PROCEEDINGS OF THE

MERCHANT MARINE COUNCIL

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Proceedings of the

MERCHANT MARINE COUNCIL

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FRONT COVER

An aerial view of the rescue operations as the SS *Harry Culbreath* rescued the crew of a flying boat, disabled in the Pacific Ocean. The plane was also salvaged. A lifeboat from the ship can be seen returning to the *Harry Culbreath* moments after removing the plane crew. Photograph courtesy *Lykes Fleet Flashes.*

BACK COVER

Looking forward on the SS *Esso Scranton* as she steams along with a fair wind. Photograph by Radio Officer, Charles E. Warren.

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THE OCEAN

Thou glorious mirror, where th' Almighty's form
Glasses itself in tempests, in all time,
Calm or convulsed, in breeze, or gale, or storm,
Icing the pole, or in the torrid clime,
Dark-heaving;—boundless, endless, and sublime,
Th' image of Eternity,—the throne
Of th' Invisible; even from out thy slime
The monsters of the deep are made; each zone
Obeys thee; thou goest forth, dread, fathomless, alone.
And I have loved thee, Ocean! and my joy
Of youthful sports was on thy breast to be
Borne, like thy bubbles, onward.

Byron

NEW CHIEF OF OFFICE MERCHANT MARINE SAFETY

SINCE last summer, when Admiral Shepheard announced plans for his retirement, there has been much speculation as to who would succeed him as Chief of Office Merchant Marine Safety.

The speculation ceased on February 9, 1956, when the U. S. Coast Guard announced that Captain Henry T. Jewell would succeed Admiral Shepheard effective May 1, 1956.

Captain Jewell is now Chief of Staff, 12th Coast Guard District at San Francisco, Calif. He was recently nominated by the President for the rank of Rear Admiral, to be effective May 1, 1956.

On confirmation by Congress of this appointment, Captain Jewell achieves a goal rarely realized by an officer up from the enlisted ranks. The Captain, who now has more than 30 years of service, enlisted as a seaman in 1923. He was commissioned as Ensign in 1924 and continued his rise in rank to his present position.

During his Coast Guard career, Captain Jewell has had many assignments which gave him direct experience with Merchant Marine Safety work. From 1938 to 1944 he served successively as Assistant Chief and then Chief of the Maritime Service; and as Chief, Merchant Vessel Personnel Division. While serving in the latter position, he headed a special investigation concerning pilotage procedures. As a result of his service he was awarded the Navy Commendation Ribbon.

His next assignment was aboard the troop transport USS *Wakefield*. In April 1945, he became senior Coast Guard Merchant Marine Detail Officer in London, England. He returned to Washington in September of that year, and served as Chief, Merchant Vessel Personnel Division until 1952. In 1948, he accompanied the U. S. Delegation as an advisor to the International Conference on Safety of Life at Sea held in London.

It is evident from the foregoing that Captain Jewell is no stranger to the field of Merchant Marine Safety.

CAPTAIN HENRY T. JEWELL

HOW THEY PERFORM*

By Captain R. O. Patterson, SS American Manufacturer

WHEN a ship leaves a builder's yard it is a marvel to behold, since a lot of thought and effort has gone into making that floating machine an efficient one that can stand up to anything the elements may throw at it. Yet nothing is ever perfect, and a ship's designer and builder will wonder many things about their handiwork. How will new innovations work out? How will the ship be handled by those who man her? What kind of a sea boat will she turn out to be? What? How? Why? Those are the questions.

Eventually answers to most questions arrive in the form of piles of logbooks, abstracts, stylized reports—then come the odd stories. A Captain howls vociferously that his ship rolls fiercely, another proudly states his ship is a beautiful sea boat; an Engineer bemoans his fuel consumption, another blandly submits reports to the contrary; a Steward complains bitterly about the arrangement of the galley, another is quite satisfied. And all the stories come in with one thing in common—none is accompanied by any practical suggestion based on a thorough study of the problem.

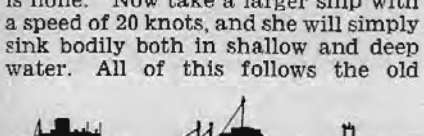
In the following, this author intends merely to report some experiences in which certain features of design were put to work, sometimes in the manner intended, sometimes differently. There is no criticism, and only one lone suggestion appended after all discussion, or rather, narration, has been completed.

TRIM

As a starting point, suppose we consider a ship's trim, bearing in mind that loading and discharging cannot always be controlled as one wishes, so that, when a ship goes to sea, the actual trim can often be a matter of guesswork.

What happens?

If the ship is an average carrier, that is to say, something akin to a C–2, C–3, or Victory, in size and speed, certain results will be noticed. Load 'em deep, and they squat by the stern like a duck in a gravy bowl while in shallow water, but once at sea the bow will drop from 4 to 5 feet. At half load the bow dip is no more than 2 or 3 feet and with a light load there is none. Now take a larger ship with a speed of 20 knots, and she will simply sink bodily both in shallow and deep water. All of this follows the old formula based on a factor derived from volume divided by the square root of the length, and it works.



