A radar picket ship on station 200 miles southeast of the nearest point of land had run afoul of extremely rough weather, and now had two seriously injured petty officers aboard who required earliest medical attention. Their evacuation appeared necessary if they were to survive, particularly in view of the rough conditions still to be encountered and the lack of proper facilities on board. The vessel requested their removal at 0600 the following morning, at sea, at rendezvous point to be determined according to sea conditions en route. Weather for the entire area of operations at this time was snow showers, 20- to 35-knot winds, 8- to 10-foot seas, with a forecast for little change. A helicopter removal of these injured persons was practically dictated by the existing weather. The nearest point of land which was served by an

airport or other facility from which refueling could be accomplished was 100 miles from the base of the helicopter. A need for a hospital corpsman in the helicopter was dictated by the condition of the evacuees, one of whom suffered a broken back while the other sustained a severe head injury as well as a fractured arm. Forecast weather conditions suggested the need for an additional crewman to assist in the cabin during the contemplated rough weather hoist. The resulting decision proved extremely sound, but now there would be four crewmen in the helicopter—pilot, copilot, hoistman, and corpsman.

SIX MEN ABOARD

At completion of the hoisting operations, six men would be aboard the helicopter. This determined its operating weight for return to a refueling area. As the rendezvous point was unknown at the planning stage, maximum distances for flight had to be considered. The fuel to go that distance, hover sufficient period of time to hoist two persons, and return to a refueling area, set the departure fuel load. With four persons aboard en route to the scene, and six returning, the helicopter would gross out at a heavy operating weight. If a search should be necessary to locate the vessel, then additional fuel would be needed. This would bring the heli-

copter to maximum operating weight—always frowned upon by experienced pilots, but frequently necessary if the mission is to be accomplished.

THE QUESTION OF DEPARTURE TIME

The question of departure time so that rendezvous would be effected at about 0600 the next morning had to be resolved. Should departure that evening or the next morning be attempted? What weather would be encountered en route to the refueling stop? Would it be better in the morning or worse? Would conditions encountered later cause failure of the mission? Conditions at the moment were such that the mission could proceed to the fueling point; but were adequate rest accommodations available thereat? Could the helicopter be started in the morning if it remained exposed all night in freezing, snowy weather? These and many other questions had to be resolved before the mission could move; not the least of which was what equipment would be used to effectuate the hoist, considering the condition of the two evacuees? In any event, the flight must be made at night in semi-instrument conditions, if rendezvous was to take place at 0600 the following day.

Arrangements were made to depart at about 0330 in the morning—after 5 hours of little but fitful sleep, during which the planning was thoroughly reviewed. Actual departure was made at 0340, in light and intermittent snow showers, arriving at the refueling area one hour and twenty minutes later. To assure sufficient power available to start the helicopter engine, a portable generator was aboard which would be left at the refueling point when departure for rendezvous was made, approximately 1 hour and several cups of coffee later. Rendezvous was accomplished after 35 minutes of flight in company with a Coast Guard fixed wing aircraft which had been directed as escort throughout the overwater portion of the operations. Coast Guard helicopters are not equipped with emergency flotation gear and the use of a fixed wing aircraft for escort is considered desirable to prevent loss of personnel in the event of further emergency.

EN ROUTE TO RENDEZVOUS

En route to the rendezvous, explicit voice radio instructions were issued to the vessel setting forth the need to set, and remain, on the same voice radio frequency, the need for keeping the way of the vessel at minimum for steerage, with the wind on the port bow for ease in holding position for pickup. Additional instructions were

ABOUT THE AUTHOR

A 1935 GRADUATE of the U.S. Coast Guard Academy, Captain Woodrow W. Vennel, USCG has been closely associated with all types of Coast Guard aircraft. He received his wings from the Naval Air Station, Pensacola, Fla., in 1940.

He commanded the Port Angeles Air Station from April to June 1945 after various flight duties during World War II. In June 1945 he piloted a PBM seaplane to a landing in the Pacific Ocean 500 miles west of Cape Flattery, Wash., to remove a sick sailor from a vessel.

After serving at the Coast Guard Air Station in Brooklyn from July 1945 to August 1946, Captain Vennel reported to Coast Guard Headquarters, Washington, D.C., to duty as Assistant Chief, Aeronautical Engineering Division. He was assigned the additional duty as Coast Guard—Treasury member of the Subcommittee for Divisional Standards Provisional International Civil Aviation Organization, predecessor of the ICAO.

From August 1951 to 1955, he commanded the Coast Guard Aircraft Repair and Supply Base at Elizabeth City, N.C., then commanded the Coast Guard Air Station at Salem, Mass.



While at the Salem Air Station Captain Vennel was awarded a Commandant's Citation for a hazardous helicopter pickup at sea. In July 1957, he became Chief, Aeronautical Engineering Division at Coast Guard Headquarters in Washington, D.C., the position he now holds.

Captain Vennel presented the many facets of the Coast Guard's use of the helicopter in a Panel Discussion of the Marine Section, National Safety Council, at their 1960 annual meeting.

passed describing the pickup methods, and insisting that persons on deck in the vicinity of the hoist operation be limited to those actually required for its performance.

As a matter always requiring attention, the vessel was advised to lower and secure, if possible, all afterstays, whip antennae, booms, lines, etc., that might be cause for entanglement of the hoist cable. She was requested to advise if there would be any rigging of any kind that could not be stowed or housed about the selected area, which could possibly foul the operation. If it was impossible to clear an area sufficient for effecting a hoist without interference, the vessel was requested to so advise. It would then be necessary to place the injured men in a small boat to be towed astern, thus providing the necessary security and safety required in the hoist procedure.

STOKES LITTER

It was directed that the hoists would be made from the afterdeck. The more seriously injured man would be hoisted first by means of the stokes litter. It was explained how the four bridle hooks attached to the lowered stokes litter were to be removed from the four corners. The seaman with the broken back was to be ready and strapped into a stokes litter furnished by the vessel. The hooks as removed from the lowered litter were to be attached to that provided by the ship,

corner for corner. When ready in all respects to have the litter hoisted, the deck crew was to signal the helicopter accordingly, and the hoist would be accomplished. No time was to be wasted. The rescue basket would be lowered immediately after completion of the stokes litter hoist and the vessel could proceed after it was clear of the ship's rigging. After lowering this device to the deck, it was to be unhooked. The patient was to be seated in the basket and instructed to hold on to its side rails. When everything was in readiness for pickup, the cable would again be lowered to within reach, and without further ado, was to be attached to the basket at its only attach point, whereupon it, and the patient, would be hoisted to the helicopter cabin.

CAUTION SHOULD BE EXERCISED

The general precautionary rule which must always be emphasized at each operation is that all caution should be exercised so that the deck crew will not attach the hoist cable to anything except that which is to be hoisted, never to the rail, a stay, or other part of the vessel. To have the hoist cable attached to the vessel in any manner may seriously jeopardize the success of the mission, for it will in all probability be necessary to cut the cable from the helicopter.

After delivery of all instructions, the vessel was requested to repeat the

details so that no misunderstanding would be evident. The 35-minute flight to rendezvous appeared to be very short with all of this activity taking place. The need for a search on the mission was obviated because of vectoring information furnished from the ship's radar. Radar contact was made and an identification turn directed, after which visual contact was made at 11 miles. Radar will not always be available. Such assistance, in fact, should not be considered in computing requirements. However, if your vessel is equipped with radar, vectors furnished can frequently save many valuable minutes of search time. An offer by you to the helicopter pilot is all that is needed.

CONTACT ESTABLISHED

Soon after visual contact was established, it was apparent that the vessel was proceeding at a comfortable hoisting speed of about 7 knots but with the wind on the starboard bow! And after acknowledgment of instructions, too! This discrepancy is easily explained, however. In fixed wing aircraft the pilot is always on the left side—in helicopters, the pilot is on the right. A general understanding of fixed wing aircraft discloses that if the pilot is seated on the left side, he could control the situation better with the wind on the starboard bow. The opposite, of course, is the case with helicopters. Adherence to stated instructions is absolutely necessary.

