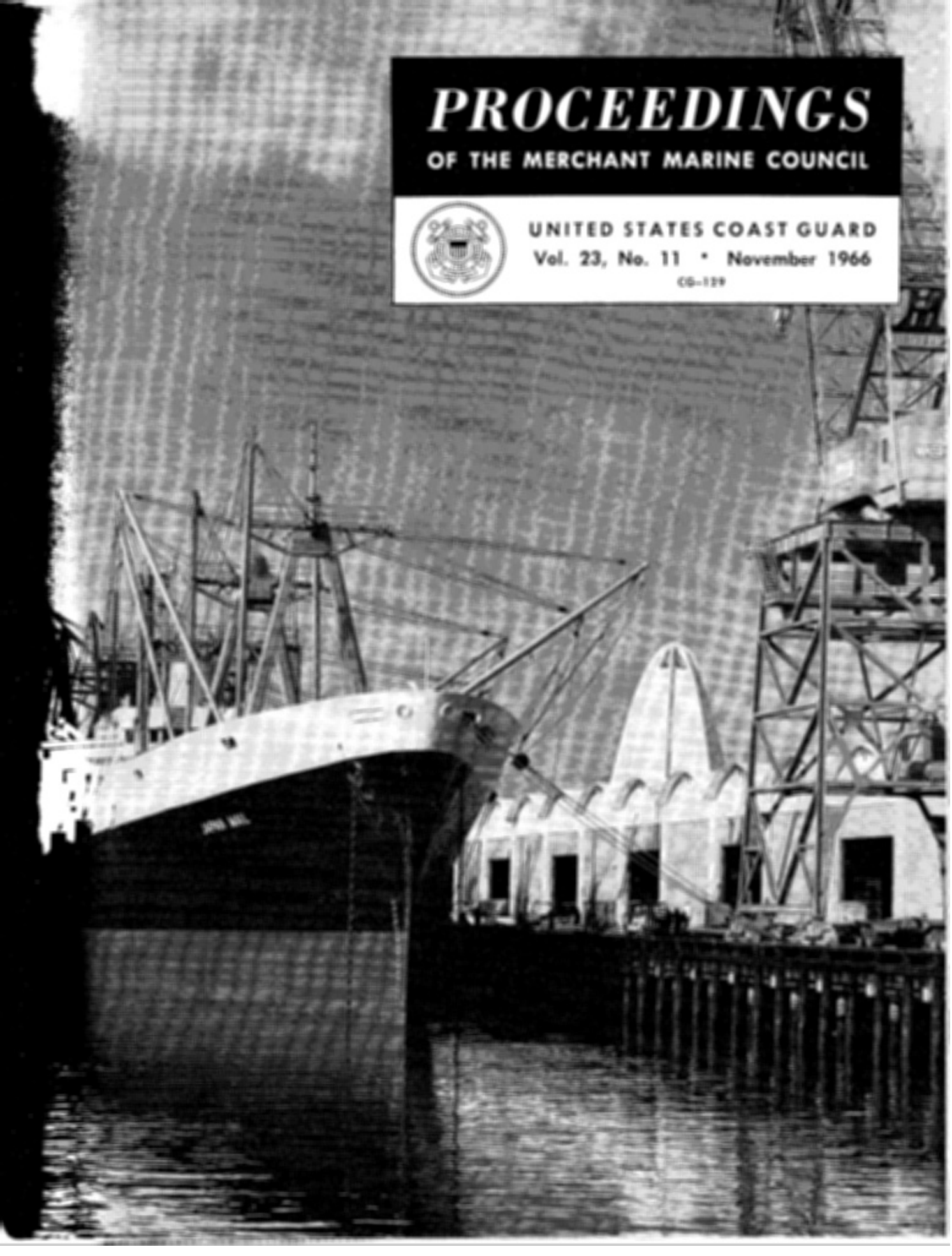


PROCEEDINGS

OF THE MERCHANT MARINE COUNCIL

UNITED STATES COAST GUARD

Vol. 23, No. 11 • November 1966

CG-129

IN THIS ISSUE . . .

SAN FRANCISCO BAY HOVERCRAFT . . .

SUPER SEA BUOYS . . .

FIRE PROTECTION PROGRESS . . .

OCEANOGRAPHIC VESSEL HEARING ANNOUNCEMENT . . .

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

CONTENTS

COVERS

FRONT: The American Mail Lines new cargoliner *Japan Mail* loads for the Far East.

BACK: *Japan Mail* unloading in Viet Nam. Photos courtesy Merry, Calvo, Love and Baker Inc., P.R., Seattle.

DIST. (SDL) NO. 83

A: a b c d e w(2) ; f g h i j k l m n o p q r s t u v(1)
B: n(35) ; c(16) ; e(5) ; f(4) ; g h(3) ; m d i j k m o p q(1)
C: a b c d e f g i m o u(1)
D: i(5) ; a b c d e f h k l m r u v w(1)
E: None
F: None
List 141M
List 111

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

PROCEEDINGS

OF THE

MERCHANT MARINE COUNCIL

Published monthly at Coast Guard Headquarters, Washington, D.C. 20226, 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 November 20, 1962.

Lt. Comdr. Alvin Jones Arnett, USCG, *Editor*
T. A. DeNardo, *Assistant Editor*

Hovercraft

Photos by Skelton, San Francisco.

Hovercraft smooths out rough waters of San Francisco Bay.

The Air Cushion Vehicle On San Francisco Bay

by
Lt. George F. Ireland, USCG

ON 10 AUGUST 1966 passenger service between Metropolitan Oakland International Airport and San Francisco International Airport was inaugurated using a unique mode of transportation. This was Westland Aircraft, Ltd.'s hovercraft, known also as the Air Cushion Vehicle (ACV) or Ground Effects Machine (GEM).

At the opening ceremony, the hovercraft looked like a creation from a Jules Verne novel as it flew up the ramp from San Francisco Bay within everyone's sight, throwing sea spray and whirring loudly. As it moved closer to the crowds it was not apparent to the casual observer how it was able to remain supported above the ground and move in response to the operator's commands. Two such hovercrafts, the English built SRN5 models, each with a passenger carrying capacity of 14 persons, were placed in service that day and began regular scheduled flights across San Francisco Bay; indeed a milestone in the history of American transportation.

The hovercraft is unlike any other vehicle presently used for public transportation and at the same time utilizes many of the properties possessed by the others. It has the feel of an airplane, offers the pleasure and sightseeing of a boat ride and since it is not confined to a water surface is able to render the door to door convenience of an automobile. This hovercraft is propelled by a General Electric LM–100 one thousand horse-

power gas turbine engine (similar to propulsion utilized on conventional helicopters) which drives through a gear box a large centrifugal lift fan and a variable pitch propeller. The lift fan pushes air into flexible skirts surrounding the craft, and generates a nozzle effect that enables the craft to "hover." By the application of thrust with a controllable pitch propeller forward motion is attained. In addition, twin stabilizers and rudders are mounted in the propeller air stream for steering and four hydraulically operated skirt jacks aid control by raising or lowering areas of the skirts. Over still water speeds in excess of 65 m.p.h. can be attained and the craft can fly over solid objects 3 feet in height with the flexible 4 feet high skirts. It can also climb a hill having a 9.5-degree slope. Needless to say this is a versatile vehicle.

Initial design of the hovercraft began in England and subsequently public transportation was first offered in that country. Now several different vehicles of this sort are in regular operation carrying passengers along routes as long as 15 miles.

