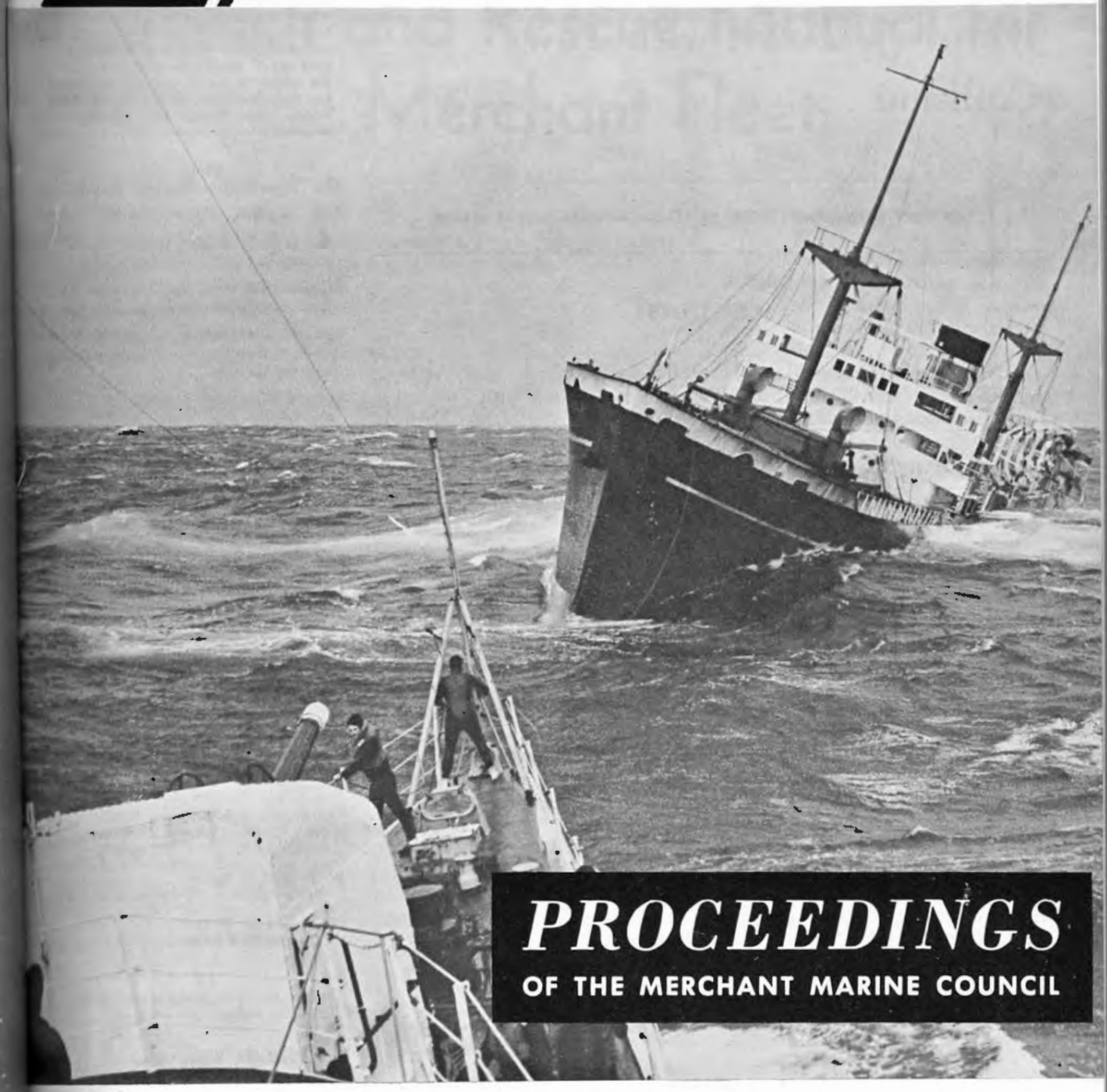
COAST GUARD



PROCEEDINGS
OF THE MERCHANT MARINE COUNCIL

Vol. 28, No. 4 CG-129 April 1971

IN THIS ISSUE . . .

A Search and Rescue Manual for the Merchant Fleet . . .

SS *Union Faith* (Taiwan) and Tug *Warren J. Doucet* with Tow Collision . . .

PROCEEDINGS

OF THE

MERCHANT MARINE COUNCIL

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THIS COPY FOR NOT LESS THAN 20 READERS—PLEASE PASS IT ALONG

CONTENTS

COVERS

FRONT COVER: The British Motorship *Ambassador* transmitted an S.O.S. from the North Atlantic when she began sinking. Fourteen men later lost their lives when two liferafts capsized in the heavy seas. With four Merchant Ships responding to the call, in addition to the Coast Guard Cutter *Coos Bay* (in the foreground of this photograph), use of MERSAR techniques might have aided in the initial search for survivors.

BACK COVER: In this photograph of another historic situation where MERSAR might have proven useful, the tanker SS *Fort Mercer* begins to sink rapidly as survivors are pulled in liferafts to the Coast Guard Cutter *Yakutat*.

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C: abcdefgimnou(1)
D: i(5);abdeklmnsuvx(1)
E: d(1)
F: p(1)
Lists 141M,CG–13,CG–20

A Search and Rescue Manual for the Merchant Fleet

The Merchant Ship Search and Rescue Manual (MERSAR) has been prepared and issued by the Intergovernmental Maritime Consultative Organization (IMCO). The preparation of this publication was recommended by the United Kingdom in 1968 and a first draft submitted to the Maritime Safety Committee (MSC) of IMCO by that country. At the invitation of the Commandant, U.S. Coast Guard, a working group of the MSC met in two sessions during 1969 at the National Search and Rescue School to prepare a final draft. This draft was circulated by IMCO to member countries for comment and recommendations. Early in 1970 the MSC acted upon the draft submitted by the working group and the recommendations of the member countries.

MERSAR is designed to meet requirements of ship masters when they become involved in a search and rescue operation at sea. Accordingly, the contents of this book provide valuable information for meeting this situation. However, the procedures contained therein have been designed not only to meet the special requirements of ship masters but also to achieve the highest possible degree of conformance with procedures used by search and rescue forces throughout the world. The publication contains an introduction and seven chapters as follows:

INTER-GOVERNMENTAL
MARITIME CONSULTATIVE ORGANIZATION

Merchant Ship Search and Rescue Manual

(MERSAR)

LONDON

Chapter 1—Coordination of Search and Rescue Operations

Chapter 2—Action by a Ship in Distress

Chapter 3—Action by Assisting Ships

Chapter 4—Planning and Conducting the Search

Chapter 5—Conclusion of Search

Chapter 6—Communications

Chapter 7—Aircraft Casualties at Sea

SAR Coordination

The procedures established by MERSAR for coordination of search and rescue operations provide for two situations in which the ship master may be involved:

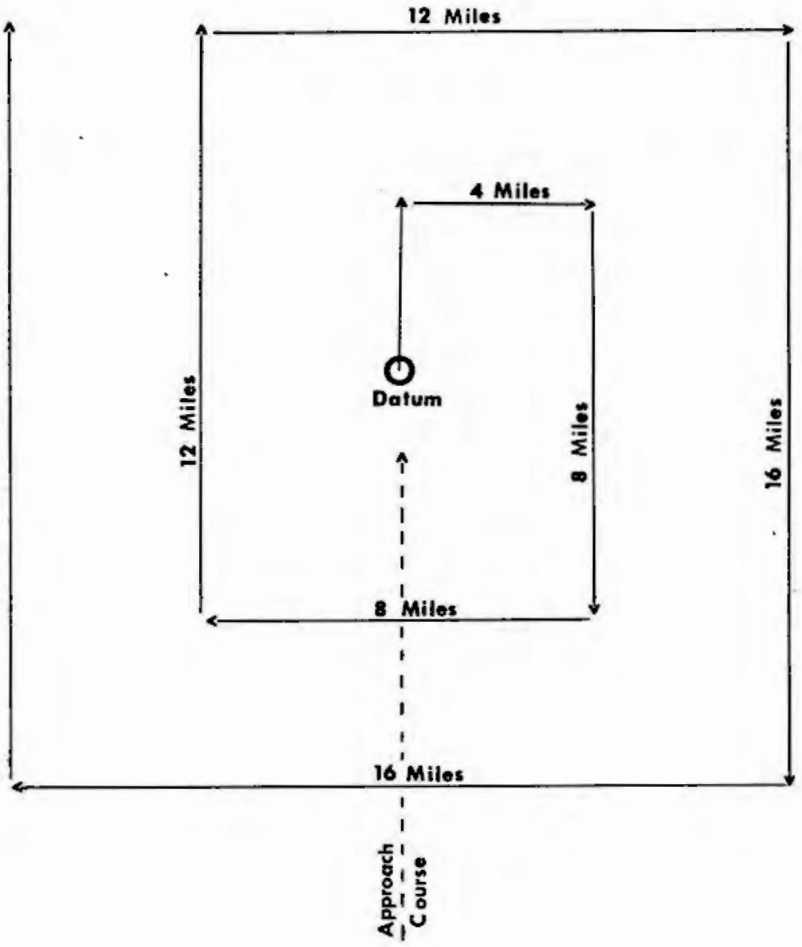
a. The situation where the merchant ship operates in conjunction with search and rescue forces and search and rescue authorities provide an On Scene Commander (OSC) to direct the operation of the merchant ships.

b. The situation where specialized search and rescue forces are not available to assume the duties of OSC but a number of merchant ships are operating on their own. In this case the procedure calls for the ships themselves to establish a Coordinator Surface Search (CSS). The manual provides detailed guidance to ship masters concerning the selection of the CSS and the responsibility of the ship master who assumes this task.