FIRST HOIST

As soon as this discrepancy was corrected, the helicopter proceeded to position itself for the first hoist. This is a teamwork operation with the pilot being assisted by the hoist operator who talks the pilot down into a good hoisting position. The decision to hoist the stokes litter first was based on the limited space available in the cabin and the need for all the maneuvering room possible therein. With three men already in the cabin, picking up a stokes litter and placing it securely in its tie-downs would be quite a feat—thus the decision to hoist the stokes litter first. Although the ship was rolling considerably, no difficulty was encountered with the hoist. The deck crew was alertness itself and demonstrated that the ship's organization was of the highest order. Upon assuming hoisting position, observation disclosed the patient on deck securely strapped in the ship's furnished litter, awaiting hoist. The bridle was quickly released, and reattached to the ship's litter—not more than 30 seconds was required. The entire hoist operation from lowering to securing the litter in the cabin was performed in about 2 minutes.



PUMPS AWAY—Coast Guard HUS-1G HELICOPTER drops a portable pump to a sinking fishing vessel. Five hours later the ship reached port under her own power.

PILOTS PROBLEMS

Only the pilot seemed to have problems. The wind was gusty, the ship rolling heavily—maintaining position was not easy. It was accomplished with some misgivings. Vertigo from watching the constantly heaving, rolling ship was fought off with difficulty. The pilot's sigh of relief was probably audible to those sturdy individuals 40 feet below on the bobbing deck, when the stretcher and its injured occupant were safely inside. To relieve the tension thus generated, the helicopter was flown in a rather large left-hand circle around the portside of the vessel to return and resume a position preparatory to the next hoist operation.

Having first performed a hoist with a rather unwieldy stokes litter on the hook, one would be inclined to conclude the next would be a matter of routine, especially when the ship's crew was performing with such complete reliability. Not so! Although the basket is ultimately more simple to handle, both in and out of the helicopter, the ship's motion was beginning to have its effect. It seemed the helicopter wouldn't stay suspended over that indefinable spot—the cable was being lowered with the basket swaying in a pendulous motion as it was blown in the breeze and acted upon by the increasingly difficult-to-control platform. It finally reached the deck. Again the vessel's crew demonstrated their complete capability for handling the problem—the hook was disconnected promptly then hoisted out of the way to assure that it wouldn't be fastened to some readily available stay or the handrail. The patient seated himself in the basket and with a look skyward awaited the hook which was lowered and promptly attached—but not too soon—for at that very moment, vertigo, the sensation that everything was moving in the wrong direction, took command of the pilot and there was little recourse but to apply a burst of power and climb rapidly, obtaining a new reference for visual control—the horizon. With the hoist operator adequately aware of the situation the cable was reeled in at high speed, to quickly bring the startled passenger into the comparative safety of the now cramped cabin. The hoists were complete, the first part of the mission had been accomplished. It remained now to deliver the patients to the awaiting ambulance on the Naval Hospital lawn. This could not be done however, until a fuel stop had been made; again, at the point of overwater departure.



Photo courtesy Traverse City Record Eagle

AN HO4S-3G HELICOPTER from U.S. Coast Guard Air Station in Traverse City, Mich., tows a trapped 42-foot fishing tug one-quarter mile through fields of thick pancake ice and brash and slush ice to safety of open water in the above picture. The metal hulled fishing tug with a white wheelhouse aft was disabled one-half mile off the beach 4 miles west of Seul Choix Point on Lake Michigan, about 10 miles from Manistique.

That insurance item, the auxiliary power unit, was again left behind, to be returned at later convenience.

WHY INSTRUCTIONS ARE DEMANDING

If I may digress for a moment to give you a short word picture of a helicopter pilot's actions while performing this essential operation of hovering, you will more readily understand why he will be demanding, even adamant, in his instructions to a vessel, before he effects a hoist pickup from a ship at sea, or even from a boat under oars or being towed astern. The pilot may make it look like a simple feat—this hovering over a vessel, but let me tell you, it has taken much training, and more practice. A good many gray hairs have been added, not only to his crop but also to those of his associates who have had to qualify him for this seemingly simple feat; including crew members who are performing so faithfully down in the cabin operating this "lifeline" through its hydraulic system, "conning" the pilot into the best hoisting position by means of the "intercom"; and unconsciously heeding the sensations of the hovering helicopter so that he may instantly recognize a pending emergency reaction by the pilot.

One can see that to perform this vital emergency mission the Coast Guard pilot in command of a helicopter will request that certain specific requirements be provided before he

will attempt to remove an injured person by hoist from a vessel at sea.

REMOVING AN AMBULATORY PERSON

We have discussed injured personnel removal, but sometimes it is necessary to remove a physically able, ambulatory person for one reason or the other. The actual hoisting operation in either case is similar in requirements. For this latter purpose the helicopter is again ideally suited, and such a pickup can be made by means of the rescue basket or by the rescue sling. The rescue sling is only a padded strap device that we like to call a "horse collar," which it resembles; however, it is placed under the arms, around the chest, and not around the neck! Usually the sling is reserved for use with personnel who are familiar with it, although placards give specific information to permit its use by the uninitiated. On deck, it is handled almost exactly like the basket, in that upon its delivery it is generally unhooked, attached to the wearer; and when ready for hoisting, reattached to the hook. When lowered to a person in the water, the sling remains attached to the hook at all times, so that it will not go adrift. The sling is as useful with a conscious man in the water as it is on deck.

In using the sling the occupant should not attempt to relieve his weight by holding to the hoist cable—

this will only make him less secure in the sling. Another caution that is applicable for all rescue devices used by the Coast Guard for helicopter pickup—never attempt to assist yourself into the helicopter cabin upon reaching the door—the hoist operator is fully competent, and your attempt at help may hinder rather than aid your access to safety. We, in this lifesaving business, are as anxious for your safety as you are. We have found that your safety is greater if you do not attempt to assist your way into the helicopter.

RESCUE SEAT

The Armed Services have recently developed a rescue seat which is basically a three-fluked anchor, so designed that a man in the water can sit on the flukes. It can be towed into position readily by the helicopter, for it offers little drag. Once seated, the person will assume a natural attitude on the flukes and wrap his arms around the stock. This device has been under an improvement program by the Coast Guard to provide more safety. It is now approved as a circular ring at the end of a stock similar to a mushroom anchor. You may find either device in use, depending on the Service providing the helicopter assistance. Either seat requires little or no instruction, as its use will be readily apparent from the obvious features.

NEED FOR IMPROVED COMMUNICATIONS

One of the greatest problems of working the helicopter in a hoist operation around vessels is the need for improved communications. If voice radio is available, it can be used—the difficulty here is the need for a relay, between the point of reception on the vessel, to the crew actually handling the operation. A good ship's organization will usually provide for this need; however, where voice radio is not available, a loud-hailer from the helicopter to the deck is required. The Coast Guard has under development such a device which at this time shows great promise of being able to be heard above the helicopter noise as well as the vessel's internal noise, both of which usually are at a high level. If this device is as effective as tests indicate, it will serve very effectively when working around vessels, small boats under oars, fishing vessels, etc., thus allowing positive and intelligible instructions to be issued to assure satisfactory coordination of the rescue effort.