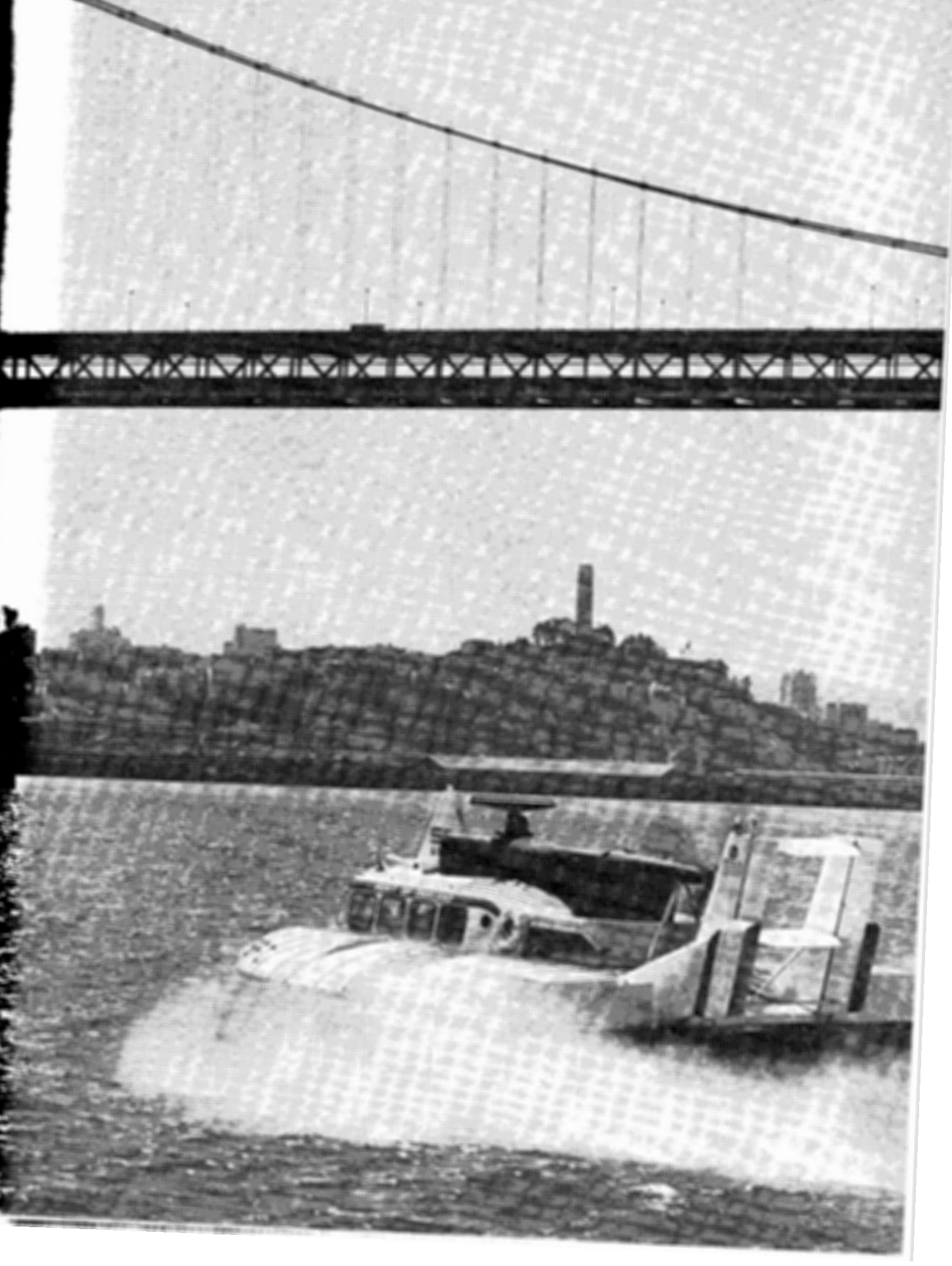
Additional British experience has taken advantage of the over water speed by adapting the SRN5 to military use in Malaysia at the island of Sebatik. In 1964 this craft began to transport ammunition, food and other strategic supplies along the Kalabakan River. Since utilization of the hovercraft virtually cut the time per trip in half, the troops soon became accustomed to regular mail deliveries and other pleasures which are not the usual custom in conditions of combat.

The SRN5 arrived in this country by a rather complicated process which involved much red tape, law searching, and the granting of a very important waiver. The Port of Oakland, a department of the municipal government of the city of Oakland, submitted in late 1964 an application to the Housing and Home Finance Agency in Washington for monetary assistance in a mass transportation demonstration project. The project was to be conducted in conjunction with Bell Aerospace Systems and San Francisco and Oakland Helicopter Airlines, Inc. (SFO). Two SRN5's would be utilized for a 1-year period of time.

U.S. Customs officials, however, could not approve the importing of the two foreign-built hovercrafts since they would carry American passengers for hire from one American port to another American port. This would be a violation of the Jones Act (Foreign Bottoms Law). However, there is provision for this law to be waived at the request of the Secretary of Defense to the extent necessary in the interest of national defense. Since the U.S. Navy at Norfolk, Va., was concurrently testing the SRN5 for military adaptability it was interested in operational results obtained from rigorous daily schedules at full load with cumulative hours of operation. The Secretary of the Navy subsequently recommended to the Assistant Secretary of Defense, Installations and Logistics that a waiver of the Foreign Bottoms Law be requested for the Secretary of the Treasury for the period of the Port of Oakland hovercraft demonstration in the interest of national defense. This was granted and the Housing and Home Finance Agency approved the request for a financial grant from the Port of Oakland. The total cost of the operation was to be approximately $1 million with the Housing and Home Finance Agency contributing two-thirds and the Port of Oakland, SFO and Bell Aerospace Systems contributing the remaining third.

Hovercraft operating over marshland.

Opposite. Operating against a background of the San Francisco Skyline.



At the request of SFO for authority to offer public scheduled service, the Civil Aeronautics Board in October 1964 called together representatives from the Federal Maritime Commission, Department of Commerce, Federal Aviation Agency, Interstate Commerce Commission, U.S. Coast Guard and the Bureau of Customs to determine just what interest each agency held and who would regulate or oversee this new operation. The collective tone of the statement resulting from this meeting was that these craft would be treated as ships or vessels since they would be interacting with surface vessels and not aircraft. Since SFO already had Civil Aeronautics Board approval to operate helicopter service over these routes and was not in competition with other carriers along these routes no further CAB approval was necessary. The U.S. Coast Guard then was to proceed with the responsibilities given it by title 46 U.S.C.

It was decided that a complete safety assessment of the craft was to be conducted by the U.S. Coast Guard Merchant Marine Technical Division at headquarters in Washington, D.C. However, the final approval and certification of the craft would be made by the Officer in Charge of Marine Inspection at San Francisco, Calif., within whose geographical zone the craft would be operating. The U.S. Coast Guard personnel in Washington worked closely with the English manufacturer to obtain information necessary for the complete and satisfactory safety assessment. Design alterations were not anticipated. However, it was felt that a complete design review was necessary so that a passenger could be assured of as safe a ride on this vehicle as any other. The Officer in Charge of Marine Inspection at San Francisco meanwhile proceeded with initial certification applying the rules and regulations for small passenger vessels insofar as they were applicable. As soon as the hovercrafts arrived in Oakland, Calif., and were assembled, SFO commenced operator training and vehicle orientation. This consisted of underway operation each morning and ground school each afternoon under the guidance of a qualified Bell Aerospace Systems engineer. One full-time and one part-time Coast Guard marine inspetcor were assigned to this training. Six persons were selected by SFO to receive the training, each being a qualified helicopter pilot. It is interesting to note that the craft's controls were patterned after helicopter controls and the transition from helicopter operation to hovercraft operation was not difficult for these skilled personnel. Upon completion of 20 hours of operating experience, route training, ground school, and successful completion of an operator's examination, a letter of authorization was issued to each operator by the Officer in Charge of Marine Inspection at San Francisco. Examination subjects included specific questions of hovercraft operations, Rules of the Road, Navigation, Seamanship, Communications, Firefighting, Lifesaving, and First Aid. Since their aircraft orientation had not included Rules of the Road this was one of the most difficult periods of their training. The services of the U.S. Coast Guard Auxiliary were utilized during ground school for this training and were extremely beneficial. After additional operating experience was gained U.S. Coast Guard operator's licenses endorsed for operation of the SRN5 hovercraft on San Francisco Bay and Tributaries, were issued.

Passengers embarking at Oakland International Airport.

During this training period, and while design and construction review was being conducted at U.S. Coast Guard Headquarters, an SRN5, identical to the craft being tested in Oakland, overturned in Norwegian waters with 14 persons on board. No one was injured, however this was of such a serious nature that the Air Registration Board in England curtailed all passenger-carrying operations until sufficient data could be gathered to pinpoint the cause and prevent a similar occurrence. To make matters worse, on May 11, 1965, one of the two SRN5's delivered to this country overturned during testing on San Francisco Bay with four persons aboard, one of them the resident Coast Guard inspector. Hovercraft operations in this country and in England were

further curtailed until extensive operational and model testing could be completed by the manufacturer to determine the cause for these two overturnings. An investigation was conducted of the San Francisco Bay overturning incident by the Officer in Charge of Marine Inspection at San Francisco and the results were forwarded to the manufacturer.

The Manufacturer's data and the U.S. Coast Guard investigation revealed a phenomenon termed "plough-in" which, briefly, is the resulting effect of the flexible rubber skirt adhering to the water surface. Due to the increased drag force an upsetting moment could be generated under certain stability conditions, specifically when the craft was in a high speed turn on smooth water. This adhesion force is similar to the drag felt when pulling a wet chamois across a flat surface. Design changes were then made providing for air lubrication and attachment of rubber strakes to increase the performance of the skirt assemblies. Again full scale and model testing were conducted and reasonable operating limitations derived from this testing firmly established safe operating conditions. The most significant of these operating limitations consisted of a relationship of speed and maximum allowable yaw angle.