The coordination procedures also provide for a situation where merchant ships are engaged in a SAR operation under the direction of a CSS and SAR aircraft are present but, due to insufficient communications capability or some other reason, cannot act as OSC for the surface search. In this case, possibilities for direct communications between the ships and aircraft are suggested, as

PATTERN 1

EXPANDING SQUARE SEARCH PATTERN—1 SHIP



well as relay channels via coastal radio stations and land based search and rescue authorities.

Action by Merchant Ships

MERSAR provides guidance for ships in distress and assisting ships. Included in the guidance for ships in distress is advice which can facilitate assistance to them by SAR aircraft and helicopters. The latter is particularly valuable in those cases where personnel are evacuated from ships by helicopter hoist.

Additional guidance to the ship master is provided in the event that his ship is one of the assisting ships. This includes information on communications, preparations for search, preparations for rescue, and the special case of merchant ship assistance to aircraft casualties. Of particular interest is that the procedures provide for the use of international code signal "FR" as a visual identification of the CSS.

In chapter 4, which is excerpted later in this article, a simplified search planning procedure is established with guidance for ship masters who execute the responsibility of CSS and must plan a search on their own. This chapter also includes search patterns which have been simplified for merchant ship use and a list of code groups for use in conducting a coordinated search by merchant ships. It was found necessary to include some additional code groups which are not yet in the International Code of Signals. These will be proposed as additions to the International Code.

Conclusion of the Search

The procedures deal with the conclusion of search under the cases: Search Successful—Rescue and Search Unsuccessful — Termination of Search. This includes guidance on rescuing survivors, dealing with survivors after the incident, and information which can be used in making the decision to terminate an unsuccessful search.

Effect of MERSAR

Besides providing a standard for merchant ships in search and rescue operations, MERSAR will also be a valuable asset to search and rescue authorities for coordinating the activities of SAR units with merchant ships during an operation. Of particular importance to those who may be working with merchant ships is an understanding of the use of the term Coordinator Surface Search (CSS) when merchant ships are coordinating their operations. Of greater importance, however, are the standardized search patterns which are prescribed for merchant ships. When this manual comes into widespread use, it will only be necessary for an OSC to refer to the pattern number in MERSAR when requesting merchant ships to conduct a search; for instance: the desire to conduct a ship/aircraft coordinated search pattern could be conveyed simply by sending the message "MERSAR PATTERN 6 (followed by the desired ship's course and speed)." The six patterns provided by MERSAR are reprinted here for immediate information.

(The following are major excerpts from chapter 4, "Planning and Conducting the Search." These are re-

printed in an effort to provide essential information on this phase of search and rescue, but the complete manual should always be consulted before attempting to conduct a search. *The guidelines contained in this article should never take the place of the official manual.*)

CHAPTER 4

PLANNING AND CONDUCTING THE SEARCH

4.1 General

4.1.1 In order that surface units and especially merchant ships on scene will be able to search effectively, in conjunction with SAR aircraft when available, it is essential that search patterns and procedures should be pre-planned to enable merchant ships of all flags to co-operate in co-ordinated operations with the minimum difficulty and delay. To achieve this aim, a number of search patterns to meet varying circumstances have been established.

4.2 Responsibility of CSS

4.2.1 . . . It is the responsibility of the CSS to select and then to initiate in conjunction with assisting ships the most suitable search pattern.

4.2.2 It is equally the responsibility of the CSS to adjust the search pattern in view of subsequent developments which may include:

(a) Additional assisting ships arriving;

(b) Additional information;

(c) Weather conditions, visibility and daylight.

4.3 Definitions

4.3.1 The following definitions relate to the conduct and execution of search patterns:

(a) Datum

The most probable position of the search target at a given time, taking into account the expected effect of drift since the initial position of the incident was established.

(b) Drift

The estimated resultant of wind, current, and/or tidal stream that will cause a change in the position of the search target.

(c) Expanding Square Search Pattern

A type of search pattern suitable for a single ship which should search outward in expanding squares from the datum. (See pattern 1.)

(d) Sector Search Pattern

A type of search pattern suitable for a single ship in special circumstances (e.g., man overboard) in which the ship searches radially from datum using a system of sectors of a circle. (See Pattern 1a.)

(e) Parallel Track Search Patterns

Search patterns suitable for two or more ships in which all ships maintain parallel courses. (See Patterns 2, 3, 4 and 5.)

(f) Ship/Aircraft Co-ordinated Search Pattern

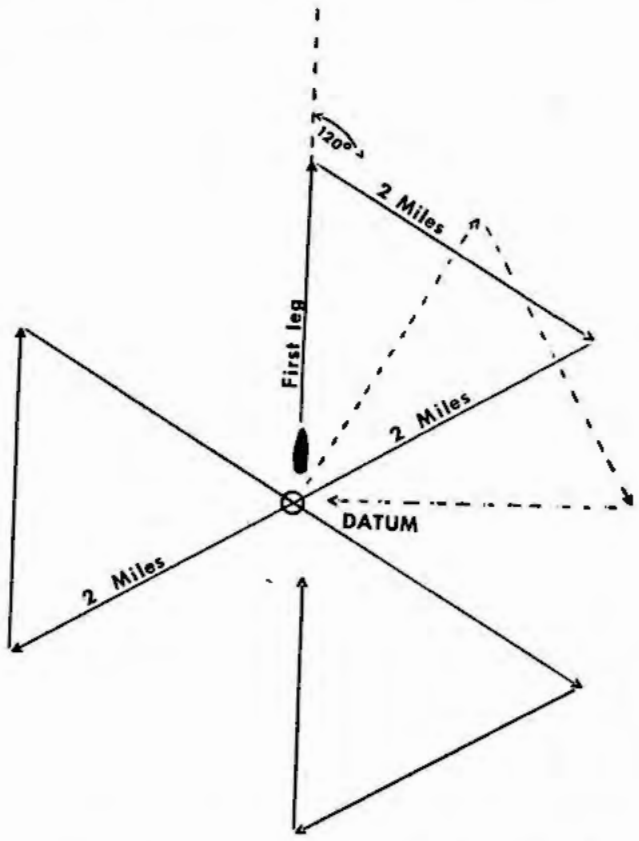
A search pattern in which a ship and an aircraft conduct a co-ordinated search. (See Pattern 6.)

* * * * *

PATTERN 1a

SECTOR SEARCH PATTERN—1 SHIP

For use when position of search target is known within close limits, with a small probable area. Examples: (a) Man overboard—Ship returns immediately to datum. (b) Search target is once sighted and then lost—ship heads for datum.

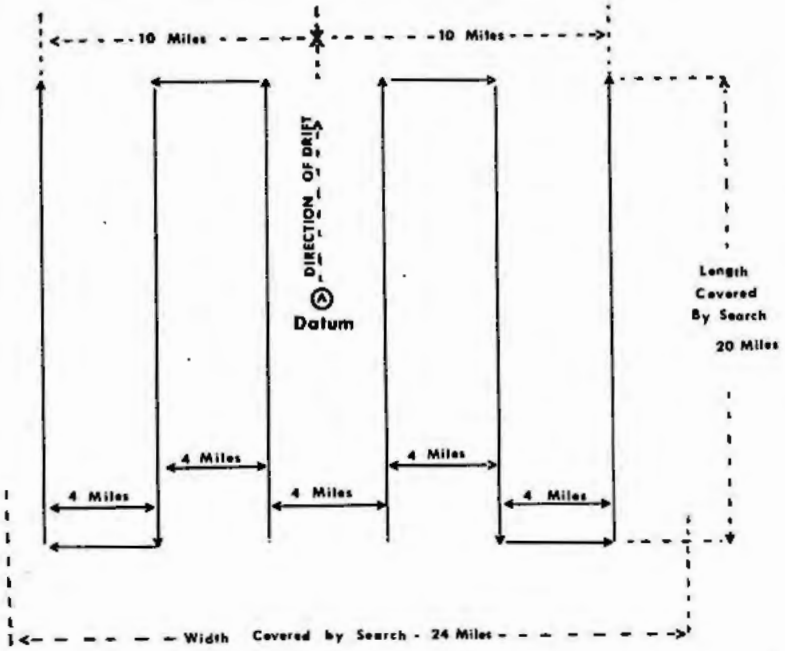


All turns are 120° to starboard. Start pattern at datum. This pattern gives a very high probability of detection close to datum and spreads the search over the probable area quickly.

Upon completion of first search, re-orient the pattern 30° to the right and research as shown by the dashed line.

PATTERN 2

PARALLEL TRACK SEARCH PATTERN—2 SHIPS



4.4.2 Unless land-based authorities supply a datum, it will be the responsibility of the CSS to do so and to communicate this information to assisting ships and appropriate Coast Radio Station.

4.4.3 It will be at the discretion of the CSS to communicate revised datum as necessary.

4.4.4 To assist in planning the search, the CSS will first need to plot the datum and the initial most probable area. The most probable area is the area centred on the datum, within which the search target is most likely to be, after allowance is made for probable errors in datum due to inaccuracy in the reported position of the casualty and/or the estimate of drift. For the initial stage it is suggested that this area be established by drawing a circle of radius 10 miles with centre at datum for the time of starting the search, and then squaring it off with tangents. The area may be enlarged when sufficient search units arrive.