"TUGBIRD" EQUIPMENT

A recent Coast Guard development presently in use by our operating units is what we call "Tugbird" equipment. Tugbird was conceived for the specific

purpose of providing for expeditious arrival of a unit at the scene of distress, for the purpose of relieving an immediately dangerous situation by giving the helicopter a towing capability in reaching the nearest safe anchorage or haven. Specifically, the purpose was stated as: "to develop equipments and operating techniques to successfully tow small boats with the * * * helicopter, in support of Coast Guard Search and Rescue Missions. * * *" The gear is designed to afford the helicopter with a capability of exerting a maximum towing force of 4,000 pounds—sufficient to handle safely a vessel of approximately 400 gross tons. The towing force exerted is always indicated to the pilot giving him necessary flexibility in the operation. The maximum duration of the tow varies, of course, upon the distance from the helicopter's base of operations, and is a function of fuel remaining. The Coast Guard has proof that the usefulness of the capability will be demonstrated best for the benefit of the "rapidly expanding small boating public."

This towing equipment is self-contained in the helicopter and provides about 300 feet of tow cable capable of exerting a force controllable by the pilot, in a sea state of 5, under the most unfavorable wind conditions. A normal release and an emergency release are provided so that the pilot can command the utmost in safety while performing a towing operation. A weak link is also provided to assure the cable breaking at a designated point, should a malfunction fail to indicate that the cable strength is being exceeded. The towing of vessels from 400 tons down to the minimum of a 16-foot outboard has been very successful. Smaller vessels than this cannot be towed with this equipment with any reliance due to the controllability of the helicopter and lack of sufficient drag. Towing speeds vary with the vessel size and tow direction, relative to the wind. A maximum speed of 6 knots has been obtained while towing a 378-ton vessel.

In this towing operation the helicopter will approach the vessel to lower the bitter end of the steel towline to the deck. This should be attached to a forward towing bit through a suitable chock. When securely attached, the helicopter will, on signal, move out sideways to observe the towline lay, and take up the slack until about in proper towing position, where the pilot will turn the helicopter and assume the tow. A precaution is necessary—have no one on deck who is not required. We designed the gear to prevent the towline from parting, but if it should,

at some point other than at the release or weak link, it could snap back and possibly create a dangerous situation for either the vessel or towing helicopter. If the pilot releases the tow while under tension, there is no danger; the line snaps back from the helicopter and flakes into the water ahead of the vessel. Do not be alarmed at the angle of inclination of the helicopter, as the normal attitude is about 20° nose down. If the cable parts, or is released under tension, the helicopter, because of basic flight characteristics, goes into a climb, even though in a nose down attitude.

TURNING DIFFICULTIES

Turning difficulties will be the pilot's greatest concern during the operation. You may see the helicopter slack the tow before making a turn, particularly to the left. This is sometimes necessary in certain wind conditions due to insufficient left rudder remaining while under tension of the tow. After a new heading is assumed, the tension will be reapplied and towing continued. You will generally be requested, by voice radio, to assist in the turn with your rudder—if possible.

It has been found that although this specialized towing equipment will not satisfactorily tow a small outboard, they can be most readily towed by attaching a light line to a fitting on the helicopter deck, through the cabin door, to the boat. With this arrangement the helicopter flies sideways to effect the tow, since only short distance tows would be attempted. The pilot has a clear picture of his tow and slow speeds are possible with less effort and practically no danger.

The maximum time you can expect to be towed by helicopter, if the occasion should demand, will not exceed 1 hour, as the fuel consumption is quite high at the power output necessary in the operation. The towing of vessels by helicopter requires no greater precautions by vessel personnel than towing by other means, but the arrival speed of the helicopter should provide you, under most circumstances, with earlier assistance than could be attained by another means.

We in the Coast Guard are continually searching for improved methods and equipment with which to provide, in our total job, the "safety of life and property at sea" for which the Service is dedicated. If a better, or safer "mousetrap" for these purposes is made, we shall make an early investigation of its capability toward fulfillment of our motto, "Semper Paratus."

STANDING ORDERS

In view of the considerable interest in the subject of radar and its operating procedures voiced at the recent SOLAS Convention, and the publication of the "Radar Annex" to the Convention, the Coast Guard has solicited the Standing Orders and/or Radar Instructions for Deck Officers from various steamship companies. These will be printed from time to time in the PROCEEDINGS for information as a matter of general interest to our readers.

The following has been received from *Moore-McCormack Lines*:

NIGHT ORDER BOOKS: At sea the Master shall keep a Night Order Book which shall provide standing and nightly orders for the guidance and compliance of the watch officers. The night orders must be prepared before the Master turns in for the night for every date on which the vessel is not secured to a dock or pier.

The Standing Night Orders will consist of those which the Master considers applicable to any and every night at sea, and these will be written in ink at the beginning of the Night Order Book and need not be repeated while the particular book is in use. All watch officers shall be required to read these and to acknowledge same by signature immediately following. Copy of Standing Orders originated by one of our pre-war Masters for his vessel follows as an indication of what is required:

STANDING NIGHT ORDERS

KEEP A GOOD LOOKOUT: As a Watch Officer of this vessel you are expected to keep a good lookout, first, last, and all the time, and to see that those placed under you do the same. Do not stay in the Chart Room for long periods. **CALL ME AT ANY TIME FOR ANY REASON:** whenever you are in doubt. **CHECK THE COMPASSES EVERY HALF HOUR:** for in these vessels we have frequent variations in voltage, and should the Gyro fail or deviate we want to know it.

COME ON WATCH FIVE MINUTES EARLY: study the chart, the light lists, the tide tables and the Radio Aids to Navigation, the contour of the bottom, and the trend of the coast line, memorize the facts that will help you during the watch.

AFTER BEING RELIEVED REMAIN ON THE BRIDGE: for a few minutes until the officer who relieved you has the feel of things, and his eyes have become accustomed to the darkness, also give him a quick synopsis of happenings if any during your watch.

TAKE AN INTEREST IN THE NAVIGATION OF THE VESSEL: remembering that you as watch officers of today are the Masters of tomorrow, and that part of your compensation here is the valuable experience acquired. Never take it for granted that because the Master set the course it is a guarantee that the vessel cannot get into trouble during the four hours that you are in charge on the Bridge. **KEEP ON YOUR TOES.**

THICK WEATHER, HEAVY RAIN, SNOW OR LOW VISIBILITY: put the telegraph on "Standby" and sound your whistle or siren, reduce speed if necessary, or stop; also reassure yourself that the lookouts are at their stations; watch the rangelight for "mistings" and as the visibility decreases, call me.

SOUNDINGS WITH THE FATHOMETER: when on soundings, take frequent soundings, noting the results in the sounding book, also the time that you crossed the various curves of depths shown on the chart. Watch out for persistent strays.

RADIO DIRECTION FINDER BEARINGS: must be taken at frequent intervals whenever you are within range of the beacons, entering the results in the log.

MEETING OR PASSING OTHER VESSELS: give them a wide berth, and never try to bluff another vessel out of her right of way; make a study of trade routes, because a knowledge of where the other vessel is bound will often save you long embarrassing detours. Watch out for small craft and fishermen; many of them do not carry lights, and others show them only when you are upon them.

DURING HEAVY WEATHER: or spray coming aboard, shut off the electric blowers to the cargo spaces, forward, aft, or all over the ship if necessary, then when the weather has moderated, have them turned on again. Always check up to make sure that all the doors to the resistor houses on deck, and the entrances leading down through the poop are closed and dogged tight; otherwise your carelessness may ruin valuable electrical equipment. **WATCH THIS.**

REMEMBER THE INTAKES TO THE AIR FILTERING SYSTEM: cover the weather side with the canvas screens provided or you will ruin the filters; covering both without opening the Gyro room doors will burn up the blower motors located in the rooms below.

KEEP YOUR EYES AND EARS OPEN WHILE ON WATCH: be alert, and should you hear a door slamming below as the ship rolls, have it secured; if it rains or a heavy dew forms, take in the cushions and the robes from the passengers deck chairs. Have ports secured also, and be sure to open them again after the rain passes.

MAKE A ROUND OF THE DECK WHEN RELIEVED, ALSO PUBLIC ROOMS: during boisterous weather, especially so when running on the coasts with the booms up, for a guy may be poorly belayed and get adrift when the roll increases.