When service was ready to be initiated across San Francisco Bay, hovercrafts had been in operation in England for a considerable length of time. The U.S. Coast Guard was, of course, interested in the operating requirements and restrictions placed upon the SRN5 set forth by the regulating agency in England. It is interesting to note that since the hovercraft becomes a nondisplacement vehicle and "flys," in England it is classed as an aircraft and subsequently becomes subject to the rules and regulations set forth by the Ministry of Aviation. Officials in this country, on the other hand, as previously stated, classed the hovercraft as a surface vessel considering that it would primarily be interacting with surface vessels. It should also be noted here that the routes this certification process contemplated were for all practical purposes entirely over water, the remainder being regulated airport runways.

It is not the purpose of this article to justify the limitations placed on the hovercraft operations, but to present a few unique problems which would be of general interest to the reader. The craft's heading may not necessarily be its direction of travel.

The Hovercraft is certificated for speeds up to 50 MPH. Note turbulent water surface, but very little wake.

That is, it may easily travel at maximum speed with a considerable constant angle of yaw and with some wind conditions it has shown a tendency to weathercock. This has always been apparent to aircraft pilots, however, this is a problem not appreciably experienced by operators of surface vessels. Presently the only way to determine yaw angle or to compensate for it is by plotting the track line of the vessel and comparing that to the intended course. For short routes as on San Francisco Bay a constant track is not plotted and it is important that the operator have sufficient visibility to see the relationship of his craft to the water surface. The yaw angle is especially important since the operating conditions established following the two overturning incidents set forth maximum allowable angles of yaw for various speeds. Yaw angle also prohibits the proper display of navigation lights. To overcome this the designer, in addition to the required lights, added a rotating amber beacon which shows 60 flashes per minute, not to be confused with the amber beacon which shows 90 flashes per minute displayed by a U.S. submarine when surfaced. On August 4, 1965, a Local Notice to Mariners was issued to acquaint operators and boatowners with the hovercraft operation, its speed capability and its special navigation lighting.

A gas turbine engine, as everyone knows, creates a high noise level and the hovercraft is no exception. This has placed a burden on the operator since it is virtually impossible for him to hear sound signals from other vessels when he may well be standing into danger. This was so well noted by the Ministry of Aviation that the English operators were relieved of the responsibility of initiating or responding to sound signals. The craft's speed capability, since it is many times that of a conventional harbor vessel, placed even more responsibility on the operator. The Ministry of Aviation and the U.S. Coast Guard each stated on their respective certificates that when acting as a nondisplacement vessel the hovercraft is to stay well clear of displacement vessels and avoid hindering their navigation. These regulations may well contribute to the beginning of a network of regulated sea roads throughout our nation's ports. Action is presently being taken in this direction to offer safe navigation for vessels when entering our major ports.

Public reaction has been generally favorable toward this new method of transportation. Most persons use the ACVs in conjunction with transportation to or from commercial airports, however a great many persons also purchased tickets just to "try out" this new vehicle. Plans are already in progress to increase this service. Because of its versatility, it is only reasonable to believe this form of transport can be used in other areas. ⚓

Scientific and Tactical Buoys

CDR Richard Thomas, USCG

On the evening of 24 April 1966 the Grace Line's SS *Santa Mercedes* was steaming south at a position about 160 miles S. E. by S. off Cape Hatteras. At 33°06′ N. latitude, 70°04′ W. longitude, a buoy was sighted; it appeared to be red or international orange in color, had a steady white light mounted on it, and was emitting orange dye. The appearance of orange dye raised a question in the mind of the master, for no buoy used on the high seas should have such a characteristic. A boat was lowered to investigate and the occurrence was reported to the Coast Guard Search and Rescue Center at Portsmouth, Va. The sea proved too choppy for those in the boat to obtain a good look at the buoy. Coast Guard Portsmouth replied that the ship's report was being forwarded to the U.S. Naval Oceanographic Office for evaluation.

Dozens of telephone calls to various agencies utilizing deep-sea buoys, one trip to the Naval Oceanographic Office, and the collection of many pages of literature on the subject have cast no light on what that evaluation should be. The orange dye reminds mariners of the orange smoke distress signal prescribed in the International Regulations for Preventing Collisions at Sea, and confuses any attempt to identify the buoy. This merely points out that masters and mates might find some information about buoys used at sea useful in the future. This article will try to answer some general questions about them covering what, where, when, and why.

Buoys at sea may be either free-floating or moored. Their sizes vary from less than a foot in diameter for the former up to 40 feet in diameter for the latter. The Intergovernmental Maritime Consultative Organization has published a standard recommendation for marking all oceano-

graphic research buoys, which has been accepted by the Intergovernmental Oceanographic Commission.

This recommendation is as follows:

Lighting—

(i) Colour: white-bluish, high-intensity, corresponding to the light of xenon discharge tube;

(ii) Repetition rate: short period of quick flashes of a few seconds' duration (2–5 seconds) followed by a longer period of darkness (15–18 seconds), the whole cycle being no less than 20 seconds.

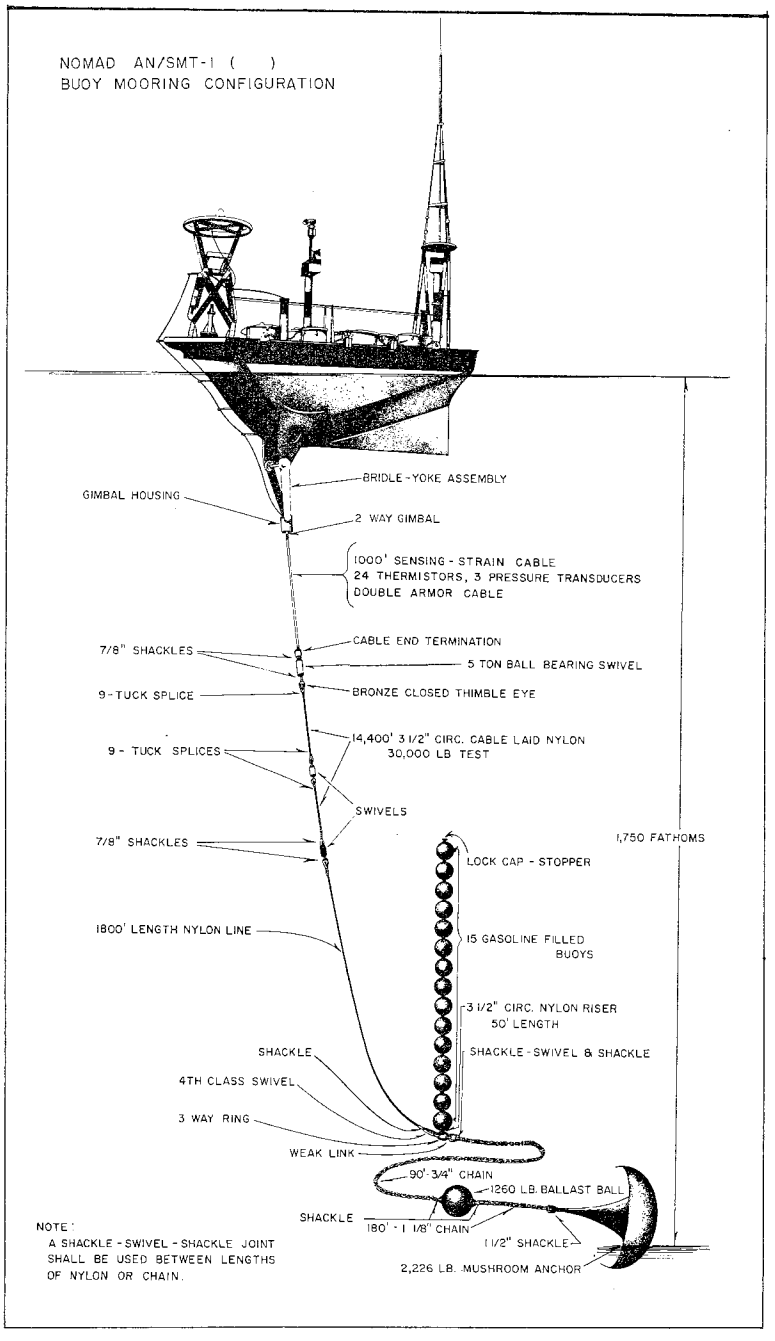
Painting—

Fluorescent yellow and red in wide stripes, vertical for anchored stations and horizontal for free-floating ones.

The majority of buoys will probably adhere to the above standards for identification in the future. Before the standards were published, buoys were often painted international orange and carried either a fixed or a flashing light, the latter commonly having a 1-second period. Although the U.S. Government agencies utilizing oceanographic buoys are making every effort to follow the international standard, it is still possible to encounter buoys with these older markings and light characteristics.

Free-floating buoys may be encountered anywhere at sea. They are small enough to preclude substantial damage to ships when struck. Their purpose may be scientific or tactical; the former are commonly employed for current studies and data recording, while the latter may be remote sonar stations. These sono buoys are painted international orange, have a 1-second flashing white light, and contain a flotation chamber with a water-soluble element so that they sink after their battery life has ended. It was this type of buoy that made the news several years ago with a Russian boast that one had been picked up (or "captured") in the waters off the British Isles.