* * * * *

4.4.5 There may be occasions, with small craft in particular when large errors may adversely affect the computation of the datum. It is nevertheless important to search a smaller area thoroughly rather than attempt to cover a larger one less effectively.

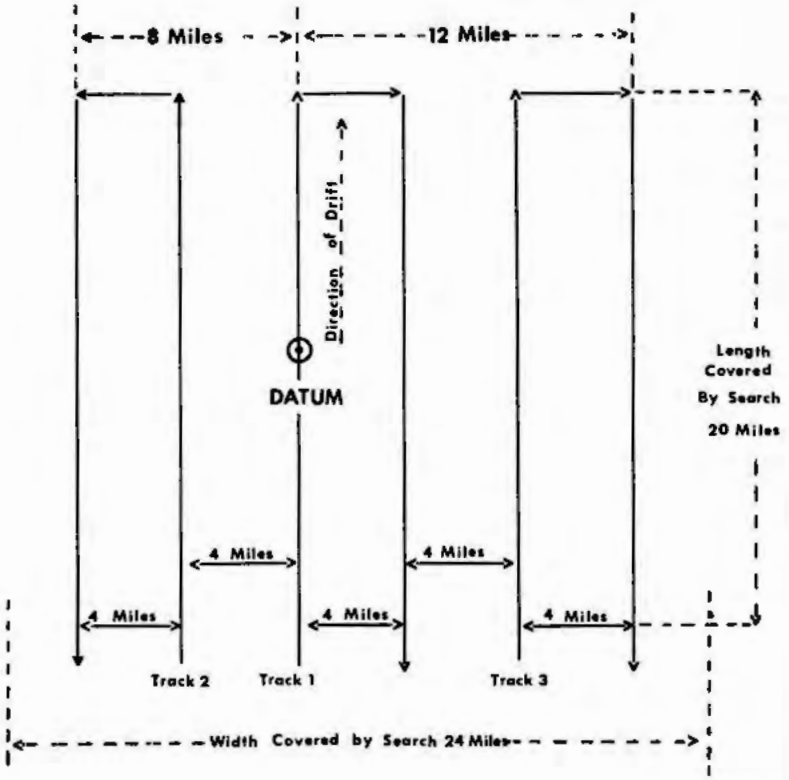
4.4.6 With parallel track search patterns, the CSS will need to decide the initial course to be steered by searching ships. This should normally be in the direction of drift. Where, however, the line of approach to the scene of assisting ships would enable a search to be initiated more rapidly, there would be advantages in making the initial course the reciprocal of the line of drift.

4.5 Visual Search

4.5.1 Individual search patterns have been designed with the aim of providing a readymade framework to enable a search by one or more ships to be initiated rapidly by the CSS.

PATTERN 3

PARALLEL TRACK SEARCH PATTERN—3 SHIPS



4.5.2 Inevitably, there will be a number of variables that cannot be foreseen. Search patterns based on visual search have been established which should, however, meet many circumstances. They have been selected for simplicity of execution.

4.6 Radar Search

4.6.1 When several assisting ships are available there may, at times, be advantages in carrying out a radar search, especially in circumstances when the position of the casualty is not known reliably and the prospects of SAR aircraft participating are remote. No prescribed pattern has been provided for this contingency. The CSS should normally direct ships to proceed in "loose line abreast" maintaining an interval between ships of the expected detection range multiplied by 1½ times.

* * * * *

4.8 Searching Speed

4.8.1 To carry out a parallel track search in a co-ordinated manner, all units should proceed at the same speed as directed by the CSS. This should normally be the maximum speed of the slowest ship present. In restricted visibility, the CSS will normally order a reduction in searching speed. (See paragraph 4.11.)

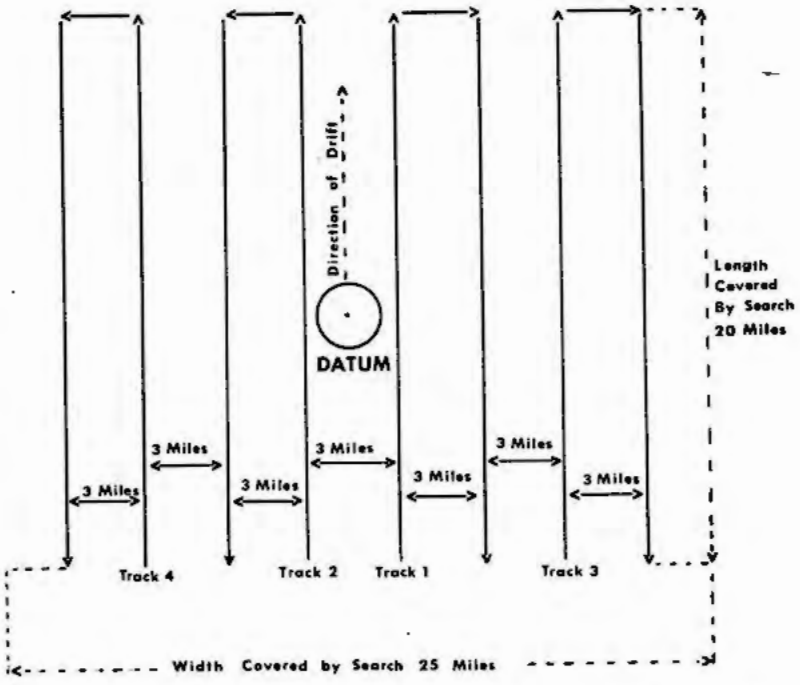
4.9 Search Pattern

4.9.2 In the event of the arrival of assisting aircraft during the execution of one of the above search patterns as illustrated in the article, it is usually desirable for the surface units to continue and to complete the existing search. The aircraft should search independently using the surface units as a navigational reference point if desired. At the completion of the current search, the CSS or OSC should decide the most effective method of employing units at his disposal.

4.9.3 These search patterns give, in general, good visual coverage of the area. However, in circumstances in which the searching speed is slow, the information on which the datum is based is incomplete or unreliable, or when high drift rates are encountered, they have inevitable limitations. To an extent, these can be compensated for by the arrival of additional search units, recomputing datum and the most probable area periodically, and expanding the search area more in one direction than in another.

PATTERN 4

PARALLEL TRACK SEARCH PATTERN—4 SHIPS



* * * * *

4.10 Initiation of Search

4.10.1 When one ship arrives on scene well in advance of the others, she should proceed directly to datum and commence an expanding square search.

4.10.2 If possible, datum may be marked by putting over, for example, a liferaft or other floating marker as a check on drift.

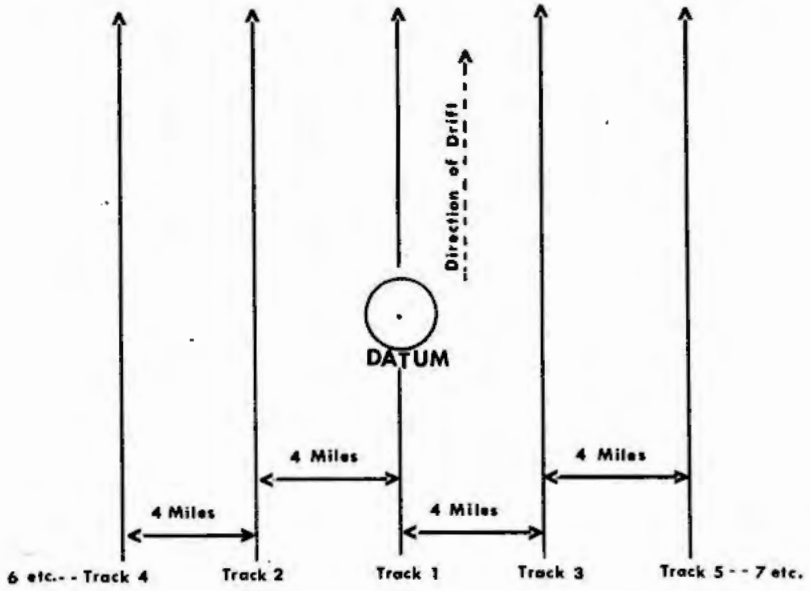
4.10.3 As other ships arrive, the CSS should select one of the search patterns 2, 3, 4, or 5 as appropriate and allocate track numbers to individual ships. In periods of good visibility and with sufficient search units on hand, the CSS may consider it advisable to let the first ship continue its expanding square search while the others conduct a parallel track search through the same area. In periods of restricted visibility, or

PROPOSED ADDITIONS TO THE INTERNATIONAL CODE OF SIGNALS

FR1	CARRY OUT SEARCH PATTERN ____ STARTING AT ____ HOURS. INITIAL COURSE ____ SEARCH SPEED ____ KNOTS.
FR2	CARRY OUT RADAR SEARCH, SHIPS PROCEEDING IN LOOSE LINE ABREAST AT INTERVALS BETWEEN SHIPS OF ____ MILES. INITIAL COURSE ____ SEARCH SPEED ____ KNOTS.
FR3	VESSEL INDICATED (call sign or identity) IS ALLOCATED TRACK NO. ____
FR4	VESSEL/S INDICATED ADJUST INTERVAL BETWEEN SHIPS TO ____ MILES.
FR5	ADJUST TRACK SPACING TO ____ MILES.
FR6	SEARCH SPEED WILL NOW BE ____ KNOTS.
FR7	ALTER COURSE AS NECESSARY TO NEXT LEG OF TRACK NOW (or at time indicated).