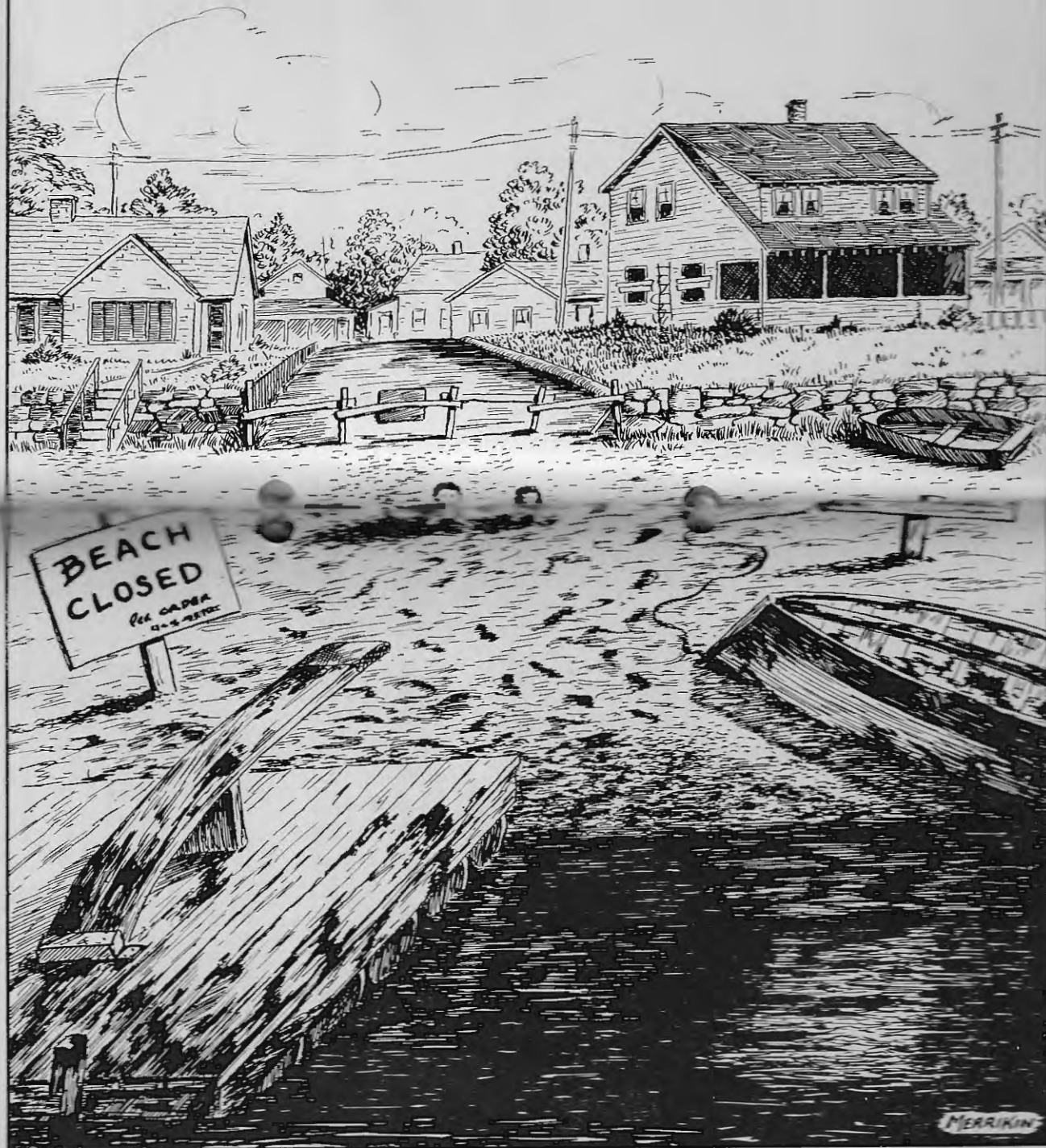
The night orders shall be written in ink and shall contain information and orders for the conduct of the voyage from 8 p.m. until 8 a.m. the following morning or until the Master is up and about for duty.

These orders shall state the 8 p.m. position, the courses to be steered (true, gyro, magnetic standard and steering, with the compass error and leeway used); the speed to be made by engine and estimated speed over the ground; the lights or other aids to navigation it is expected to sight, the anticipated time of sighting, the expected bearing, and the characteristics of each; the proximity of land, derelicts, ice, shoals or any other known dangers; the proximity of banks over which soundings might be obtained and instructions for use of the fathometer; instructions for use of the radio direction finder; warning as to traffic which may be met; and any other instructions necessary for the safe navigation of the vessel.

When approaching land or any other danger, the Master shall plot the 8 p.m. position and the courses to be followed on the chart, and the Officer of the Watch must be required to consult the chart and read and sign the Night Orders before reporting ready to relieve.

If the Master is incapacitated or for any reason prevented from writing the Night Orders before 8 p.m., they shall be written by the Chief Officer. Watch Officers are hereby instructed, in case the Night Orders have not been written before they go on watch, to so notify the Master, to enter the circumstances in the deck log, and to report same in writing to the Home Office.

POLLUTION AT WORK



DON'T LET THIS HAPPEN!



MARITIME SIDELIGHTS

The last major construction project in a \$21 million expansion of South Carolina's ports has now been completed. A new terminal in the port of Charleston has more than 375,000 square feet of transit shed space and a dock 1,800 feet long and 45 feet wide. Four ships can be berthed simultaneously in this new \$9.7 million facility.



Results of a Container Transport International, Inc. sponsored survey have shown that shippers, forwarders, steamship lines, truckers and railroads all over the world are definitely interested in setting up a container pool according to Mr. Jerome Slater, vice president of CTI as reported in the *Journal of Commerce*.

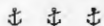


The new cargo liner, *James Lykes*, set a new record for the trans-Pacific crossing from Yokohama, Japan, to the U.S. Gulf, according to *Lykes Fleet Flashes*. The vessel docked in Galveston, Texas 21 days after sailing from Japan to set the new record even though it had been delayed approximately 12 hours due to congestion in the Panama Canal. The *James Lykes* was the first of *Lykes Line's* ships replacement program under which 53 new vessels are to be constructed.



A noise-level survey is being conducted aboard all vessels operated by the Military Sea Transportation Service. Surveys have already been completed aboard the P-2-class passenger vessels.

The object of the program is to prevent damage to ship personnel assigned in areas with high-noise levels.



The naval architectural firm of MacLear & Harris has contracted to design a special 45-foot powered catamaran made of aluminum for use by the Army's Corps of Engineers in making operations in Great Lake area waters.

NEW ESSO TANKER



THE 48,800-ton supertanker *Esso Boston* has joined the Esso Fleet. The 740-foot vessel was launched September 28, following her sistership, the *Esso Baltimore*, by exactly five months. The two ships were the 38th and 39th built for Esso Standard by the Newport News Shipyard in the last 47 years.

The ship's air-conditioned living quarters feature individual rooms for each crew member. She is equipped with an elevator, from the engine room to the upper deck.

In spite of her size, the *Esso Boston's* beam of 102 feet will allow her to transit the Panama Canal. She was built in 10 months and 11 days from keel laying to delivery.

The mystery of how 520 sacks of mail stowed in a Liberty ship went undetected for 15 years still defied solution on October 31, according to the marine press. The only thing the Post Office knows for sure is that the mail—which was in a sealed-off compartment and bound for Chile—is in Post Office custody. Since its discovery in a sealed-off compartment in the *John Bidwell* October 20 by a wrecking crew of the Northern Metal Co. in Philadelphia, nothing but question marks have cropped up. The mail shipment consists primarily of printed matter, but contains also some first-class letter mail. All of it was reported to be in excellent condition. It will not be opened in the inquiry, authorities said.