Moored buoys of varying sizes may be found at several different locations off our coastlines. They may also be found in the waters throughout the rest of the world, as established by governments interested in oceanographic and meteorological research. In the Atlantic Ocean probably the largest complex of moored buoys may be found in "Navy Acre," the coordinates of which are 33° N., 71° W.; 33° N., 72° W.; 34° N., 72° W.; 34° N., 71° W. Within this part of the Atlantic, which lies roughly between Wilmington, N.C., and Bermuda, may be found various buoys which have been established by the Bureau of Weapons, the Naval Oceanographic Office and various firms with which the Government has contracted for research and development under a project called Anti-Submarine Warfare Environmental Prediction System (ASWEPS). These buoys may range in size from the NOMAD, or Navy Oceanographic and Meteorological Automatic Device to small vertical ocean buoys. The NOMAD, which is pictured, is 20 feet long, has a 10-foot beam, a *free board*



(*Continued on page 230*)

Progress in marine firefighting

C. A. Culver

C. A. Culver of Atlantic Richfield appeared before the American Petroleum Institute Tanker Conference this year to sketch the progress made in marine firefighting. The address of this heavily credentialed tanker safety engineer is adapted below.

WHEN YOU TRY to measure "progress", you must have a starting point and finishing point—that is, you have to compare where you stand now with where you stood at some point in the past. My starting point will be the Tank Vessel Regulations dated November 10, 1936.

Prior to 1936, it is my understanding that there were no specific regulations applicable to tank vessels and the steamship rules applied. It is further my understanding that these 1936 regulations were written by an industry committee with the cooperation of the old Bureau of Marine Inspection.

In the 30 years that we have had the Tank Vessel Regulations, there have been many changes that came under the category of progress. I have picked four changes and I list them in order of importance that, I think, show the greatest progress in fire protection. They are as follows:

1. Introduction of the all-purpose nozzle and the present requirement that all stations be equipped with this type nozzle (vessels constructed since 1962).
2. Elimination of steam smothering (vessels constructed since 1962) for cargo tank protection.
3. Introduction of the deck foam system concept.
4. Elimination of carbon tetrachloride as a fire-extinguishing medium.

Now let's look at each of these briefly.

ALL PURPOSE NOZZLES

All purpose nozzles were not in general use on tank vessels until several years after World War II. Personal experience with these nozzles in the Navy during the war made me think at the time they were the greatest thing since the invention of the wheel. There just is no comparison whatsoever between this nozzle and the straight bore or "suicide" nozzle. This was one of the basic points in the film "Fire Fighting Aboard Tankers" which had its premiere before this group in June 1961.

Many of the oil and shipping companies have equipped their ships with 100 percent fog nozzles even though the regulations do not require it for older ships.

STEAM SMOTHERING

Steam smothering found its way into the Tank Vessel Regulations from the Dry Cargo Regulations where it was the only method available. It was considered a smothering system, not an extinguishing system, to keep fires in Class A material from spreading. In the case of a petroleum fire, the fire can actually be extinguished by steam but it is necessary to apply steam in the compartments in sufficient quantity. Extensive tests go back as far as 1926 when Standard Oil of California found that to make a combustible mixture safe, it would have to be steamed to a temperature of 170° F., at which point it was impossible to ignite petroleum vapor. The 170° temperature by steam corresponds to a saturation of about 40 percent steam by volume.

In the summer of 1959, tests were conducted aboard the SS *Nevada* in the Delaware Valley area. The results of this test are a matter of record and the conclusion was that from a temperature of 90° F. in a center tank it took 1 hour and 10 minutes to reach 170° in all areas of the tank.

DECK FOAM SYSTEM

Foam systems have been in use on tank vessels for 40 years and when steam smothering was eliminated for new construction the deck foam system quickly took its place.

As far as I can determine, Atlantic pioneered the field with foam systems on tankers resulting from the conclusion that a fixed firefighting system, as such, had limitations. Our first use of this firefighting medium was about 38 years ago when we placed on our small motor ships portable chemical foam mixers and attendant apparatus consisting of a hopper with connecting hose and nozzle for use at any fire station. This was supplemented with a 30-foot aluminum pole to be used on cargo tank fires when intense heat would prohibit personnel from getting close to the fire.

Many improvements have been made to foam systems since, and, I believe the SS *Fort Fetterman* of Keystone Shipping Co. was the first ship to be equipped with the deck foam system as we know it today.

This system utilizes large turret foam nozzles placed at strategic points on the aft and midship houses along with hose connections for portable foam nozzles. These nozzles are able to cover the entire deck area and to deliver long-range, high-volume foam streams to any point in the area.

Many improvements have been made to these systems with the 3 percent solution over the 6 percent solution and the nozzles have also been improved along with the proportioners.

CARBON TETRACHLORIDE

A great amount of progress has been made on portable fire extinguishers in the past 20 years, mainly with the development and improvement of the dry powder extinguishers.

The elimination of the carbon tet extinguishers came out with the December 1, 1959, Tank Vessel Regulations which made carbon tet removal from the ships mandatory by January 1, 1962. This, in my opinion, was real progress. It was a known fact for years that phosgene gas was formed when carbon tetrachloride was sprayed on a fire. It was also known that it could cause serious illness by being absorbed through the skin and would affect the liver and kidneys, especially if one was known to imbibe on occasion.

Of course, the ultimate in portable fire protection is one all-purpose extinguisher that will handle all classes of fires. As far as I know we do not have an approved one as yet, but there are several that are very close to filling the bill and I hope that the USCG will come up with the answer.

Progress in Marine Fire Protection would not be complete without the major factor being mentioned: training of personnel.

We can build the safest ships afloat and equip them with the latest in fire protection but if the AB or oiler doesn't know what to do in an emergency, we have not completed the job.

The cooperation of the U.S. Navy permitting both officers and unlicensed men to attend their firefighting schools has contributed greatly to the overall program. Some of the oil companies have set up fire-training programs for their men at their various refineries, and many of them have on-board training programs administered by their marine safety people or by outside consulting firms.

In an emergency you need a leader and well-trained men to follow his orders.

WHAT'S NEW IN FIRE PROTECTION TO COME

There are several new products in the experimental stage ashore that have potential for shipboard use. They are still in the test stage and I will mention them briefly as their shipboard application is still in the thinking and planning stage.

1. FX 183 compound is a perflurocarbon surfectant which forms a tough skin or film on the surface of the liquid when it drains from the foam. This skin or film prevents the vapor from escaping from the petroleum product and therefore combustion cannot continue due to lack of fuel vapor.

2. Foam 100 is a new type foam that has been approved by the USCG for use on water soluble organic solvents and hydrocarbons.

This same manufacturer has another new liquid called XL–3 which has been tested at shoreside installations. This is a method of application whereby the foam liquid is introduced at the bottom of the tank and floats to the surface to extinguish the fire.

Socony-Mobil Oil Co., at Paulsboro, N.J., has conducted quite an experimental program in this area.

It would appear to me that this subsurface injection has a potential aboard ship but it is still in the experimental stage.

From the foregoing you can see that our progress in marine fire protection has been a steady and tedious undertaking but we have accomplished much in the way of safety for all those aboard ship. The future looks promising and we intend to continue our endeavors for better and safer conditions at all times. ⚓

SYNTHETIC LINES

More than 2 years ago MOA issued a safety letter entitled "Mooring Lions," because of the capability of a mooring line to maim or destroy a man as ruthlessly as a liion. It touched upon the hazards of synthetic lines. Since then, the use of synthetics has increased greatly and experience with them has broadened correspondingly. Many new varieties have been introduced, each intended to eliminate objectionable features of previous lines.

In spite of certain drawbacks, synthetics are popular with seamen because they are lighter and easier to handle than manila and are stronger. They can be stowed below when wet, without rotting; in fact, they should not be stowed for extended periods in sunlight. Synthetics are popular with shipowners because they last longer, are stronger, and reduce rope costs. It is important that only experienced seamen handle synthetic lines at winches and mooring bitts. Ship's officers must make sure their men know the types and characteristics of all lines used. Every manufacturer furnishes full instructions with his product and there is no valid reason for ignorance of its potential limitations.

For example, nylon lines are noted for extreme elasticity and stretchability. For these reasons, they are especially well suited for deep-sea towing but, although the strongest lines in proportion to size, they are not satisfactory mooring lines, particularly for large ships. Nor is nylon recommended for stoppers because when it breaks it is very apt to snap back and fracture a man's ankle.

Polypropylene or "polyprop" lines have a great strength, long life, are light to handle, do not absorb water and weigh the same wet or dry. They have built-in resistance to oil and chemicals and are good for topping lifts, boat falls, and other special purposes. They are not suitable for most guys and gantlines because of chafing. Polyprop lines have high gripping power and tend to freeze on bitts and winch heads unless watched carefully and eased off. In a case not long ago, a polyprop line under heavy strain suddenly surged after grabbing on the bits and threw the bos'n into the bitts. He lost his arm as a result.