PATTERN 5

PARALLEL TRACK SEARCH PATTERN—5 OR MORE SHIPS



if sufficient search units are not available, it will probably be better to have the first ship break off the expanding square search and so be available for initiation of a track search.

4.11 Restricted Visibility

4.11.1 The carrying out of a parallel track search in restricted visibility poses problems on account of the following considerations:

(*a*) The desirability of reducing the interval between ships as far as possible consistent with safety;

(*b*) The resulting loss of coverage;

(*c*) The potential risk of collision.

4.11.2 During periods of restricted visibility, the CSS should direct a reduction of speed as necessary. In such circumstances any ship not fitted with radar, or whose radar has become defective, should consider dropping astern of other ships informing the CSS of her action. This ship should continue the search when she judges her position, relative to other searching ships, safe to do so.

4.11.3 If and when the situation improves sufficiently, she should endeavour to resume her proper station, again advising the CSS.

4.11.4 If there is a reduction in visibility and ships have already started to carry out a search pattern, the CSS may decide that the safest action would be to continue the pattern in force despite the resulting loss of coverage.

4.11.5 Should it be necessary for the CSS to consider initiating any of the search patterns during conditions of restricted visibility, he should bear the following factors in mind:

(*a*) Ships will be proceeding at reduced speed and searches will therefore take longer;

(*b*) To search thoroughly an area in such conditions must mean a reduction in track spacing;

(*c*) Reduction in track spacing would require either a reduction in interval or the carrying out of more sweeps.

Bearing all these factors in mind, the CSS may therefore decide to accept a reduction in the area searched and he should have regard to the direction and rate of estimated drift in deciding whether to accept a reduction in one or both of the length and width of the search area.

4.11.6 In all circumstances should there be a subsequent improvement in visibility, the CSS should initiate such action as will best make good the lost coverage which has taken place.

4.12 Further Action on Completion of Initial Phase

4.12.1 The CSS will normally consider the initial phase to have been completed when, in the absence of further information, searching ships have completed one search of the most probable area. If at that stage nothing has been located, it will be necessary for the CSS to consider the most effective method of continuing the search.

4.12.2 Failure to locate the search target may be due to one or more of the following causes:

(*a*) Errors in position owing to navigational inaccuracies and/or inaccuracy in the distress communications reporting the position. This is especially likely to apply if the position of datum was based on an estimate using incomplete information;

(*b*) An error in drift estimation;

(*c*) Failure to sight the target during the search although it was in the search area. This is most likely to occur if the target is a small craft, survival craft or survivors in the water;

(*d*) The casualty having sunk without trace. Other than the case of a small ship or craft in rough weather, experience suggests that there is always likely to be some trace, even if only debris and/or oil patches;

(*e*) Navigational inaccuracies of the searching ships. This is most likely to apply when navigational fixes cannot be obtained.

4.12.3 Three courses of action

are open to the CSS:

(*a*) Re-search the same area allowing for added drift during the elapsed time since calculating last datum;

(*b*) Expand the most probable area, after allowing for added drift and search the expanded area. Depending on circumstances and information available, it may be advisable to expand the area more in one direction than another.

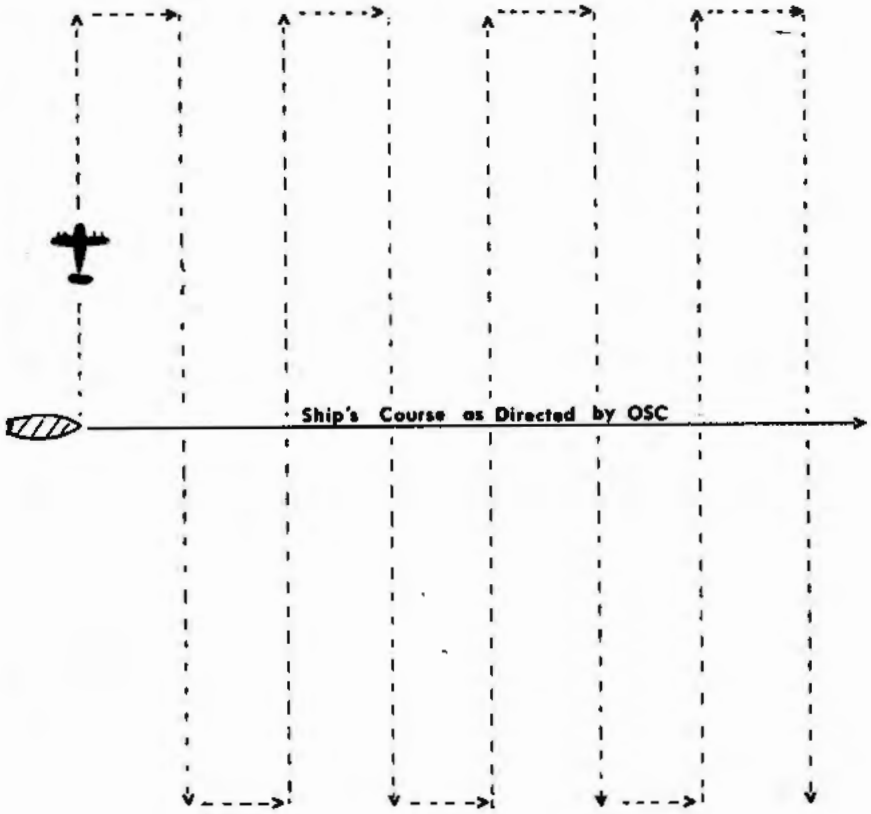
(*c*) Determine an entirely new probable area based upon additional information received.

Except in cases where a large ship is the target and small track spacing has been used, (*a*) or (*b*) above are indicated, depending on the number of search units that have arrived. Where information is received to indicate that the original datum was grossly inaccurate, (*c*) would be advisable.

4.12.4 A small target, which is easily missed in the daytime, may become visible at night if it shows lights, flares, or other pyrotechnics. The CSS should, therefore, consider using surface craft at night to re-search areas covered by day. It is good practice, when searching for survivors in small craft, in survival craft, or in the water, to stop occasionally the engines at night or in restricted visibility by day to listen for cries for help.

PATTERN 6

SHIP/AIRCRAFT CO-ORDINATED SEARCH PATTERN



4.13 Use of Ship/Aircraft Co-ordinated Pattern

4.13.1 The ship/aircraft co-ordinated pattern (see Pattern 6) would normally only be used if there is an OSC present to give direction to and provide communications with the participating ship. The objective of this type of search is for the aircraft to do most of the searching, while the ship steams along a course at a speed as directed by the OSC, so that the aircraft can use it as a navigational check point. The aircraft, as it passes over the ship, can easily make corrections to stay on the track of its search pattern. Such a co-ordinated search gives a higher probability of detection than can normally be attained by an aircraft searching alone. Ship speed varies according to the speed of the aircraft and the size of the pattern.

4.14 Evidence of Casualty Found

4.14.1 In some cases, the search may provide evidence of the casualty without survivors being found. This evidence may provide information for a recalculation of datum and revision of the search area.

4.14.2 When an abandoned ship is located it may have drifted before the wind faster than survival craft. In such a case concentration of search upwind is recommended. However, a low-lying, half-sunken loaded ship may drift more slowly than a floating survival craft, even if a drogue is used. A derelict may drift at a considerable angle off the prevailing wind direction.

4.14.3 When wreckage is located it usually consists of debris and/or an oil slick. Should this have come from the distressed ship, survival craft will usually be found downwind from the debris. In some cases, however, the ship may have been abandoned sometime before sinking, in which case survival craft may be upwind. Both possibilities should be considered. If it is known, or suspected, that survivors are in the water, the area into which they may have been forced by the buffeting of the seas should also be checked since

418-889—71——2

they may be affected more by this than by the wind.

4.15 Manoeuvring Instructions

4.15.1 The International Regulations for Preventing Collisions at Sea continue to apply fully while carrying out searches. The sound signals prescribed by Rule 28 will be of particular importance in the circumstances.

4.15.2 The master of any ship taking part in a search should endeavour to carry out all directions he may receive, but he must at all times have regard to the safety of his own ship and crew.

* * * * *

Availability of MERSAR Manual

The Coast Guard plans to issue a new publication (CG–421) later this year entitled Inter-Governmental Maritime Consultative Organization Search and Rescue Publications (IMCO SAR Publications) which will include the MERSAR Manual described here. Until the Coast Guard Manual is published, copies of the MERSAR Manual can be obtained at $1.20 per copy by ordering from: Publications Section, IMCO, 104 Picadilly, London WIZ OAE. ‡

AFFIDAVITS

The following affidavits were accepted during the period from December 15, 1970, to January 15, 1971:

Master Union Division of Continental Testing Laboratories,[1] 763 U.S. Highway 17–92, Fern Park, Fla. 32730, FITTINGS.

Sun Shipbuilding & Drydock,[2] Morton Ave., Chester, Pa. 19013, FLANGES.

[1] "Flex Seat" pipe Unions only.

[2] Steel spin flanges for Cu-Ni pipe only. Consideration shall be given to galvanic corrosion.

nautical queries

Q. What action by the crew of a lifeboat in distress would aid in their location by radar-equipped rescue vessels?

A. Hoisting aloft of a metallic object would materially assist in locating a lifeboat by radar, particularly if the boat is of wooden construction.