October shipping activities at San Francisco Bay and river ports reached a level not attained since World War II, according to the San Francisco Marine Exchange, Inc. Surpassing the record months of October 1952 and May 1960, October's ship movements in and out of the Golden Gate totaled 927, with a corresponding net tonnage of nearly five million—a 2% increase over last May's record-breaking tonnage.



Israel's Ministry of Transport has invited 16 foreign and 3 Israeli firms to submit detailed bids on the construction of the country's new port of Ashdod, 20 miles south of Tel Aviv.

RENEWAL OF DECK OFFICERS' LICENSES

RULES OF THE ROAD EXERCISE

The procedure whereby deck officers actually engaged in their profession will renew their licenses was explained in the November issue of the PROCEEDINGS and in Navigation and Vessel Inspection Circular 7-60. The multiple-choice-type questions, which are to be answered as a demonstration of the deck officers' knowledge of the Rules of the Road, will be reprinted here until all of the questions contained in the exercise have been used.

INTERNATIONAL RULES OF THE ROAD

True—False

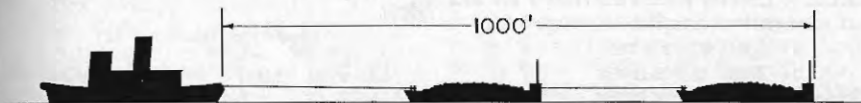
11. A vessel under sail displaying the black day signal sketched should be regarded as a power-driven vessel.



- (a) True
- (b) False

(See Rule 14)

12. If you sighted the towboat at night as sketched below, you would see looking from abeam:



- (a) Two white lights in a vertical line and a red side light
- (b) Three white lights in a vertical line

15. Whistle signals to denote course changes must be sounded:

- (a) In fog
- (b) When vessels are in sight of one another
- (c) When you can be reasonably sure of hearing the other vessel's acknowledgement
- (d) Every time you alter course

(See Rule 28)

13. In fog, a power-driven vessel, hearing forward of the beam another vessel which cannot be seen, must wherever possible:

- (a) Put the engines on standby
- (b) Reduce to one-half speed
- (c) Reduce to slow speed
- (d) Stop her engines

(See Rule 16)

14. In fog, a bell forward and a gong aft must be sounded by anchored vessels whose length is over:

- (a) 200 feet
- (b) 250 feet
- (c) 300 feet
- (d) 350 feet

(See Rule 15)

16. One of the following statements is correct if A and B are in sight of one another:



- (a) "A" and "B" should each alter course to the right, each blowing one short blast on the whistle
- (b) "A" and "B" should each alter course to the right. No whistle signals need be sounded
- (c) "A" or "B" should blow one blast and wait for a response before altering course

(See Rule 18 and Rule 28)

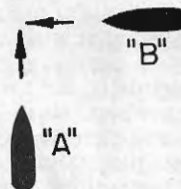
INLAND RULES OF THE ROAD

11. "My engines are going full speed astern" is indicated on the whistle by:

- (a) One short blast
- (b) Two short blasts
- (c) Three short blasts
- (d) Four short blasts

(See Article 28)

12. If you were in charge of navigation of "A," you should not:



- (a) Go under stern of "B"
- (b) Back down on engines
- (c) Stop
- (d) Cross ahead of "B"

(See Article 22)

13. If you were in charge of navigation of "B" you should:

- (a) Go under stern of "A"
- (b) Back down on engines
- (c) Stop
- (d) Hold course and speed

(See Article 21)

14. When collision cannot be avoided by "A" alone, "B" must:

- (a) Cross under "A" 's stern
- (b) Back down
- (c) Hold course and speed under all circumstances
- (d) Take such action as will best aid to avert collision

(See Article 27)

SEE ILLUSTRATION OF QUESTION 12 FOR ANSWERING QUESTIONS 13 AND 14

GREAT LAKES RULES OF THE ROAD

WESTERN RIVERS RULES OF THE ROAD

11. A sailing vessel under way makes her fog signal on:

- (a) Bell
- (b) Gong
- (c) Whistle
- (d) Foghorn

(See Rule 14)

12. The two vessels sketched are governed by the _____ rule:



- (a) Overtaking
- (b) Meeting end on
- (c) Crossing
- (d) Approaching

13. Match the vessel with the fog signal.

(a) Four bells at intervals of one minute, sounded in the same manner in which four bells are struck in indicating time

(b) One blast on the foghorn every minute

(c) At intervals of not more than 2 minutes a rapid ringing of the bell for from 3 to 5 seconds and, in addition, at intervals of not more than 3 minutes one short blast, two long blasts, and one short blast in quick succession on the whistle

(d) A screeching or Modoc whistle for from 3 to 5 seconds every minute

(e) Three distinct blasts of the whistle every minute

A. a steam vessel under way

B. a steamer with a raft in tow

C. a sailing vessel on the starboard tack

D. a steam vessel aground in or near a channel or fairway

E. a vessel in tow

(See Rule 14)

14. Which of the circles sketched below has a white sector which best represents the arc of visibility of the foremast light?



(See Rule 3(a))

15. Approaching a bend where the channel around the bend is obscured a steam vessel should blow on the whistle:

- (a) One distinct blast
- (b) Several short and rapid blasts, not less than five
- (c) One blast of at least 8 seconds' duration
- (d) Three long blasts

(See Pilot Rule 90.6)

16. A steam vessel when leaving her dock should sound on the whistle:

- (a) One distinct blast
- (b) Several short and rapid blasts, not less than five
- (c) One blast of at least 8 seconds' duration
- (d) Three long blasts

(See Pilot Rule 90.7)

17. If your one blast signal was answered with two blasts, you:

- (a) Again blow one blast
- (b) Reply with two blasts
- (c) Blow the danger signal
- (d) Blow three short blasts

(See Pilot Rules 90.3 and 90.4)

18. Incorrectly answering a two blast signal with one blast, or incorrectly answering a one blast signal with two blasts is known as:

- (a) Reverse signals
- (b) Reciprocal signals
- (c) Cross signals
- (d) Danger signals

(See Pilot Rule 90.3)

19. When passing within 200 feet of a Coast Guard vessel servicing an aid to navigation, maximum speed is:

- (a) 1 mile per hour
- (b) 3 miles per hour
- (c) 5 miles per hour
- (d) 7 miles per hour

(See Pilot Rules 90.15a)

20. Two black balls in a vertical line indicate a vessel that is:



- (a) In distress
- (b) Not under command
- (c) Fishing
- (d) Servicing aids to navigation

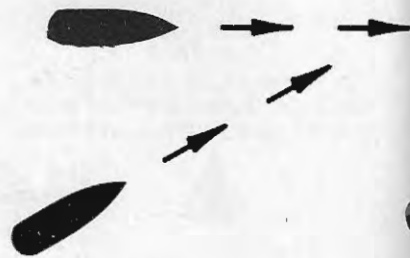
(See Rule 30)

11. If an ascending steamer makes no signal by the time a descending, approaching steamer is within one-half mile, the descending steamer blows first:

- (a) One distinct blast
- (b) Two distinct blasts
- (c) Four or more short and rapid blasts
- (d) One long blast

(See Rule Numbered 18)

12. If in overtaking another vessel as sketched you occasionally saw her mast lights and green side lights:



(a) The other vessel must keep clear of you

(b) You and the other vessel share equally the responsibility for keeping clear

(c) You should assume that it is your duty to keep clear

(d) You must alter course to the left

(See Rule Numbered 22)

13. The two white lights displayed as sketched would indicate at night that:



(a) The vessel is not under command

(b) The vessel is over 150 feet in length and is at anchor

(c) The vessel is under 150 feet in length and is at anchor

(d) It is a pilot vessel

(See Rule Numbered 13)

MATHEMATICS

Carelessness—ADDS to your troubles

SUBTRACTS time from your life

MULTIPLIES your aches and pains

DIVIDES your earning potential

(Courtesy Lykes Lines Safety Bulletin)

LEGAL CONSEQUENCES OF THE NEW RULES OF THE ROAD

By Paul A. Reyff

PROPOSALS for new Rules of the Road have come out of the Safety of Life at Sea Conference held in London last June. These recommendations, officially entitled "Regulations For Preventing Collisions At Sea," are revisions and additions to those adopted after the 1948 Conference. They are now being considered by the Government and the Maritime Industry of each nation concerned, but, if the history of the 1948 revisions is any guide, will not be enacted before 1965.¹

PROPOSED RULES OF THE ROAD

The proposed Rules of the Road have been awaited with special interest because of the fact that one of the key elements of modern navigation, Radar, has never before been directly considered in the framing of these regulations. Because Radar has figured prominently in many recent collision cases, important decisions concerning Radar navigation were anticipated. This is precisely what has happened.