Do not coil polyprop lines habitually in the same direction as it will unbalance the lay. If a polyprop line is used continually on the same side of the winch or windlass, in a counterclockwise direction, it will extend the lay and shorten the twist of each strand. Kinks and hocks will develop. If in a clockwise direction, the lay is shortened, the rope becomes stiff and will kink. Alternate directions regularly, starting with clockwise turns on new lines.

Dacron lines better resist abrasion by rough surfaces than the others because they resist heat and friction. They are well suited for small craft such as tugs, barges, and yachts. Polyethylene lines have about the same elasticity as Dacron and wear well. Many combinations of these materials are coming on the market and claim the virtues of each, while at the same time they eliminate their less desirable features.

When synthetic lines are on the winch heads, take great care not to surge them with winch heads rotating. Surging can cause fibers of the lines to heat and melt, freeze to the metal, and cause permanent damage to the lines. Keep bitts and winch heads in good condition when synthetic lines are used. Do not allow them to develop grooves or rough surfaces because such defects damage the lines and also cause them to grab.

Do not let synthetic lines rub against rough surfaces. Keep chocks smooth and free of rust and burs. Keep rollers free to turn. Use chafing gear or parceling as necessary. Do not drag rope over rough surfaces or sharp edges or allow it to chafe against other rope. Never use manila or wire on the same chocks or bitts in conjunction with synthetics.

Watch your mooring lines at all times, being on the alert to spot buckling of strands—a sign of unbalance. Watch for broken strands and frayed yarns. If you twist open the strands and find powdered fiber, it is a sign of internal wear. NEVER STAND IN THE PATH OF A LINE UNDER STRAIN—ESPECIALLY WITH SYNTHETICS.

. . . We do not recommend nylon stoppers under any circumstances because if the stopper parts, the man holding it has his ankles exposed when the parted end snaps back. Dacron stoppers are far less apt to snap if they do part and yet are stronger than manila. A "west coast stopper" is preferable to the single "jamming" type, and in cases where a heavy surge can be expected on mooring lines, i.e., Freeport Bunkering Anchorage, Bahamas, two west coast stoppers, one short, one long, have been successfully used.

. . . In analyzing a number of mooring line accidents in which synthetic lines were involved, we have also found that replacing manila on a "strength for strength" basis with synthetics results in a line of too small diameter to take a stopper properly and one which presents too small a surface to the face of a gypsy head or bitt for even heaving or surging when under strain. The result is that they melt and stick and then let go all at once. We definitely recommend that manila mooring lines should be replaced by synthetics on a "diameter for diameter" basis rather than a "strength for strength" one. The longer wear and, we feel, the safer handling characteristics will justify the greater initial cost.

Ships are bigger, towboats more powerful. New mooring techniques and materials must be used, and along with these must go an intensive educational program. ⚓

Arthur E. Wills, USP&I Agency

FOAM POWDER

A mate recently asked how many cans of foam powder should be carried in a T-2 and where it should be stowed.

If a ship has a steam smothering system she is not legally required to carry foam. Nevertheless we think foam is desirable from a fire protection standpoint. We think that the pumproom is the place where foam might well be used. Hence, the area of the surface that a liquid might form in the pumproom determines the amount of foam to be carried. The computation is as follows:

PROBLEM:

To compute number of cans of foam powder to be carried in company vessels.

ASSUME THAT:

1. The principal compartment that is to be protected is the pumproom.

2. In order to extinguish a fire in this space, it will be necessary to fill the space with foam to a depth of 6 feet.

3. Machinery will fill 20 percent of the space.

4. The same amount of powder will be required for vessels equipped with CO_2 in the pumprooms as for those vessels without CO_2 in the pumproom.

GIVEN DATA:

1. Length (l) and breadth (b) of the pumproom.

2. One 50-pound can of powder gives 54 cubic feet of foam.

FORMULA:

$l \times b \times 6 \text{ feet} \times 80\% + 54$
$= N$ number of cans

Now constants $= 0.089$.

So, formula becomes $l \times b \times 0.089 = N$.

Let's work this out for say, a T2, the S/SH.D. *Collier*. Her pumproom measures 14 feet 9 inches fore 'n' aft and 35 feet in beam.

So, $14.75 \times 35 \times 0.089$
$= N$ number of cans
$N = 46$ cans of powder

On some of the new construction we have arbitrarily increased the number of cans of powder as determined by this method because of the great size of these vessels. For example, using this method the allowance for the S/S *Otto N. Miller* would be 132 cans. Her allowance is 200 cans.

The *Miller* was in collision in the English Channel in March 1965. She caught fire in two cargo tanks. The crew extinguished the fire with foam. It took 100 fifty-pound cans of powder to put out the fire.

The amount of foam for a ship with a built-in system is computed by rules that are printed in the Coast Guard Tanker Regulations.

Here a mate does not have to determine the amount of foam making material to be carried. All he has to do is keep the storage tanks full.

Stowage of powder depends somewhat on the ship. Most vessels have split their powder and stowed it in two locations. There is generally half or more in the midship square and the rest in a locker aft. ⚓

From, Safety Bulletin—July 1966, Chevron Shipping Co.

GOOD SEAMANSHIP AND SAFETY GO HAND IN HAND

During normal operations of a ship many tasks in preventing mishaps or accidents are rarely thought of as being anything other than normal prudent ways of navigating a vessel. The lookout's main purpose is accident prevention. Too, a watertender's chief function is preventing accidents. The primary duty of the deck officer on watch is the safe navigation of the vessel. In thinking over these operations which are performed, and the precautions taken, it will be noted that this is more frequently expressed in terms of prudence and good seamanship than as safety measures.

An officer does not reduce ship's speed while plowing into a terrific head sea as a safety measure but rather as a routine matter of good seamanship. Taking bearings as frequently as possible in close waters, and use of the fathometer as well as all other possible means of determining the position of the vessel, are again matters of good seamanship. In fact, it will be found that the term "good seamanship" is a synonym for an accident prevention operation. Many good seamen seldom have to think of safety as such or are aware that the majority of their attention and skill is directed toward preventing accidents. It is just second nature to them.

If it were possible to integrate accident prevention into the seamanlike way of performing all operations aboard ship, then there would be very little need to worry about accident prevention as a separate category of activities. When the seamanlike method of doing a job aloft includes putting lanyards on hand tools, and life belts and lines around a man going aloft, we don't have to worry about injuries resulting from dropped tools or men falling from aloft, nor would we have to talk about safety precautions.

To be effective, accident prevention must be a normal and accepted part of the correct method of doing a job rather than a new or extra measure to be taken as a supplement to the right way to work. ⚓

Courtesy, Pacific Maritime Association

MARITIME SIDELIGHTS

Mr. L. C. Ford, President of Chevron Shipping Co. and member of AMMI (foreground) presents the Distinguished Sea Rescue Award Pennant of the American Merchant Marine Institute and National Safety Council to Mr. Charles Lockard (left) MSTS Pacific Safety Engineer; Capt. Robert E. Landry, Master of the Michelson *at the time of rescue (center) and Rear Adm. William D. Irvin, Commander Military Sea Transportation Service, Pacific (right).*

USNS MICHELSON HONORED

To mariners, seeing a "Green Cross of Safety" pennant snapping smartly from a ship's foremast, there is immediate recognition of high drama on the high seas. Flying from the USNS *Michelson* (T–AGS 23) is such a symbol, an honored reminder of her part in a rescue at sea.

On oceanographic duties off Japan in January 1965, *Michelson* received an urgent SOS from the Republic of China ship, SS *Grand,* which reported she was taking water in her hold. *Michelson* steamed immediately for the stricken freighter. Later, other units, including two U.S. aircraft and four Japanese ships, joined in search-and-rescue operations, fighting heavy seas and strong winds. From a crew of 43, 23 were rescued, 6 were found dead in the water, 14 were listed as missing and presumed drowned after a thorough but fruitless search. SS *Grand* was en route from San Francisco to Yokohama with a cargo of scrap iron when the tragedy occurred some 300 miles east of Japan.

USNS *Michelson* is assigned to the Pacific area command to collect hydrographic information on surface and subsurface temperatures, data on ocean currents, and to make studies of the earth's magnetism and gravity as part of the Nation's scientific programs. Homeported in San Francisco, she is manned by a civilian crew. ⚓

SS COTTON STATE "GALLANT SHIP"

States Marine Lines' SS *Cotton State* has been cited by the Maritime Administartion as a Gallant Ship for her part in rescuing 29 members of the sinking SS *Grammatiki* in the North Pacific on February 8, 1965. The *Cotton State* has been recently engaged in carrying military supplies for the Vietnam effort under time charter to the Military Sea Transportation Service.