Q. Name the items carried in lifeboats for signaling or attracting attention.

A. (1) Radio
(2) Red parachute flares
(3) Red hand flares
(4) Signaling mirrors
(5) Floating orange smoke signals
(6) Flashlight
(7) Lantern
(8) Sails

Q. How would you use a signaling mirror?

A. To use a signaling mirror, the proper procedure is:

1. Face a point about halfway between sun and observed object which you desire to signal.

2. Hold mirror in one hand about 3 inches from the face and sight the object to be signaled through the sighting hole in the mirror.

3. The light from the sun shining through the hole in the mirror will form a spot of light on your face which will be reflected on the side of the mirror facing you. Now, while still sighting the object, adjust the angle of the mirror so that the spot of light reflected on the mirror disappears in the hole in the mirror. When this occurs, you will know that the reflected light from the sun is being directed toward the object.

Q. What action may be taken by the crew of a rescuing vessel to assist survivors in lifeboats or the water to get aboard?

A. A rescuing vessel should prepare cargo nets or save-all nets, lines, and boatswain's chairs to assist survivors in boarding the rescue vessel.

Q. When a vessel is searching for survivors in the daytime, what is the most effective way to indicate her presence, so the survivors can communicate or reveal their location with the means at their disposal?

A. When a vessel is on a rescue mission in the daytime and in the vicinity of possible survivors, she may indicate her presence by emitting heavy black smoke.

Q. Is a trained radio operator necessary in order to transmit distress signals with the lifeboat portable radio-telegraph transmitter-receiver? Explain.

A. No. The lifeboat portable radio-telegraph transmitter-receiver is equipped with an automatic keying system that enables persons to send a distress signal if they can secure the cabinet, rig the antenna and ground wires and then follow the simple instructions for operating the set.

Q. What equipment should be available in a boat sent to rescue survivors of a ditched plane?

A. 1. Several small lines (9-thread), each approximately 8 fathoms in length.
2. Spare boat hooks.
3. Spare kapok lifejackets.
4. Blankets.
5. Fire axes.
6. Pliers.
7. A bolt cutter.
8. Horsehide gloves.
9. Flashlights.

Q. What is the color of rockets, shells, or rocket parachute flares used as distress signals to indicate that the vessel firing them is in distress and requires assistance from other vessels or the shore?

A. Red

Q. What is the duty of a vessel's officers upon encountering any vessel or aircraft at sea displaying or transmitting any of the distress signals provided by the International Rules of the Road?

A. The master or person in charge of a vessel shall, so far as he can do so without serious danger to his own vessel, crew, or passengers, render assistance to every person who is found at sea in danger of being lost; and if he fails to do so, he shall, upon conviction, be liable to a penalty of not exceeding $1,000 or imprisonment for a term not exceeding 2 years, or both.

Q. When a vessel is in distress and has sent a radiotelegraph message requesting assistance, what measure should she take to insure that rescue craft can obtain her precise position and determine the shortest course to take in order to succor her?

A. It is requested that approximately 10 minutes after the transmission of the original distress message, the ship in distress transmit slowly on the distress frequency "MO" and its own call signal for 3 minutes. This will enable ships and radio direction finder stations in the vicinity to take radio bearings and to plot accurately the position of the distressed ship.

Q. What is the meaning of the orange smoke signal and combined light and sound signal (thunderlight) consisting of three single signals which are fired at intervals of approximately 1 minute when used by a lifesaving station in communicating with a ship in distress during daylight?

A. "You are seen. Assistance will be given as soon as possible."

Q. Your vessel has gone aground during the daytime and you are in distress. You observe an orange smoke signal from the shore and hear three single sound signals at intervals of approximately 1 minute. What do these signals indicate to you?

A. "You are seen. Assistance will be given as soon as possible."

Q. Your vessel is foundering and you are in distress, at night, and you observe the firing of a white star rocket, consisting of three single signals which are fired at intervals of approximately 1 minute on the shore. What does this signal indicate to you?

A. "You are seen. Assistance will be given as soon as possible".

Q. Give the signals to be used during daylight in the event your vessel is stranded and assistance is being rendered from the shore by a maritime rescue unit, to signify:

(a) Tail block is made fast.

(b) Man is in the breeches buoy.

(c) Slack away.

A. (a) Vertical motion of a white flag or the arms or firing of a green star signal.

(b) Vertical motion of a white flag or the arms or firing of a green star signal.

(c) Horizontal motion of a white flag or arms extended horizontally or firing of a red star signal.

Q. What does a signal consisting of a square flag with a ball above or below it indicate?

A. The signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball, is one of the recognized distress signals.

Q. If you received the call "Mayday" on the radiotelephone while at sea, what would it signify?

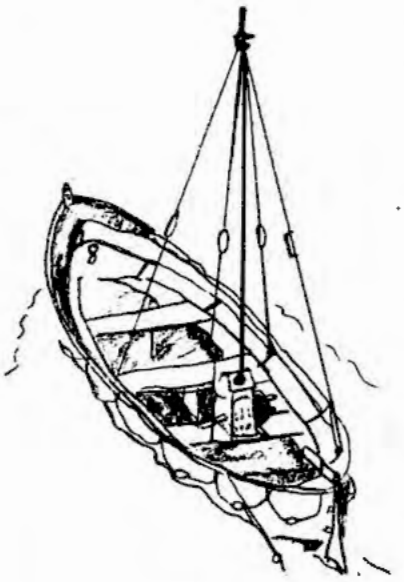
A. The call "Mayday" on the radiotelephone indicates that the vessel or aircraft transmitting this call is in distress and requires assistance.

Q. In a lifeboat, when should you use your orange smoke distress signals?

A. Orange smoke distress signals should be used only when aircraft or vessel is sighted.

PORTABLE RADIO

Q. Referring to the sketch below, describe how you would secure the lifeboat portable radiotelegraph transmitter-receiver, erect the vertical rod antenna, and rig the ground wire.



A. Fasten set firmly to thwart using the straps and hooks provided. Where straps and hooks cannot be used, lash cabinet to thwart using lowering rope and cabinet strap rings. Remove vertical rod sections and fit together. Straighten out wires, insulators, and rope. Plug rod into insulated socket and secure the rope ends of guys to sides of boat in a manner that will brace antenna. Unwind the ground wire and place the sinker end in the water. Refer to the specific instructions for your set in the transmitter receiver.

SS *UNION FAITH* (TAIWAN) WITH TOW COLLISION APRIL

COMMANDANT'S ACTION

1. The record of the Marine Board of Investigation [1] convened to investigate subject casualty has been reviewed, and the record, including the Findings of Fact, Conclusions, and Recommendations, is approved subject to the following comments and the final determination of the cause by the National Transportation Safety Board.

SYNOPSIS OF FINDINGS OF MARINE BOARD OF INVESTIGATION

1. On the evening of April 6, 1969, the SS *Union Faith* and the Barge *IOC No. 7,* one of the three loaded tank barges being pushed ahead by the tug *Warren J. Doucet,* assisted by the towboat *Cat & Mitch,* collided in the Mississippi River at New Orleans, La.

2. Fire and explosions ensued almost immediately after the collision on both the tank barge and the freighter. Twenty-five persons on board the SS *Union Faith* are missing and presumed dead. Three of the 26 Chinese survivors were injured by burns and smoke inhalation. There were no other known injuries or deaths. The freighter and the tank barge burned and sank in the channel after drifting downstream from the Greater New Orleans Bridge.

3. As the vessels were closing prior to the collision the downbound M/V *Warren J. Doucet* was directing her course at an angle across the river toward the left descending side in order to round Algiers Point. The upbound SS *Union Faith* which had already come around Algiers Point also altered her course toward the left descending side of the river prior to the collision.

4. When the M/V *Warren J. Doucet,* upstream from the Greater New Orleans Bridge, sighted the lights of the SS *Union Faith* at Algiers Point approximately 1½ miles away, she sounded a two-blast whistle signal which was not answered. She then sounded another two-blast signal while maintaining her course and speed but again received no answer. After watching the navigational lights of the upbound SS *Union Faith* and realizing that she was directing her course to starboard toward the left descending side of the river, the M/V *Warren J. Doucet* sounded four blasts on her whistle and placed her engines full astern. The SS *Union Faith* which had averaged approximately 9.5 miles per hour before slowing her engines shortly before the collision occurred, also sounded a four-blast danger signal and placed her engines full astern. The stem of the SS *Union Faith* cut into the starboard side of the lead Barge *IOC No. 7* at an angle of about 45 degrees approximately one-third the length of the barge abaft the head log.

REMARKS

1. Concurring with the Marine Board of Investigation, it is considered that the primary cause of the casualty was the failure of the SS *Union Faith* and the M/V *Warren J. Doucet* to reach an agreement as to the method of passing when in a meeting situation.

2. The heroic actions of the crews of the vessels involved in firefighting and search and rescue operations, as noted by the Marine Board of Investigation in Conclusion No. 8, are the subject of correspondence separate from the report of investigation.

3. This action is not concerned with and does not extend to the Administrative Penalty Procedures recommended by the Marine Board. Such administrative penalties are within the cognizance of the District Commander

[1] Due to space limitations the Coast Guard record of the Marine Board of Investigation is not printed herein.

AND TUG *WARREN J. DOUCET* IN MISSISSIPPI RIVER ON 6, 1969

with an appeal to the Commandant available only if a penalty is assessed.

4. Legislation concerning bridge-to-bridge radio communications, and the licensing of towboat operators is now pending in Congress.