Three important references in the new Convention have been made to Radar. The Preliminary to Part C outlines the general attitude toward its use. The famous Rule 16, which specifies actions to be taken in restricted visibility, now includes a third paragraph, (c), which refers unmistakably to the Radar situation. And following the last Rule, 31, is a special annex entitled, "Recommendations to the use of Radar information as an aid to avoiding collisions at sea." These three sections comprise important statements of both limitations and advantages of Radar in marine navigation, and it is the purpose of this paper to bring out their implications.

THE RULES AS THEY AFFECT RADAR

I. Radar information of range and bearing does not constitute the ascertaining of another ship's position as would excuse a failure to stop engines upon hearing forward of the beam a fog signal of another vessel whose position has not been visually ascertained.

II. Radar information, nevertheless, may be used as the basis for taking

action to avoid a close-quarters situation.

III. Radar information is one of the circumstances to be considered in determining moderate speed in restricted visibility, and will in some cases require a vessel to further limit its speed, even below that "moderate speed" required by visual or audible information.

IV. Radar information must be developed, beyond range and bearing, into the form of a graphical or numerical presentation if it is to be used as the basis for any avoiding action.

In the following remarks I shall first elaborate on these interpretations of the SOLAS proposals, and then develop the legal and practical consequences of each.

Rule 16(b) is identical to the present rule:

"A power-driven vessel hearing, apparently forward of her beam, the fog signal of a vessel, the position of which is not ascertained, shall, as far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over."

This critical Rule is further clarified by the following two paragraphs, the first from the "Preliminary" to the rules concerning sound signals and conduct in restricted visibility, and the second from Item (3) in the Annex to the Rules:

"The possession of information obtained from Radar does not relieve any vessel of the obligation of conforming strictly with the Rules and, in particular, the obligations contained in Rules 15 and 16."

"When navigating in restricted visibility, the radar range and bearing alone do not constitute ascertainment of the position of the other vessel under Rule 16(b) sufficiently to relieve a vessel of the duty to stop her engines and navigate with caution when a fog signal is heard forward of the beam."

Despite some possible ambiguities in wording, which will be discussed shortly, there would seem to be no doubt about the intention of Item (3) of the Annex. Taken together with the abovementioned paragraph from the Preliminary, the meaning is clear: the engines *must* be stopped and the vessel navigated with caution upon the hearing of a fog signal forward of the beam. In the past few years, Admiralty Court opinion has defi-

nately leaned in this direction, with little exception.² The U.S. Coast Guard has continually held that a vessel does not "see" another by Radar.³ Item (3) of the Annex would certainly confirm this opinion in any future case.

Certain possible misunderstandings of the wording, however, should be noted here. The phrase "radar range and bearing alone" might be misinterpreted to imply that *other* information developed from radar may permit ascertainment under Rule 16(b), such other information being, of course, the graphic presentation of course and speed known as plotting. There are two reasons why, under present conditions at least, such an interpretation would be in error.

In the first place, it is highly unlikely that information developed from "unallowed" information could be legally countenanced. In other words, a court could hardly be expected to recognize "ascertainment" by plotting when plotting is postulated upon the assumption that the contacted vessel is proceeding on a steady course and at a steady speed, and her immediate aspect and future maneuvers are inferred from real information on her past and present ranges and bearings only. This is not, of course, to underestimate the value of plotting.

In the second place, although the use of the word "alone" seems to leave the door open for the interpretation that engines need not be stopped if radar information is developed beyond range and bearing, this impression is countered by the fact that radar information, at least in its present state, cannot be entirely complete. The existence of a pip on the scope implies the existence of an object corresponding to it; but the non-existence of a pip on the scope does not imply the absence of objects around the vessel. A blank scope is no information at all. As the last sentence of Item (2) in the Annex points out, "it must be recognized that small vessels, small icebergs, and

² In *Weyerhaeuser SS Co. v. U.S.*, 174 F. Supp. 663, District Judge Roche rules that the "ascertainment" of a vessel's position by radar is adequate justification for failure to comply with the technical requirement that engines be stopped."

³ *Proceedings of the Merchant Marine Council*, July 1960, p. 122.

similar floating objects may not be detected by Radar.”⁴

There is also possible ambiguity in the use of the word “sufficiently” in Item (3). In the writer’s opinion, there is no implication in the use of this word that radar information of range and bearing *would be* sufficient to relieve vessels of other duties under other Rules, chiefly the duty of maintaining moderate speed under Rule 16(a). (See III.)

The practical consequence that can be drawn from Rule 16(b) is that if a vessel is to avoid the stopping of her engines, she must take early action so as to ensure a CPA beyond “whistle” range. And this brings up directly to Point II and Rule 16(c).

Rule 16(c) reads as follows in the proposed Regulations:

“A power-driven vessel which detects the presence of another vessel forward of her beam before hearing her fog signal or sighting her visually may take early and substantial action to avoid a close-quarters situation, but, if this cannot be avoided, she shall, so far as the circumstances of the case admit, stop her engines in proper time to avoid collision and then navigate with caution until danger of collision is over.”

⁴The advent of nuclear-powered vessels and hydrofoils, designed for speeds of 60, 80, or even 100 knots, may raise a dilemma concerning radar ascertainment. The economic advantages of such high-speed vessels will be compromised by Rule 16(b) far more than will vessels of present-day speeds. If speed is to be limited by “visual” visibility, then fog must be banished!

ABOUT THE AUTHOR



PAUL A. REYFF is the former Director, Radar Training Branch, Maritime Administration (Pacific Coast District), U.S. Department of Commerce. He established the Pacific Coast District Radar School in San Francisco, and has served as Instructor in radar training since 1958. Previously, Mr. Reyff was a licensed officer in the U.S. Merchant Marine and Destroyer Division Staff Operations Officer in the U.S. Navy. A graduate of the California Maritime Academy (B.S.) and San Francisco State College (M.S.), he has written extensively on both the technical and legal aspects of Radar. Presently, Mr. Reyff is a consultant on training with the U.S. Department of Labor in Washington, D.C.

Now it appears evident that the principal means of detecting the presence of another vessel before fog signals are heard, or before sighting her visually, is Radar. In short, Radar information by itself may be used as the basis for taking avoiding action.

The close-quarters situation referred to could be reasonably interpreted in two, quite complementary ways. As a practical matter, it has been commonly assumed that a close-quarters situation exists when: (a) in navigable waters (no fixed obstructions or land closer than 5 miles), the Closest Point of Approach is less than 2 miles; or when (b) in all other cases, another vessel’s fog signal is heard.⁵ Such a rule of thumb provides a “starting point” for plotting so as to effect a desired CPA in taking avoiding action. A second definition may be derived from the Rules themselves, namely, that a close-quarters situation exists at the point at which other Rules take over, e.g., 16(b).