In announcing the award ceremonies, Acting Maritime Administrator James W. Gulick said: "The expert seamanship displayed by the Master and crew of the *Cotton State,* coupled with the courage of those who manned the lifeboat, exemplifies not only the highest traditions of the sea, but is a tribute to the capability and willingness to aid those in distress on the part of all American merchant seamen."

During the early afternoon of February 7, 1965, the *Cotton State* was en route from Pusan, Korea, to Los Angeles, Calif., when it received six distress calls from the Greek Ship *Grammatiki.* Capt. Louis A. Thompson, the *Cotton State's* Master, immediately altered course and raced to the disabled vessel.

Later that night in heavy seas, rendezvous was made with the foundering *Grammatiki.* The *Cotton State* stood by the stricken vessel throughout the night and maintained radio contact with the U.S. Coast Guard and other vessels in the vicinity. Early the following morning a decision was made to abandon the *Grammatiki.*

The *Cotton State* launched a lifeboat in command of Chief Officer Robert A. Pease, and although heavy swells made the rescue operation extremely difficult, the boat was handled with such skillful seamanship that in less than 2 hours all 29 survivors were safely transferred to the American ship.

With the Gallant Ship designation goes the Gallant Ship Plaque for the ship, Merchant Marine Meritorious Service Medals for the master and the seven members of lifeboat crew. and Unit Citation bars for each member of the 43-man crew. Theodore F. Noldeke, the Radio Officer, receives a

Letter of Commendation for his devotion to duty in remaining at his station throughout the night-long rescue operation.

The awards were authorized by the 84th Congress under Public Law 759, to any U.S. or foreign ship which participates in outstanding or gallant action in maritime disasters or other emergencies for the purpose of saving life or property.

The Gallant Ship Plaque is a bronze medallion designed by artist Jo Davidson. It depicts a ship steaming full speed ahead. Below the ship is a bronze plate briefly relating the action for which the presentation is made. ⚓

NATIONAL CARGO BUREAU SPONSORS COURSE IN SHIP STABILITY

The National Cargo Bureau is sponsoring a self-study correspondence course in ship's stability in an effort to provide wider understanding of this important phase of merchant ship operations. Certificates will be issued to those who satisfactorily complete the course.

Capt. Hewlett R. Bishop, Executive Vice President and Chief Surveyor of the National Cargo Bureau, said his organization is undertaking the project on a nonprofit basis in response to requests received from the maritime industry. The course was originally developed for Bureau surveyors.

The National Cargo Bureau is a nonprofit membership organization dedicated to the safe stowage, securing and unloading of merchant ships and the safety of shipboard cargo handling gear. It maintains a staff of experts in this field at ports throughout the United States who inspect stowage operations and cargo handling gear and issue certificates when they meet a set of standards designed to protect cargo, the vessel, personnel and the public interest.

National Cargo Bureau is officially recognized by the U.S. Coast Guard and the U.S. Department of Labor. Certificates issued by the Bureau attesting to proper loading or the safety of cargo gear are accepted by the Government agencies. National Cargo Bureau gear certificates are also recognized and accepted by major maritime nations of the world as evidence of compliance with requirements of the International Labor Organization Convention covering safety for workers loading or unloading ships. ⚓

nautical queries

DECK

Q. (a) In hoisting a weight what part of a tackle has the greatest stress?

(b) In lowering a weight what part of a tackle has the greatest stress?

(c) What is the reason for the answers to the preceding two questions?

A. (a) The hauling part.

(b) The standing part.

(c) The reason for the answer to the preceding two questions is that to the original weight is added the successive amounts of friction at each sheave to be overcome.

Q. How would you determine the minimum diameter sheave block which you would use with wire rope?

A. Coast Guard Regulations state that the diameter of sheaves at the base of the groove must equal at least 12 times the diameter of the wire rope, when such sheaves are used for boat falls made of wire rope.

Usual practice on wire rope subject to heavy use on ship such as cargo falls is to use about 15 times the wire rope diameter as the minimum sheave diameter.

Manufacturers in general urge larger diameters, and the size of the sheave should consider not only the diameter of the wire but also its flexibility, the less flexible grades demanding larger sheave diameters. Another factor to consider is the angular change in direction which the block affords. Where the angle is less than 180° smaller size sheaves may be employed.

Q. (a) Why is a round pin shackle stronger than a screw pin shackle of the same pin diameter?

(b) What is the best method of determining the ultimate strength of shackles, hooks, rope, and other fittings in order to know the safe working load?

A. (a) Round pin shackles are stronger than screw pin shackles of the same diameter because the diameter of the pin is not reduced by threading.

(b) The best method of determining the ultimate strength is to have the manufacturer's warranty; otherwise his stated ultimate strength.

ENGINE

Q. What factors in the design and operation of marine impulse and reaction turbines create the need for axial thrust control and how is such control provided?

A. In both the reaction and impulse turbines very close clearances must be maintained between pressure stages in order to keep the steam leakage to a minimum and keep the moving and stationary parts from rubbing. In reaction turbines, there is a pressure drop across the moving blades and hence a thrust in the direction of steam. Dummy pistons and a collar-type thrust bearing are installed to counterbalance this thrust.

In the impulse type, this thrust can be balanced at certain speeds by bucket design. At any other speed, however, there exists a small unbalanced thrust. To compensate for this variable thrust, a collar-type thrust bearing is placed on one end of each turbine.

In like manner, to compensate for the propeller thrust, a larger but similar thrust bearing is placed just aft of the reduction gear.

The axial position of the rotor is determined by an indicator and means are provided in the thrust bearing for adjusting this clearance.

Q. Explain how you would continue to operate a modern steam turbine at sea, maintaining a vacuum, if an air leak developed that couldn't be corrected.

A. If an excessive amount of air is leaking into the condenser it will be necessary to use two nozzles for each stage of the air ejector in order to maintain vacuum. However, when this condition occurs you cannot expect to have as much vacuum as normally, since the increased temperature in the air ejector will cause a reduction in the possible vacuum. In order to keep the air ejector cool it may be necessary to take on a great deal of extra-feed, striking the excess down from the deaerating feed tank back to the reserve feed tank, and to recirculate water from the outlet of the air ejector back to the condenser.

Public Hearings Set on November 21, 22

Oceanographic Vessels
November 21

The Merchant Marine Council will hold a public hearing on Monday, November 21, 1966, in Room 1120, Coast Guard Headquarters, 1300 E Street NW., Washington, D.C., for the purpose of receiving comments, views, and data on the proposed rules and regulations to govern the inspection and certification of oceanographic vessels.

The Commandant, U.S. Coast Guard, will consider proposals regarding the inspection and certification of oceanographic vessels, which are being employed exclusively in instruction in oceanography or limnology, or both, or exclusively in oceanographic research, and therefore entitled to special consideration under Public Law 89–99, 46 U.S.C. 441–445). Interested persons and organizations are requested to submit written or oral comments about these proposals. The written comments should be submitted in triplicate to the Commandant (CMC), U.S. Coast Guard, Washington, D.C. 20226, prior to November 18, 1966, in order to assure consideration.

The Federal Register of October 1, 1966, Part II contains the complete text of the proposed rules and regulations together with appropriate references to statutes authorizing such regulations. Copies of this document will be mailed to persons and organizations who have made known their continued interest in the subjects under consideration by the Merchant Marine Council and have requested that such copies be furnished them. Copies of this document will be furnished, upon request to the Commandant (CMC), U.S. Coast Guard, Washington, D.C. 20226, so long as they are available. After the supply of extra copies is exhausted, copies will be available for reading purposes only in Room 4211, Coast Guard Headquarters, or at the offices of the various Coast Guard District Commanders.

In order to insure consideration of written comments and to facilitate checking and recording, it is essential that each comment regarding a section or paragraph of the proposed regulations be submitted on Form CG–3287, or separate sheets of paper, showing the section number and paragraph designation (if any); the subject; the proposed change; the reason or basis; and the name, business firm or organization (if any), and the address of the submitter. A small quantity of Form CG–3287 will be distributed with copies of the Federal Register. Additional copies of this form may be reproduced by typewriter or otherwise.

The public hearing held by the Merchant Marine Council is informal and intended to obtain views and information from those who will be directly affected by the proposals under consideration. Each oral or written comment received is considered and evaluated. If it is believed the comment, view, or suggestion clarifies or improves the wording of a proposed regulation, such proposal is changed accordingly, and after adoption by the Commandant, the regulations as revised are published in the FEDERAL REGISTER. The acknowledgment of the comments received or reasons why certain suggested changes were or were not adopted will not be furnished since personnel to handle the necessary correspondence is not available.

The purpose of the proposed rules and regulations is to establish requirements in one subchapter which will govern the inspection and certification of those oceanographic vessels coming within the provisions of Public Law 89–99 (46 U.S.C. 441–445), and are found to be oceanographic research vessels as defined in 46 U.S.C. 441, and not engaged in trade or commerce. If or when a vessel is not employed exclusively as an "oceanographic research vessel" as defined in 46 U.S.C. 441, then such a vessel will be inspected and certificated as required by the applicable inspection laws, and scientific personnel aboard then become persons employed in the business of the vessel.