W. J. SMITH,
Admiral, U.S. Coast Guard,
Commandant.

14 January 1970.

ACTION BY THE NATIONAL TRANSPORTATION SAFETY BOARD

This casualty was investigated by a U.S. Coast Guard Marine Board of Investigation convened at New Orleans, La., on April 10, 1969. A representative of the National Transportation Safety Board attended the proceedings as an observer. The National Transportation Safety Board has considered only those facts in the investigative record which are pertinent to the Board's statutory responsibility to determine the cause or probable cause of the casualty and to make recommendations.

SUMMARY OF FACTS

About 1915 on April 6, 1969, the upbound freight vessel *Union Faith* collided with barge *IOC No. 7* being pushed by the towing vessel *Warren J. Doucet,* downbound in the Mississippi River at New Orleans, La. *IOC No. 7* was the lead barge of a tandem tow of three tank barges, each loaded with approximately 9,000 barrels of crude oil. The total length of this tow was about 570 feet. The tug *Cat & Mitch* was made up to the port quarter of the face barge with her engines operating at about one-quarter speed. The *Warren J. Doucet* engines were operating at about one-half speed. The tow was proceeding about 3.8 knots, favoring the bends. This vessel was uninspected, and her pilot was not licensed.

The *Union Faith* was bound for a berth about 3 miles upstream from the Greater New Orleans Bridge, on the New Orleans side of the river. She proceeded from anchorage off Algiers Point, favored this point, and was making good about 10 knots as she cleared the point and headed upstream. Her anchors were on the brake, ready to let go. This Taiwanese freighter was being navigated by a licensed pilot.

Voice radio equipment on board the *Warren J. Doucet* and that used by the pilot of the *Union Faith* were not compatible as to operating frequency. The *Doucet* was equipped with voice radio operating on 2738 kHz at the time of the casualty, but not 156.65 MHz (channel 13). The pilot of the *Union Faith* used a portable transceiver operating on 156.65 MHz, but apparently was not monitoring 2738 kHz. Both vessels were equipped with marine radar. The radar was in operation on the towing vessel, but not monitored. It is not known whether the radar on the *Union Faith* was operating or being monitored. Navigation lights required by the Inland Rules of the Road and Pilot Rules were operating on the *Union Faith* and the *Warren J. Doucet* and her tow. The whistles of both vessels were operated prior to the casualty.

The casualty occurred after nightfall; however, the weather was clear and visibility was good, with a range of about 10 miles. The wind direction was northerly about 7 miles per hour. Traffic control lights for vessels in the vicinity of Algiers Point were not in operation, as the level of the river had not reached the limits requiring their operation (33 CFR 207.200(C)). The current was about 3 knots.

The collision occurred slightly upstream from the Greater New Orleans Bridge on the left descending side

of the river. *IOC No. 7* caught fire on contact and broke loose from the tow. A series of explosions followed almost immediately and the *Union Faith* was engulfed in flames. The barge broke into two sections which drifted down the river ablaze and later sank. Crude oil burned on the river and threatened the moored vessels and the harbor facilities. The *Union Faith* drifted downriver, burning from stem to stern, and sank about 0200 on April 7, 1969. Twenty-five persons aboard the *Union Faith,* including all personnel on the vessel's bridge at the time of the casualty, are missing and presumed dead.

Estimated monetary loss of vessels and cargo, and repairs to the bridge are in excess of $2,227,000. The total cost including lost time and repatriation of survivors is not determinable but considerably larger than the above figure. The sunken vessel created a hazard to navigation. The cost of removing the *Union Faith* from the river was about $1,647,000.

This collision narrowly missed resulting in a catastrophic fire along the New Orleans waterfront. The action of the master of the towing vessel *Cappy Bisso,* in hooking on the anchor chain of the burning *Union Faith,* prevented the ship from drifting downstream into the waterfront areas. Fortunately, the anchors dropped after the collision, slowing the drift of the freighter. New Orleans fireboats extinguished the two burning sections of tank barge *IOC No. 7* before the latter could spread the fire ashore. Other towing vessels and pilots moved 13 moored vessels along the downstream docks, as a precautionary measure. Thus, prior emergency planning, fortuitous circumstances, and timely coordinated action by many waterfront personnel averted a potential major fire.

ANALYSIS

The *Warren J. Doucet,* downbound for Algiers Locks, was favoring the right descending bank in Gouldsboro Bend until she reached a point approximately one-half mile above the Greater New Orleans Bridge. She then changed course to cross the river to the left descending side, with the intention to round Algiers Point in the bend. The course was being directed toward the bridge pier located on the New Orleans side of the river. Shortly before he changed course, the master made a radio transmission on 2738 kHz to contact any upbound traffic in the vicinity. When he received no answer, he announced that he was coming down the "two-whistle side" with three oil barges in tow. Shortly after he changed course, he sighted the lights of the *Union Faith* as that vessel rounded Algiers Point, about 1½ miles distant, bearing dead ahead.

When the vessels were approximately 1⅛ miles apart, and the *Union Faith* was bearing one point on his starboard bow, the master of the *Doucet* sounded a two-blast signal proposing a starboard-to-starboard passing but received no reply. The *Doucet* maintained her course and speed. When the vessel had closed to approximately one-half mile, personnel aboard the *Warren J. Doucet* noted, by the changing aspect of the *Union Faith*'s navigation lights, that the freighter was altering her course to her starboard and her bearing remained constant. The master of the *Doucet* sounded another two-blast signal and again received no reply. Following the second signal, the rate of change of the *Union Faith*'s course to her right increased. Realizing that collision was imminent, the master of the *Warren J. Doucet* turned his searchlight on the lead barge, sounded four blasts of the whistle, and placed his vessel's engines full astern. The *Union Faith* also sounded a danger signal and put her engines full astern. The speed of the *Union Faith* had been reduced to about 5.5 knots about 5 minutes before the order for dead slow (about 3 knots) which was in effect approximately 2 minutes before the danger signal was sounded.

The stem of the *Union Faith* penetrated the starboard side of *IOC No. 7* at an angle of about 45° at a point about one-third the length from the bow of the barge.

In analyzing all available causal factors, it is apparent that bridge personnel on the *Union Faith* did not detect the tow until the meeting situation was in extremis. This analysis is based mainly on the information given by personnel on the *Warren J. Doucet,* since all bridge personnel on watch on the *Union Faith* were lost. However, the ordering of dead slow 2 minutes prior to the collision indicates the pilot of the freighter was uncertain of the situation at that time, particularly because the vessel still had 3 miles to go before reaching its destination, and dead slow would have delayed arrival. It is likely that the collision would have been avoided had the pilot of the *Union Faith* ordered full astern in lieu of dead slow; however, he did not do so until collision was imminent.

After the *Union Faith* rounded Algiers Point, the bridge personnel should have seen the two white lights and sidelights on the *Doucet* which indicated a towing vessel pushing barges. The navigation lights on the *IOC No. 7* may have been difficult to see; however, bridge personnel using binoculars, under good conditions of visibility, should have been able to see the barge lights in sufficient time to take evasive measures. Background lights and reflections from the water may have made the barge lights difficult to detect. This raises the question of the state of attentiveness on the bridge of the *Union Faith,* but no information is available concerning this probable contributing factor.

A question of the indefiniteness of the regulations (46 CFR 113.55–30) governing navigation lights is raised by this case. The lead barge, *IOC No. 7,* carried battery-powered red, green, and amber navigation lights mounted on stands at the forward end, 4 feet above the deck. These lights were powered by two No. 6 1½-volt dry cell bat-

teries in series, supplying 3 volts to the 0.15 ampere bulbs, or 0.45 watts. Thus, the total electric power supplied to the lights on the lead barge of this 27,000-barrel tow of flammable crude oil was 1.35 watts. Section 80.16(g) of the Pilot Rules for Inland waters requires that these barge lights be visible at a distance of 2 nautical miles on a clear night. 46 CFR 113.55–30 prescribes 5.5 candlepower measured outside the lens to meet this visibility requirement. These regulations further recommend, by type number, various bulbs which meet this luminosity standard; however, they do not list recommended bulbs for 3-volt operations. A 75-watt bulb (at 115 volts) is recommended to produce the 2-mile visibility in a green fresnel lens. Thus, the ½-watt bulbs used on the *IOC No. 7* appear to be of very low power in comparison with others recommended. There is no practical method to measure the light intensity prescribed by these regulations, other than under laboratory conditions.

Inquiries by the Safety Board of the manufacturer of the navigation lights used on barge *IOC No. 7* indicate that it is next to impossible to provide performance data on lights using dry batteries because too many factors are involved. The manufacturer could not make any statement regarding "range of visibility." This situation is typical of the state of the art in such dry battery operated lights. At present, enforcement of the literal requirements of 46 CFR 113.55–30 would require laboratory testing of every type of light in use.

The tug was displaying proper navigation and towing lights powered by the vessel's 115-volt electrical system. The distance between the lights on the lead barge and those on the tug was approximately 580 feet, and there was no illumination on the barges anywhere between the lights on the towing vessel and the lights on the lead barge. Thus, the available target, to be detected in 580 feet to identify a barge, was a darkened object extending only 1 foot above the water, except for occasional vents and expansion trunks which might have extended as far as 3 feet above the water.