The wording of Rule 16(c), if further examined, indicates that early avoiding action on the basis of radar information is not only permissible, but even required. Though the auxiliary verb in the first clause is “may,” the verb used in the following clause—which sets forth action to be taken under conditions the reverse of those mentioned in the first clause—is “shall”; and the use of the phrase “cannot be avoided” implies that if the close-quarters situation *can* be avoided, it should be (and on the basis of radar information). How the avoiding action is to be accomplished is outlined in detail in the Annex.⁶

In any case, Rule 16(c) for the first time recognizes radar as a source of information *in its own right* in the

prevention of collisions. As such, it goes somewhat beyond what had been predicted of the Conference by some observers.⁷ In short, radar is here acknowledged as *the best available substitute for vision*,⁸ when vision is lacking, in the avoidance of dangerous situations.

“One should keep clearly in mind the fact that radar provides an instantaneous indication of *present* distance and *present* direction of a contact. It does *not* identify the contact as a ship or even as a moving object nor does it, in general, *directly* indicate the course or speed of another vessel, or its aspect. It gives no reliable information as to the size and type of the contact. It provides no immediate indication of a change of course or speed by another vessel. It does not reveal the intent of another vessel, or even the probable intent because it provides no clue as to whether the other vessel is equipped with radar, whether the bridge personnel of the other vessel has sized up the situation the same as personnel on own ship, or whether the other vessel is even aware of the presence of own ship. In short, radar is *not* the equivalent of visual observation.” *Radar Plotting Manual*, H.O. Pub. No. 257, 1960, p. 2.

Radar was granted further recognition as a substitute for vision in the determination of moderate speed.

Rule 16(a) reads as follows:

“Every vessel, or seaplane when taxiing on the water, shall, in fog, mist, falling snow, heavy rainstorms, or any other condition similarly restricting visibility, go at a moderate speed, having careful regard to the existing circumstances and conditions.”

Item (2) of the Annex states:

or nearly opposite courses, is generally preferable to an alteration to port.

“(7) An alteration of speed, either alone or in conjunction with an alteration of course, should be substantial. A number of small alterations of speed should be avoided.”

“(8) If a close-quarters situation is imminent, the most prudent action may be to take all way off the vessel.”

“Intergovernmental Maritime Consultative Organization and the Safety of Life at Sea Conference,” Charles H. Vaughn, C. Adm. Counsel, U.S. Navy, *Proceedings of the Merchant Marine Council*, June 1960, p. 1.⁹ had expressed the hope that Radar Rule would be considered conservatively, *repeating the misleading quip* that “radar is only one of many aids to navigation available today.” In the writer’s opinion it is the single greatest aid to navigation since the compass, and has been so recognized by most observers. Its misuse is another matter, and pessimism concerning its value can only perpetuate further misuse.

⁸Radar can never be a substitute for vision because it does not provide aspect. When visibility is lacking, radar is the best available guide, but it can never be the equivalent of a visual observation.—Ed.

⁵The British Admiralty’s *Manual of Navigation* defines the close-quarters situation as passing within 2 miles in open sea.

⁶See IV. The Annex, (4) through (8), reads as follows:

“(4) When action has been taken under Rule 16(c) to avoid a close-quarters situation, it is essential to make sure that such action is having the desired effect. Alterations of course or speed, or both, are matters as to which the mariner must be guided by the circumstances of the case.

“(5) Alteration of course alone may be the most effective action to avoid close quarters provided that:

“(a) There is sufficient sea room.

“(b) It is made in good time.

“(c) It is substantial. A succession of small alterations of course should be avoided.

“(d) It does not result in a close-quarters situation with other vessels.

“(6) The direction of an alteration of course is a matter in which the mariner must be guided by the circumstances of the case. An alteration to starboard, particularly when vessels are approaching on opposite

ch, "A vessel navigating with the aid of radar in restricted visibility must, in compliance with Rule 16(a), go at a moderate speed. Information obtained from the use of radar is one of the circumstances to be taken into account when determining moderate speed. In this regard it must be recognized that small vessels, small icebergs, and similar floating objects may not be detected by radar." Historically, "moderate speed" has meant a speed which a prudent mariner would order in the circumstances, such as the extent of visibility and likelihood of meeting other vessels in the vicinity; when other vessels are known to be in the vicinity, or when there is a likelihood of meeting other vessels, moderate speed is that in which it is possible to stop within half the distance of visibility, measured from the forwardmost lookout.⁹ The above-cited paragraphs further define and limit "moderate speed" for a radar-equipped vessel. Radar information may provide indications that a moderate speed under all other circumstances is too fast. And although at first glance the Annex seems to permit latitude in the direction of greater speed on the basis of radar "vision," the final sentence of the first paragraph of (2), calling attention to the incompleteness of radar data (see also I., supra), seems to preclude any such interpretation.

The last and most significant alteration in the Rules concerns the use to which Radar data is put. It is the most significant because it represents, not a further restriction, but a positive step forward in electronic navigation.

Item (4) of the Annex states:

"When action has been taken under Rule 16(c) to avoid a close quarters situation, it is essential to make sure that such action is having the desired effect. Alterations of course or speed, or both, are matters as to which the mariner must be guided by the circumstances of the case."

The important words here are: "it is essential to make sure that such action is having the desired effect." The only presently known method for making sure that changes in course or speed will have the desired effect, and continue to produce the desired effect, is by a graphical or mathematical presentation of the radar data known familiarly as *plotting*. In short, the new Rules make it mandatory that plotting be performed.

Plotting has, of course, always been urged by the Coast Guard.¹⁰ In several major collisions of the past few years, the failure to maintain an adequate plot has been held contributory to the tragedy.

If there ever existed an excuse to downgrade the importance of plotting, there is certainly no legal or practical one now. And the plotting referred to in the Rules is of the type requiring considerable training and accuracy, because an alteration of one ship's course or speed, or both, are involved. It should be pointed out that this is not the place for a grease pencil plot on the reflection plotter, which can prove valueless after a slight change of course, and which is fairly crude under difficult maneuvering conditions.¹¹

The new U.S. Coast Guard Regulations have virtually foreseen this situation by requiring that all Masters and Mates serving on radar-equipped vessels must have been certificated by May 1, 1962, as Radar Observers. Whether or not Pilots will be covered by this ruling is yet to be decided; but anyone in charge of conning (as is a Pilot entering port) is certainly responsible for the safe navigation of the vessel.

If there is any justification for the continued use of the phrase "radar-assisted collisions," it is in the case of collisions following the "dance of death"¹² wherein both ships steer a collision course on the basis of undeveloped radar information. Let us hope that the day is gone forever when a radar observer takes action on the basis of "observing" a series of pips, or even a single pip, on the scope.

The proposals of the SOLAS Conference, 1960, if and when adopted, will do much to clear the air concerning Radar navigation. There is no doubt but that Radar can perform an outstanding service to safety at sea, if properly used; and the members of the Conference have placed great confidence in the expectation that it will be properly used.

In the not-too-distant future, every vessel of 100 feet or more in length

¹⁰ Radar: Its Hidden Dangers, *Electronics*, June 12, 1959, stated, "radar belongs in the chart room, not on the bridge or in the wheelhouse." The Coast Guard constantly emphasizes that course and speed of a target can be validly estimated only after plotting radar data on a chart." Devices have now been perfected, chiefly luminous radar plotting, to permit *chartroom work* on the bridge or in the wheelhouse, even at night.

¹¹ Maneuvering Board should be at least 18" in diameter—a small investment for great stakes. Cf. *Proceedings of the Merchant Marine Council*, January 1959, p. 7.

¹² Cf. "Radar Assisted Collisions," Stanley Wright, Esq., *Marine News*, December 1959.

can be expected to have radar; smaller vessels may be required to carry radar reflectors; a special officer will be trained to utilize radar work aboard ship. It is my experience that most masters prefer to have two Radars, one for standby; and, in general, that the maritime industry as a whole welcomes technological progress. In this age of technical achievement, ship owners and operators are aware that they are more than ever *legally* and *morally* responsible for the safety of life at sea, as they now have greater means at hand to ensure it.