It is proposed to add a new Subchapter U, entitled "Oceanographic Vessels," consisting of Parts 188 to 196, inclusive, at the end of Chapter I, in Title 46—Shipping. ⚓

Apprentice Engineers
November 22

As the *Proceedings* goes to press, a second Public Hearing has been called for November, this one to be held on November 22 for the purpose of receiving comments, views and data on the proposed rules and regulations regarding engineers which were published in the FEDERAL REGISTER of September 3.

In the FEDERAL REGISTER of September 3, 1966 (31 F.R. 11665; Vol. 31, No. 172), a Notice of Proposed Rule Making was published regarding the establishment of a seaman's entry rating as apprentice engineer and recognition of training programs for prospective Third Assistant Engineers, as well as acceptance of the completion of an approved training program as qualifying experience for a license as a Third Assistant Engineer. This announcement requested submission of written comments prior to October 1, 1966. Many requests were received asking for an extension of time for submission of comments and for consideration of the proposals at a public hearing. Extension has not only been granted but the Merchant Marine Council has decided to hold a Public Hearing on Tuesday, November 22, 1966, 9:30 a.m. in the Departmental Auditorium, between 12th and 14th Streets on Constitution Avenue NW., Washington, D.C.

Copies of these particular proposals have been mailed to persons and organizations who have expressed an active interest in this subject. Copies of the proposals may be obtained upon request from the Commandant (CMC), U.S. Coast Guard, Washington, D.C. 20226, so long as they are available. After the supply of extra copies is exhausted, copies will be available for reading purposes only in Room 4211, Coast Guard Headquarters or at the offices of the various Coast Guard District Commanders. The written comments and requests to submit oral comments should be submitted in triplicate on form CG–3287 to the Commandant (CMC), prior to November 18, 1966, in order to assure consideration or scheduling of witnesses before the Merchant Marine Council. ⚓

TITLE 33 CHANGES

BARGE LIGHTS CHANGED

The Federal Register of September 7, 1966, contains the actions of the 1966 Public Hearing with respect to "Lights for moored barges." The major change concerns the proposal to permit omission of lights on moored barges entirely when in the Illinois River north of Brandon Lock and Dam at Joliet, Ill. It was modified to permit omission of lights only in well-lighted areas. The regulations identify the areas where such lights may be omitted.

Amendments to 33 CFR 80.16a(h), and 95.36 are reprinted below. Section 95.35 "Lights for Barges at Bank" is canceled.

Lights for Certain Classes of Vessels

Section 80.16a(h) is amended to read as follows:

§ 80.16a Lights for barges, canal boats, scows, and other nondescript vessels on certain inland waters on the Gulf Coast and the Gulf Intracoastal Waterway.

* * * * *

(h) Lights for moored barges shall be as described in this paragraph.

(1) The following barges, when moored in or near a fairway, shall display between the hours of sunset and sunrise the barge lights described in subparagraph (2) of this paragraph:

(i) Every barge projecting into a buoyed or restricted channel.

(ii) Every barge so moored that it reduces the available navigable width of any channel to less than 250 feet.

(iii) Barges moored in fleets more than two barges wide or to a maximum width of over 80 feet, parallel to the bank.

(iv) Every barge moored to the bank in any manner other than parallel thereto.

(2) Barges required to be lighted under subparagraph (1) of this paragraph shall carry two white lights of such character as to be visible on a dark night with a clear atmosphere at a distance of at least 1 mile, so located as to give unobstructed view and arranged as follows:

(i) On a single moored barge, a light on each outboard or channelward corner.

(ii) On barges moored in group formation, a light on the upstream outboard or channelward corner of the outer upstream barge and a light on the downstream outboard or channelward corner of the outer downstream barge. In addition, any barge projecting toward or into the channel in such a group formation shall have two white lights similarly placed on the outboard or channelward corners of the barge.

(3) Barges moored in any slip or slough which is used primarily for mooring purposes are exempt from the lighting requirements of this paragraph.

* * * * *

Lights for Ferryboats and Barges

§ 95.35 [Canceled]

1. Section 95.35 *Lights for barges at bank* is canceled. (The revised requirements are in § 95.36.)

2. Section 95.36 is amended to read as follows:

§ 95.36 Lights for barges at bank or dock.

(a) Lights for barges at bank or dock in the Mississippi River and its tributaries and in the Atchafalaya River above its junction with the Plaquemine-Morgan City Alternate Waterway shall be as required by this section.

(b) The following barges, when moored in or near a fairway, except those barges exempted under the provisions of paragraph (e) of this section, shall display between the hours of sunset and sunrise the barge lights described in paragraph (c) of this section:

(1) Every barge projecting into a buoyed or restricted channel.

(2) Every barge so moored that it reduces the available navigable width of any channel to less than 250 feet.

(3) Barges moored in fleets more than two barges wide or to a maximum width of over 80 feet, parallel to the bank.

(4) Every barge moored to the bank in any manner other than parallel thereto.

(c) Barges required to be lighted under paragraph (b) of this section shall carry two white lights of such character as to be visible on a dark night with a clear atmosphere at a distance of at least 1 mile, so located as to give unobstructed view and arranged as follows:

(1) On a single moored barge, a light on each outboard or channelward corner.

(2) On barges moored in group formation, a light on the upstream outboard or channelward corner of the outer upstream barge and a light on the downstream outboard or channelward corner of the outer downstream barge. In addition, any barge projecting toward or into the channel in such a group formation shall have two white lights similarly placed on the outboard or channelward corners of the barge.

(d) Barges moored in any slip or slough which is used primarily for mooring purposes are exempt from the lighting requirements of this section.

(e) Barges moored in well-illuminated areas of the Illinois River north of Brandon Lock and Dam at Joliet, Ill., shall not be required to display the lights prescribed in paragraph (c) of this section. These areas are as follows:

Chicago Sanitary Ship Canal

(1) Mile 293.2 to 293.9—Material Service Corp.

(3) Mile 295.2 to 296.1—Material Service Corp. and Commonwealth Edison Co.

(5) Mile 297.5 to 297.8—Pure Oil Docks.

(7) Mile 298 to 298.2—Ceco Steel Docks.

(9) Mile 298.6 to 298.8—Lemont Manufacturing Co.

(11) Mile 299.3 to 299.4—Mechmar Development Co.

(13) Mile 299.8 to 300.5 (Stephen Street Bridge)—Tri-Central Oil Co.

(15) Mile 303 to 303.2—North American Car Corp.

(17) Mile 303.7 to 303.9—Hannah Inland Waterways Transportation Co.

(19) Mile 305.7 to 305.8—Publicker Chemical Co.

(21) Mile 310.7 to 310.9—Shell Oil Co.

(23) Mile 311 to 311.2—General American Tank Storage Terminal.

(25) Mile 312.5 to 312.6—Trumbull Asphalt Co.

(27) Mile 313.8 to 314.2—Lake River Oil Terminal.

(29) Mile 314.6—Waterways Terminals, Inc.

(31) Mile 314.8 to 315.3—Commonwealth Edison Co. and Material Service Corp.

(33) Mile 315.7 to 316—Sanitary District Rock.

(35) Mile 316.8—Whitewater Petroleum Terminal Co.

(37) Mile 316.85 to 317.05—Hughes Oil Co.

(39) Mile 217.5—Socony Vacuum Oil Co.

(41) Mile 318.4 to 318.9—Commonwealth Edison Co.

(43) Mile 318.7 to 318.8—Bell Oil Co.

(45) Mile 320 to 320.3—Globe Fuel & Humble Oil.

(47) Mile 320.6—American Sugar Refining Co., South Branch of Chi-

cago River and Chicago River.
(49) Mile 322.3 to 322.4—Commonwealth Edison Co.
(51) Mile 322.8—Time, Inc.
(53) Mile 322.9 to 327.2.

Calumet Sag Channel

(61) Mile 316.5—Marine Oil Co. unloading piers.

Little Calumet River

(71) Mile 321.2—Pump house outfall.
(73) Mile 322.3—South bank.

Calumet River

(81) Mile 328.5 to 328.7—Cargill Grain Elevator.
(83) Mile 329.2 to 329.4—Continental Grain Elevator.
(85) Mile 330, west bank to 330.2.
(87) Mile 331.4 to 331.6—Rail to Water Transfer Corp.
(89) Mile 332.2 to 332.4—Dundee Cement Co.
(91) 332.6 to 332.8—Material Service Corp.