At the time the barge and towing vessels should have been visible to the *Union Faith,* after it rounded Algiers Point, the ½-watt navigation lights on the lead barge would have been almost directly in line with the 115-volt navigation lights of the *Warren J. Doucet* and the *Cat & Mitch.* Just before collision, the aspect the tow presented to the *Union Faith* would have been one towing vessel with two white lights, one above the other, and a green side light. There would also have been a second towing vessel, immediately adjacent to the first, showing a green side light, and then a third green light, accompanied by an amber light on the lead barge a considerable distance to the right of the easily recognizable towing vessel. The ½-watt green light and the amber light would have appeared to the *Union Faith* approximately 400 feet to the right of the lights of the *Warren J. Doucet* and the *Cat & Mitch,* assuming that the 580 feet actual distance was foreshortened by the 45° collision angle. In this 400-foot zone, the low barges would have been virtually invisible. (The danger signal was blown by the *Union Faith* only after the master of the *Warren J. Doucet* illuminated these barges with his searchlight.) This was the visual aspect which the pilot of the *Union Faith* was probably attempting to diagnose during the approximate 2-minute period in which the *Union Faith* was operating at dead slow. It may be assumed that he realized the nature of the object ahead and its position shortly before he put the engines of the *Union Faith* full astern. This would probably have been shortly after the *Doucet* illuminated the barges and the *Union Faith* sounded the danger signal.

During the period when the tow was turning to cross the river, the aspect of the lights on the tow would have changed, and if all the lights could be seen, and they were continuously observed, they could have been interpreted correctly as those of a tow turning across the river, even if it was impossible to see the low-lying barges. To have made this interpretation, however, may have required the use of binoculars to distinguish the lights on the towing vessels from the low-powered lights on the lead barge. It is not known whether binoculars were available or were employed. Binoculars are not required, but common sense dictates their use to take advantage of the increased visibility they provide. The visibility requirements for navigation lights do not assume the use of binoculars. The navigation lights on the towing vessel and barge *IOC No. 7* were observed by a stevedore onboard the SS *Maiden Creek* just prior to the collision.

It appears that both vessels were equipped with radar, but that it was not used to clarify the meeting situation. The master of the *Doucet* said it was used occasionally, but under conditions of clear visibility, it was not needed. Had he watched the track of the *Union Faith,* it should have been apparent earlier that this vessel was crossing toward the New Orleans side of the river. Proper evaluation of the information from radar can provide a better plan view of the other vessel's relative movement than can be judged visually.

The failure of the *Union Faith* personnel to hear the towing vessel's two-blast whistle signals may have been affected by the wind which was blowing against the *Doucet.* The Rules of the Road require mechanically propelled vessels to be equipped with "an efficient whistle or siren." The Motorboat Act requires a range of 1 mile for whistles on Classes 2 and 3 motorboats, but no performance standards are prescribed for larger vessels. Range of audibility is difficult to determine due to such variables as wind, atmospheric conditions, obstructions, wave condition, noise level on the receiving vessel, fre-

quency, and directional properties of the whistle. The need for specifying a minimum audible range for ships' whistles is obvious. A rating system, such as that developed by the International Association of Lighthouse Authorities, seems to be desirable.

Both vessels were following the local "points and bends" practice, by which the upbound vessel favors Algiers Point, and the downbound tow favors the bend, or New Orleans side, of the river. The *Union Faith* had previously passed three other downbound tows on her starboard side. The master of the *Doucet* overheard conversations concerning these passing agreements on 2738 kHz, and was cognizant of the upbound freighter prior to sighting her lights. Following this local practice results in vessels' and tows' crossing from one side of the river to the opposite side, and in starboard-to-starboard passings. Pilots normally broadcast their movement and proposed passing in the blind prior to rounding a bend in the river. The master of the *Doucet* did so on 2738 kHz, and the pilot of the *Union Faith* apparently broadcast his vessel's intentions on 156.65 MHz, having previously done so with the SS *President* and M/V *Mama Lear*. In this case, following the local custom led to the crossing situation and ultimate collision, since no radio or whistle agreement for passing was mutually reached by the two vessels.

This collision demonstrates the practical limitations of the visual and audible methods of communicating intentions of passing prescribed by the Inland Rules of the Road. The pilot of the *Warren J. Doucet* was unaware that the *Union Faith* apparently did not see the tow's lights, or hear his initial two-blast signal, until he observed the change of course of the freighter. Performance standards for navigation lights and whistles required by the rules are vague, or nonexistent. The pilot of one vessel has no way of knowing whether his whistle signal is heard on another vessel, unless a responding whistle signal is received. He has no specific way of knowing the range of audibility of his whistle. Similarly, he does not know how far his navigation lights can be seen. When he receives no response to his whistle signal, he does not know whether his proposal is heard, or is not acceptable to the other vessel. Uncertainty exists, and under the Inland Rules, he should sound the danger signal, but again he is not sure this signal will be heard. Prudent seamanship requires his slowing or stopping his vessel until agreement for passing is achieved. The decision on how far from the other vessel he should slow or stop when no whistle reply is heard requires accurate judgment by the person in charge of the vessel. Relative speed, wind, current, maneuvering characteristics of both vessels, restrictions of navigable waters, local customs, traffic pattern, and a number of other factors must be considered in his decision-making process. Article 27 of the Inland Rules of the Road appears to recognize that there will be maneuvering situations, system failures, and other types of hazards and circumstances where departure from the rules is necessary to avoid collision, stating:

> "In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necesssary to avoid immediate danger."

This rule recognizes that even strict compliance with the Inland Rules does not assure that collisions will not occur, and that rules are fallible. In this sense, Article 27 implies that the system for avoiding collisions is known to be incomplete. Although Article 27 appears to fix responsibility upon the person in charge of the navigation of the vessel to avoid "all dangers" and to compensate for all "special circumstances," such judgment is not always a practical possibility. In this accident, there was no objective basis in the circumstances of the accident or in Article 27, by which a time of necessity for a still slower speed or a stop on the part of either the *Union Faith* or the *Warren J. Doucet* could have been determined. Thus, although Article 27 is stated in broad terms, it did not function here as a workable backup to the failed communication systems.

The Inland Rules of the Road do not provide for any backup system for the required navigation lights, whistle signals, or maneuvering rules. Dual filament bulbs for navigation lights, and tell-tale indicators for these lights, are frequently installed on larger vessels but are not required by rules or regulations. As previously noted, binoculars serve as a backup for visual detection of other vessels, but are not required. Similarly, radar supplements the visual evaluation of a meeting situation, but radar is not required. In this case, the pilot of the *Warren J. Doucet* used the vessel's searchlight to illuminate his tow, a backup system to the navigation lights on his lead barge. Searchlights are not required by regulations. Bridge-to-bridge radiotelephone communications serve as the most effective backup system to both visual and audio methods of collision avoidance, but this method of communication of passing intentions is not required by law or regulation. In this case, lack of a common voice radio frequency precluded use of voice communications to avoid the collision. Particular emphasis on the lack of legal requirements for voice radio communications is made by the Board under Recommendations.

It is likely that the collision would have been avoided had the traffic control lights for this area been in operation. These lights are actuated when the river reaches 10 feet on a rising stage, on the Carrollton Gage. The stage of the river was approximately 9.3 feet at the time of the casualty.

The probable source of ignition of the highly volatile crude oil in the *IOC No. 7* was sparks produced by the

shearing of the deck and side of the barge by the bow of the *Union Faith*. Resulting explosions on the barge probably holed the bow of the *Union Faith*, which ultimately sank by the head. Rapid spread of the fire on board the *Union Faith* is attributed to these explosions which shot burning oil onto the vessel. The flames from the burning vessels damaged the 150-foot high Greater New Orleans Highway Bridge. The barge was impaled on the bow of the freighter, then broke in half, each portion passing down the ship's sides. Tarpaulins and wood hatch covers, and subsequently, the combustible general cargo in the holds, were ignited. Wood deck, doors, and paneling in the accommodation spaces burned. The intense flames and pungent smoke blocked the usual routes of escape from some of the quarters. Several persons escaped through portholes to the deck, and jumped overboard. The Safety Board has noted before the effectiveness of portholes as an alternative means of escape in the burning and foundering of the SS *Gulfstag* (report released May 29, 1968). The loss of life is attributed to the victims being trapped by the fire and smoke in their quarters, as well as in the engineroom and on the bridge. More would have been lost but for the prompt rescue efforts of the crew of the towing vessels *McGrath II* and *Cappy Bisso*.

PROBABLE CAUSE

The National Transportation Safety Board finds that the probable cause of this collision was the failure of the *Union Faith* to detect the *Warren J. Doucet* and the position of its tow until collision was imminent. Factors which resulted in this failure included: inability to communicate on a common radiotelephone frequency; probable insufficiency of the navigational lights on the Barge *IOC No. 7* to draw attention to its location; probable insufficiency of the whistle of the *Warren J. Doucet* to effect communication with the *Union Faith* at an adequate distance under the existing weather conditions of reception aboard *Union Faith;* apparent nonuse of available radar by either vessel to monitor the movements of the other vessel; and apparent lack of constant surveillance of the lights on the towing vessel by bridge personnel on the *Union Faith*.

A contributing factor was the failure of the *Warren J. Doucet* to sound immediately the danger signal and take avoiding action when the changing aspect of the *Union Faith's* navigation lights indicated that the vessel was altering course to her starboard. The apparent change in the heading of the *Union Faith* should have been considered of particular importance since the *Warren J. Doucet* had no passing agreement with the *Union Faith* and, in fact, had not even received a whistle signal reply. There is no indication that the danger signal would have been heard, but avoidance action would have reduced the probability of collision.