AMENDMENTS TO REGULATIONS

[EDITOR'S NOTE.—The following regulations have been promulgated or amended since the last issue of the PROCEEDINGS. A complete text of the regulations may be found in the Federal Register indicated at the end of each article. Copies of the Federal Registers containing the material referred to may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D.C.]

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

[CGFR 60-75]

DEFINITIONS, MARINE WELDING, ELECTRICAL INDICATOR CIRCUITS, CASUALTY INVESTIGATION RECORDS, AND TEMPORARY EXEMPTIONS FROM NUMBERING REQUIREMENTS

The amendments in this document are editorial in nature to bring up-to-date certain names and cross references, change wording of a regulation so that requirements in the Code of Federal Regulations and a Coast Guard pamphlet will read the same, and remove from the Code of Federal Regulations those requirements which by their own terms have expired and no longer are in effect.

(Federal Register Document No. 60-11397; Filed Dec. 7, 1960, and printed Dec. 8, 1960)

SUBCHAPTER H—PASSENGER VESSELS

[CGFR 60-36a]

PART 75—LIFESAVING EQUIPMENT

Subpart 75.20—Equipment for Lifeboats, Life Rafts, Life Floats, and Buoyant Apparatus

⁹ *Sagamore*, 247 Fed. 743 (1917); *Erie, etc. v. Chicago*, 178 Fed. 42 (1910). See also *Griffin on Collisions*, p. 296, et seq.

The Coast Guard document CGFR 60-36 (F.R. document 60-10395) contained miscellaneous amendments to the vessel inspection regulations and was published as Part II of the FEDERAL REGISTER dated November 5, 1960. Among the changes set forth in this document were revised requirements for "painters" for lifeboats. In listing the required equipment for lifeboats for passenger vessels, Table 75.20-10(a) was reprinted in its entirety (25 F.R. 10627). The revised requirements were intended to include a change in the number of required "painters" from "1" to "2" for Great Lakes passenger vessels while no change in the quantity of "storm oil" required was contemplated. However, a mistake was made in Table 75.20-10(a) under the heading "Great Lakes" (fourth column), when the quantity for "storm oil" (opposite letter identification "y") was increased from "1" to "2" while no change is indicated for "painter" (opposite letter identification "z").

By virtue of the authority vested in me as Commandant, United States Coast Guard by Treasury Department Orders 120, dated July 31, 1950 (15 F.R. 6521), 167-9, dated August 3, 1954 (19 F.R. 5915), 167-14, dated November 28, 1954 (19 F.R. 8026), 167-20, dated June 18, 1956 (21 F.R. 4894), CGFR 56-28, dated July 24, 1956 (21 F.R. 5659), and 167-38, dated October 26, 1959 (24 F.R. 8857), and in accordance with the authority in R.S. 4405, as amended, 4462, as amended, 4426, as amended, 4488, as amended, 4491, as amended, secs. 1, 2, 49 Stat. 1544, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, and sec. 3, 68 Stat. 675 (46 U.S.C. 375, 416, 404, 481, 489, 367, 1333, 390b, 50 U.S.C. 198), the Table 75.20-10(a) in § 75.20-10(a), regarding required equipment for lifeboats (25 F.R. 10627), is amended in the fourth column under heading "Great Lakes" by changing "2" to "1" opposite letter identification "y" for item "oil, storm (gallons)," and by changing "1" to "2" opposite the letter identification "z" for the item "painter."

(Federal Register Document No. 60-12086; Filed Dec. 28, 1960, and printed Dec. 29, 1960)

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter I—Coast Guard, Department of the Treasury

SUBCHAPTER F—NAVIGATION REQUIREMENTS FOR WESTERN RIVERS

[CGFR 60-79]

PART 96—INTERPRETIVE RULINGS

Subpart 96.10—Steering and Sailing

MOVING A VESSEL FROM HER DOCK OR ANCHORAGE

An interpretive ruling designated 33 CFR 96.10-1(a), regarding the meaning of the phrase "when a steam vessel is moved from her dock, or anchorage" in Rule Numbered 24(c) (33 U.S.C. 349) of the Western Rivers Rules, was published in the FEDERAL REGISTER of October 8, 1960 (25 F.R. 9681). The Rule Numbered 24(c) reads as follows: "When a steam vessel is moved from her dock, or anchorage, she shall give the same signal as in the case of a steam vessel nearing a bend, but she and any approaching vessel shall be governed by rules 25 and 26 until her course is apparent, and then both vessels shall be governed by the other steering and sailing rules."

This interpretive ruling provided that the phrase "when a steam vessel is moved from her dock, or anchorage" should mean " * * * moving from a mooring to a riverbank or from a mooring of any type." Since then information has been received indicating that this interpretive ruling still leaves a doubt about what is meant because the phrase "mooring to a riverbank" may be construed as meaning either a "riverbank mooring" (which was the meaning intended), or it may express the relation of direction, approach and arrival, as from a "mooring" to a "riverbank." This Rule Numbered 24(c) requires a prescribed signal of three distinct blasts on her whistle shall be given when a vessel is "moved from her dock, or anchorage," and this phrase should be interpreted to mean when a vessel is "moving from a mooring of any type."

§ 96.10-1 Vessel moved from dock or anchorage.

(a) Rule Numbered 24(c) of section 4233 of the Revised Statutes as amended (33 U.S.C. 349), requires "when a vessel is moved from her dock, or anchorage," to give a prescribed signal of three distinct blasts on her whistle. The phrase "moved from her dock, or anchorage," includes moving from a riverbank mooring or from a mooring of any type.

(Federal Register Document No. 60-11874; Filed Dec. 22, 1960, and printed Dec. 23, 1960)

NOTICE

(a) The valid current certificates and/or registers issued by the National Cargo Bureau, Inc., with home office at 99 John Street, New York 38, New York, attesting to the tests and surveys of shipboard cargo gear

on a passenger, cargo, or miscellaneous vessel conducted by or for such Bureau, may be accepted as prima facie evidence of the condition and suitability of such gear by the Coast Guard when performing an inspection of a vessel as further described in 46 CFR Part 71.25-25 or 91.25-25. *Provided, That:*

(1) Such certificates and/or registers shall be maintained currently and shall indicate that the described shipboard cargo gear for the particular vessel described therein complies with the standards respecting shipboard cargo gear as set forth in the Convention Concerning the Protection Against Accidents of Workers Employed in Loading or Unloading Ships (Revised) (International Labor Organization Convention No. 32); and,

(2) The dates when such tests or surveys were conducted, together with the signatures or initials of the competent persons performing them shall be recorded therein.

(b) This approval and permission to accept valid current certificates and/or registers of the National Cargo Bureau, Inc., shall become effective on the date of publication of this document in the FEDERAL REGISTER and shall be in effect until suspended, amended, or canceled by proper authority.

(Federal Register Document No. 11941; Filed Dec. 23, 1960, and printed Dec. 24, 1960)

EQUIPMENT APPROVED By THE COMMANDANT

[EDITOR'S NOTE.—Due to space limitations, it is not possible to publish the documents regarding approvals and terminations of approvals of equipment published in the Federal Register dated December 22, 1960 (CGFR 60-78) and December 24, 1960 (CGFR 60-77). Copies of these documents may be obtained from the Superintendent of Documents, Washington 25, D.C.]

ARTICLES OF SHIPS' STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from 1 December to 31 December 1960, inclusive, for use on board such vessels in accordance with the provisions of Part 147 of the regulations governing "Explosives or Other Dangerous Articles on Board Vessels" are as follows:



"HAVN'T HAD A SLIPPING INJURY
SINCE WE USED GROUND WALNUT
SHELLS IN THE SHOWER PAINT."



"MOST SAFETY CONSCIOUS BOSUN I'VE SEEN-
SOAKS HIS SOCKS IN HIGH VISIBILITY
RED - SO HE CAN FIND 'EM IN THE DARK!"