APPROVED EQUIPMENT

COMMANDANT ISSUES EQUIPMENT APPROVALS; TERMINATES OTHERS

By Commandant's Action of August 31, 1966, Coast Guard Approval was granted to certain items of lifesaving, firefighting, and other equipment and terminated for others. Included among the approvals were life preservers, lifeboat winches, flame safety lamps, lifeboat sea anchors, lifefloats, shoulder gun line-throwing appliance, davits, lifeboats, jackknives, lifeboat bilge pumps, buoyant vests, buoyant cushions, work vests, desalter kits, lifeboat protective covers, safety valves, relief valves, flame arresters, gauging devices, and for some incombustible materials. Terminations were issued for certain life preservers, cork ring life buoys, buoyant apparatus, lifeboat winches, liferafts, davits, mechanical disengaging devices, lifeboats, buoyant cushions, inflatable liferafts, work vests, flame arresters, structural insulations and for some incombustible materials.

Those interested in these approvals and terminations should consult the Federal Register of September 8, 1966, for detailed itemization and identification.

STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from September 1 to September 30, 1966, inclusive, for use on board vessels in accordance with the provisions of Part 147 of the regulations governing "Explosives or Other Dangerous Articles on Board Vessels" are as follows:

CERTIFIED

Aetna Chemical Corp., Wallace Street Extension, East Paterson, N.J., Certificate No. 684, dated September 6, 1966, ACTELENE and FLYING "A" DEGREASE SOLVENT;

J. F. Kerns Industries, 9734 Klingerman Street, South El Monte, Calif., Certificate No. 689, dated September 19, 1966, KERNS MARINE GLOW;

Petrolite Corp., 369 Marshall Avenue, St. Louis, Mo., Certificate No. 685, dated September 7, 1966, DS–615; Certificate No. 686, dated September 7, 1966, DS–617; Certificate No. 687, dated September 7, 1966, DS–624; Certificate No. 688, dated September 7, 1966, JN–2987;

Star Industries, Inc., Post Office Box 169, Parsippany, N.J., Certificate No. 690, dated September 27, 1966, MARLINE 55; Certificate No. 691, dated September 27, 1966, MARLINE 100; Certificate No. 692, dated September 27, 1966, MARLINE 110; Certificate No. 693, dated September 27, 1966, MARLINE 120; Certificate No. 694, dated September 27, 1966, MARLINE 227; Certificate No. 695, dated September 27, 1966; MARLINE 245; Certificate No. 696, dated September 27, 1966; MARLINE DBTC.

AFFIDAVITS

The following affidavits were accepted during the period from August 15, 1966 to September 15, 1966:

Golden Anderson Valve Specialty Co., 1232 Ridge Avenue, Pittsburgh, Pa. 15233, VALVES.

Royal Industries, Inc., 1427 South Garey, Pomona, Calif. 91766, VALVES.[1]

CHANGE OF ADDRESS

Hale Co., Post Office Box 2679, Tulsa, Okla., 74101, VALVES.

The Lunkenheimer Co., Post Office Box 14360, Cincinnati, Ohio 45214, VALVES, FITTINGS, and CASTINGS.

[1] Cryogenic butterfly valves only.

BUOYS

(*Continued from page 221*)

of about 2 feet, and displaces about 8 tons.

The next areas in importance for moored buoys at sea are those of the deep moors found in or near the tongue of the ocean in the Bahamas. The first of these is at 24°30′ N., 77° 32.5′ W. It contains seven large lighted buoys on the surface in a radial pattern; these are being used to moor vessels engaged in oceanographic research. There is a single lighted buoy at 24°48.5′ N., 77°37′ W., and another at 24°39.7′ N., 76° 26.6′ W. The latter is located in Exuma Sound. These deep moors have been established for securing vessels during acoustic and oceanographic studies for the Navy's Atlantic Undersea Test and Evaluation Center (AUTEC). Offshore towers have been erected at 24°20.9′ N., 77°40.4′ W.; 24°13.3′ N., 77°36.0′ W.; 23°54.5′ N., 77° 28.6′ W. These structures act as focal points for submarine cables in the tongue of the ocean.

A NOMAD type buoy powered by a nuclear reactor has been stationed in the Gulf of Mexico at 25° N., 90° W. One powered by conventional means has been positioned 25 miles southeast of Bermuda. Another was located southwest of San Diego at 30° 40.5′ N., 119°40.0′ W., early in the spring of 1966. Still another is planned to be stationed off Halifax. Nova Scotia. This buoy is to be operated by the Canadian Department of Transport.

The Environmental Sciences Service Administration plans to have two NOMAD type buoys in the Gulf of Mexico at 26.9° N., 93.9° W., and 22.1° N., 94.0° W. These buoys are classified as Marine Automatic Meteorological Observation Stations (MAMOS). The Coast and Geodetic Survey employs a scaled-down version of the NOMAD buoy to measure tidal currents. From this device, which is 10 feet by 5 feet by 4½ feet, a number of torpedo-shaped radio current-measuring devices are suspended. Over 30 such buoys are now in use and are tended by 14 Coast and Geodetic Survey vessels. Approximately one-third of these buoys are being utilized in the Long Island Sound area.

By far the largest scientific buoy today is the "Monster Buoy," one of which is stationed off Bermuda at 32°11′ N., 65°11′ W. This buoy is 40 feet in diameter, has a 51-foot mast, a white light showing five flashes every 30 seconds, a red hull, and an international orange and yellow deck. It is similar to the buoy now planned to replace the former *Scotland* Light Vessel off Sandy Hook, N.J.

The preceding account of scientific and tactical buoys is not intended to be complete, but it does give an indication of general areas in which these floating devices may be encountered. More complete, up-to-date information about their light characteristics, colors, sizes, and exact locations may be found in the Daily Memoranda published by the U.S. Naval Oceanographic Office.

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 may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Subscription rate is $1.50 per month or $15 per year, payable in advance. Individual copies may be purchased so long as they are available. The charge for individual copies of the Federal Register varies in proportion to the size of the issue but will be 15 cents unless otherwise noted in the table of changes below. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated January 1, 1966 and Supplement dated July 1, 1966 are now available from the Superintendent of Documents, price basic book: $2.50; supplement: 60 cents.

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 (8–1–62).
115	Marine Engineering Regulations and Material Specifications (3–1–66).
123	Rules and Regulations for Tank Vessels (5–2–66).
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.
172	Rules of the Road—Great Lakes (6–1–62). F.R. 8–31–62, 5–11–63, 5–23–63, 5–29–63, 10–2–63, 10–15–63, 11–5–64, 5–8–65, 7–3–65, 12–22–65, 7–30–66, 8–2–66.
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 (1–3–66).
182	Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
184	Rules of the Road—Western Rivers (6–1–62). F.R. 1–18–63, 5–23–63, 5–29–63, 9–25–63, 10–2–63, 10–15–63, 4–30–64, 11–5–64, 5–8–65, 7–3–65, 12–8–65, 12–22–65, 2–5–66, 3–15–66, 7–30–66, 8–2–66, 9–7–66.
190	Equipment lists (8–3–64). F.R. 10–21–64, 10–27–64, 3–2–65, 3–26–65, 4–21–65, 5–26–65, 7–10–65, 8–4–65, 10–22–65, 10–27–65, 1–27–66, 2–2–66, 2–5–66, 2–10–66, 3–15–66, 3–24–66, 4–15–66. 9–8–66.
191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (2–1–65). F.R. 2–13–65, 8–21–65, 3–17–66.
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (10–1–63). F.R. 11–5–64, 5–18–65.
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 (7–1–64). F.R. 6–3–65, 7–10–65, 10–9–65, 10–13–65, 3–22–66, 7–30–66, 8–2–66.
249	Merchant Marine Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (5–2–66).
257	Rules and Regulations for Cargo and Miscellaneous Vessels (1–3–66). F.R. 4–16–66.
258	Rules and Regulations for Uninspected Vessels (1–2–64). F.R. 6–5–64, 6–6–64, 9–1–64, 5–12–65, 8–18–65, 9–8–65.
259	Electrical Engineering Regulations (7–1–64). F.R. 2–13–65, 9–8–65.
266	Rules and Regulations for Bulk Grain Cargoes (7–1–64). F.R. 3–10–66.
268	Rules and Regulations for Manning of Vessels (2–1–63). F.R. 2–13–65, 8–21–65.
270	Rules and Regulations for Marine Engineering Installations Contracted for Prior to July 1, 1935 (11–19–52). F.R. 12–5–53, 12–28–55, 6–20–59, 3–17–60, 9–8–65.
293	Miscellaneous Electrical Equipment List (4–1–66).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (10–1–59). F.R. 10–25–60, 11–3–61, 4–10–62, 4–24–63, 10–27–64, 8–9–66.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (1–3–66).
329	Fire Fighting Manual for Tank Vessels (4–1–58).

CHANGES PUBLISHED DURING SEPTEMBER 1966

The following have been modified by Federal Registers:
CG–169 and CG–184, Federal Register, September 7, 1966.
CG–190, Federal Register, September 8, 1966.

U.S. GOVERNMENT PRINTING OFFICE:1966


JAPAN