The major factor contributing to the loss of life was the rapidity with which the fire from the highly volatile crude oil engulfed the *Union Faith* and blocked the normal exits in the midship house.

RECOMMENDATIONS

The National Transportation Safety Board concurs in Recommendations Nos. 2 and 3 of the Marine Board concerning the need for bridge-to-bridge radiotelephone communication and the licensing of the operators of towing vessels.

Chairman John H. Reed of the National Transportation Safety Board appeared October 13, 1969, before the Subcommittee on Coast Guard, Coast and Geodetic Survey, and Navigation of the House of Representatives' Committee on Merchant Marine and Fisheries, in support of H.R. 13987—a bill to provide for the licensing of personnel on towing vessels. The Board previously recommended similar legislation in its report of the loss of the towing vessel M/V *Southern Cities* and in its special studies, "Collisions of Radar-Equipped Merchant Ships and Preventive Recommendations" and "Towing Vessel Safety and Accident Preventive Recommendations."

We support S. 1240, a bill to require a radiotelephone on certain vessels navigating upon specified waters of the United States, and plan to testify on the need for such legislation before the Senate Commerce Committee.

In addition, the Safety Board recommends that:

(1) The Congress enact the House-passed H.R. 6971, bridge-to-bridge radiotelephone bill, at the earliest date practicable. Our analysis of this collision, as well as others, indicates the potential for a catastrophic casualty involving vessels carrying hazardous materials; and the need for assurance of such communications' capability between vessels transporting these commodities.

(2) Pending enactment of such legislation, the American Pilots' Association urge their pilots to request the master of vessels which they are piloting to guard the local towing vessel frequency, and broadcast their vessels' operational intentions on this frequency, in addition to the broadcast by the local pilots on the local UHF frequency.

(3) The American Pilots' Association establish a policy whereby their member pilots will request masters of vessels which they are piloting to arrange for the monitoring of ship's radar, when available, to assist in collision avoidance, even under conditions of good visibility.

(4) The Coast Guard initiate enforcement action to insure that navigation lights used on barges meet the requirements of 46 CFR 113.55–30. Specifications for approval of battery-operated navigational lights should be developed and included in 46 CFR 161, and approved models and manufacturers included in Coast Guard Equipment Lists (CG 190). It appears that enforcement can best be accomplished by laboratory tests of the manufacturer's products at the manufacturer's facility.

(5) The Coast Guard determine by necessary laboratory tests whether the types of navigational lights used on the barge *IOC No. 7* met the requirements of 46 CFR 113.55–30.

(6) The Coast Guard, in its present study of the visual effectiveness of shipboard navigational lights relative to the lighted background conditions in harbors and other developed areas of the inland waterways, include the problem of attention-getting and definition of orientation of barge tows. It is the Board's view that changes in regulations resulting from this study should prevent any possibility of uncertainty as to what type of vessel is seen, and provide a comfortable margin of light output well beyond that which could be shown to provide theoretically the desired range of visibility.

(7) The Coast Guard should consider amending the law and regulations to specify minimum performance standards for whistles on all vessels provided with them in accordance with the applicable Rules of the Road, similar to the standards proposed by the International Association of Lighthouse Authorities.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

Adopted this 15th day of October 1970:

/s/ JOHN H. REED, *Chairman.*

/s/ OSCAR M. LAUREL, *Member.*

/s/ FRANCIS H. MCADAMS, *Member.*

/s/ LOUIS M. THAYER, *Member.*

/s/ ISABEL A. BURGESS, *Member.*

New Procedure for Processing Amendments to the Dangerous Cargo Regulations

A new procedure has been adopted for notifying the public of proposed amendments to the Coast Guard's Dangerous Cargo Regulations (46 CFR 146–149). In the past, notification has been made both by publishing a notice in the Federal Register and by providing details on the proposed changes in the U.S. Coast Guard Merchant Marine Council public hearing agenda (CG–249). This year, however, the public will receive both notice and details of the proposed amendments in the Federal Register. Separate public hearings will be planned for each set of proposed amendments.

The new procedure has been established in part to lessen the administrative problem of handling an increasing number of amendments to the packaging, handling, and stowage tables of 46 CFR 146. Most such amendments are derived from similar changes to the regulations of the Hazardous Materials Regulations Board of the Department of Transportation (49 CFR 170–189), which the Coast Guard is required by law to adopt.

Specifically, the following procedure will now be used in the development of the regulations of 46 CFR 146–149:

1. A special public hearing will be held on June 8, 1971 (following notification in the Federal Register) to cover most amendments derived from related changes to 49 CFR 170–189 that have been published over the past 2 years. This public hearing will also deal with proposed changes normally published in CG–249 which are not associated with the regulations of the Hazardous Materials Regulations Board.

2. Two other special public hearings will be held to cover amendments not included in the above-mentioned public hearing. These amendments will be derived from recent changes to 49 CFR 170–189. The first of these additional public hearings will be held on May 4, 1971, the second at a later date.

3. In the future, the Coast Guard will keep abreast of the regulation development in 49 CFR 170–189 by publishing notices of proposed rule making and public hearing in the Federal Register simultaneously with the notices published by the Hazardous Materials Regulations Board. Any amendments accepted following the public hearing will also be published simultaneously with those made by the Hazardous Materials Regulations Board.

4. Other changes to the Dangerous Cargo Regulations, those not necessarily related to 49 CFR 170–189, will be proposed in the Federal Register at appropriate intervals.

Circular

NVIC 0–71

The annual listing of navigation and vessel inspection circulars in force, and cancellation of others has been made in Navigation and Vessel Inspection Circular 0–71.

Copies of this circular may be obtained at the local marine inspection office or by writing Commandant (CAS–2) U.S. Coast Guard, Washington, D.C. 20591.

MERCHANT MARINE SAFETY PUBLICATIONS

The following publications of marine safety rules and regulations may be obtained from the nearest marine inspection office of the U.S. Coast Guard. Because changes to the rules and regulations are made from time to time, these publications, between revisions, must be kept current by the individual consulting the latest applicable Federal Register. (Official changes to all Federal rules and regulations are published in the Federal Register, printed daily except Sunday, Monday, and days following holidays.) The date of each Coast Guard publication in the table below is indicated in parentheses following its title. The dates of the Federal Registers affecting each publication are noted after the date of each edition.

The Federal Register will be furnished by mail to subscribers, free of postage, for $2.50 per month or $25 per year, payable in advance. The charge for individual copies is 20 cents for each issue, or 20 cents for each group of pages as actually bound. Remit check or money order, made payable to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated January 1, 1970 are now available from the Superintendent of Documents price: $3.75.

CG No.	TITLE OF PUBLICATION
101	Specimen Examination for Merchant Marine Deck Officers (7–1–63).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (5–1–68). F.R. 6–7–68, 2–12–69, 10–29–69.
115	Marine Engineering Regulations and Material Specifications (7–1–70). F.R. 12–30–70.
123	Rules and Regulations for Tank Vessels (5–1–69). F.R. 10–29–69, 2–25–70, 6–17–70, 10–31–70, 12–30–70.
129	Proceedings of the Merchant Marine Council (Monthly).
169	Rules of the Road—International—Inland (9–1–65). F.R. 12–8–65, 12–22–65, 2–5–66, 3–15–66, 7–30–66, 8–2–66, 9–7–66, 10–22–66, 5–11–67, 12–23–67, 6–4–68, 10–29–69, 11–29–69.
172	Rules of the Road—Great Lakes (9–1–66). F.R. 7–4–69, 8–4–70.
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids (3–2–64).
175	Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3–1–65).
176	Load Line Regulations (2–1–71).
182	Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
184	Rules of the Road—Western Rivers (9–1–66). F.R. 9–7–66, 5–11–67, 12–23–67, 6–4–68, 11–29–69.
190	Equipment Lists (8–1–70). F.R. 8–15–70, 9–29–70.
191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (5–1–68). F.R. 11–28–68, 4–30–70, 6–17–70, 12–30–70.
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5–1–67). F.R. 3–30–68, 4–30–70, 10–20–70.
220	Specimen Examination Questions for Licenses as Master, Mate, and Pilot of Central Western Rivers Vessels (4–1–57).
227	Laws Governing Marine Inspection (3–1–65).
239	Security of Vessels and Waterfront Facilities (5–1–68). F.R. 10–29–69, 5–15–70, 9–11–70.
249	Merchant Marine Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (5–1–69). F.R. 10–29–69, 2–25–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (8–1–69). F.R. 10–29–69, 2–25–70, 4–22–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70.
258	Rules and Regulations for Uninspected Vessels (5–1–70).
259	Electrical Engineering Regulations (3–1–67). F.R. 12–20–67, 12–27–67, 1–27–68, 4–12–68, 12–18–68, 12–28–68, 10–29–69, 2–25–70, 4–30–70, 12–30–70.
266	Rules and Regulations for Bulk Grain Cargoes (5–1–68). F.R. 12–4–69.
268	Rules and Regulations for Manning of Vessels (5–1–67). F.R. 4–12–68, 4–30–70, 12–30–70.
293	Miscellaneous Electrical Equipment List (9–3–68).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (11–1–68). F.R. 12–17–68, 10–29–69.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (7–1–69). F.R. 10–29–69, 2–25–70, 4–30–70, 10–31–70, 12–30–70.
329	Fire Fighting Manual for Tank Vessels (7–1–68).

CHANGES PUBLISHED DURING FEBRUARY 1971

The following have been modified by Federal Register:

(No Change)