So, what do we mariners do with this knowledge? Obviously use it to achieve the most favorable trim for the ship.

Discarding the ancient theory of trimming by the stern to obtain a planing effect—something long ago discarded by naval architects but still stubbornly clung to by many ancient mariners—and working on the belief that modern flat-bottomed ships steam best on even keel when the flow of water to the propeller is at its best, one may see that a fully laden cargo ship going to sea with a 5-foot drag will turn out its best performance. Suppose though, the ship goes to sea on an even keel? About the only thing noticeable will be the anticipated dip of the bow. Speed does not seem to be affected in any appreciable manner, and this would appear to indicate a clear flow of water to the propeller with no increased eddies along the water plane. On the other hand, send the same ship to sea with a 10-foot drag and there is a lot of difference. First the bow drops, but not as much as anticipated; next there is increased turbulence and disturbance of water flow clearly visible in the wake; and finally, there is a loss of speed. Maybe this last is not much, say 0.2–0.4 knot in a 15-knot ship, but when prorated over a voyage of several thousands of miles, a lot of good dollar bills go up the stack in the form of wasted B. t. u.'s.

Controlling trim

Now, what is done to control trim through use of factors built into the ship by demands of length, displacement, and speed? Well, if the vessel happens to be fully laden or is a passenger ship with scant variation in displacement, all one can do is consume fuel and water from one end or the other to achieve the nearest approach to good trim. However, with a partially laden cargo ship there is room for initiative, for the lighter the ship, the more effective is a transfer of weight, and favorable trim may be obtained. But, if a ship is empty or nearly so, it is an abomination which is not only losing money, it is also a headache to handle. Even with all fuel and water tanks full to capacity, a light ship is no more than a chip on the waves, something buffeted by each passing swell and blown thither and yon by every passing breeze, and it is a matter of grim record that most founderings occur with light ships.

Some ships solve the problem of emptiness by use of cargo deep tanks built into holds, and while the author does not know who originated the idea of cargo deep tanks, he could hug that man like a brother. Only a shipmaster may know the feeling of satisfaction experienced in a light ship which has, thanks to the foresight of an unknown designer, three or four thousand tons of water ballast advantageously placed in the holds, thereby giving the ship a good grip in the water. Even with half load, those tanks prove valuable in maintaining adequate displacement and favorable trim, and with empty ships such tanks are worth their weight collectively in gold.

Now then, we have the ideal use of facilities incorporated into the design of a ship by an architect looking ahead, not astern. Unfortunately, as is well known, only a small percentage of ships are equipped with cargo deep tanks, and the way seamen aboard less fortunate craft handle their ships when light is a story of head and heartaches beyond tally. To learn, we have but to study empty Libertys yearly pounding over the seas, and when we say pound, we mean just exactly that—pound. These workhorses have, through necessity, developed their own techniques with many of them quite bizarre.

Liberty methods

Some Libertys pile their ballast in Nos. 2 and 3 'tween decks, then stick a hose in No. 5 hold and fill it up to a couple feet over the shaft tunnel, thus holding down the stern. Others dump a lot of water into No. 3 hold, put on the 'tween deck hatch boards and then pile a load of ballast on top. There are as many tricks as ships, and regardless of what the seamen do, comparatively few Libertys are lost, which is a tribute alike to designer, builder, and seaman.

Perhaps one of the most unusual incidents of an empty ship surviving severe weather through unconventional use of certain facilities built into the ship concerns a Liberty that cracked open at No. 3 hatch. Light, pounded by heavy seas, with a gap across the main deck yawning open and closing with a snap, held in one piece only by the double bottoms, that ship nonetheless made port—with the forward and after ends tied together

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*Condensed from a paper presented at the Annual Meeting of the Society of Naval Architects and Marine Engineers, New York, N. Y., November 9–12, 1955.

by every wire and rope to be found on the ship! Truly, a most unconventional use of ship's equipment and in a manner no designer ever dreamed of, even in a nightmare.

Then there was the Canadian built Liberty with no bottom left that came sailing merrily into an American port, supported on compressed air pumped into the hold by an amateur salvor who took over after the professional declared the job hopeless. The ingenious person used the mast houses as airlocks, and along with a few other built-in features put all to work successfully, even to altering trim by changing the pressure of air in the holds!

Another unusual way of trimming ships to achieve results under awkward conditions is occasionally resorted to by small colliers plying the North and Irish Seas. These ships carry a single load, full one way, empty the other. An American Captain had the opportunity once of observing a small collier caught by wind and tide off the entrance to Liverpool, England. Against a 35-mile-per-hour wind the empty craft couldn't get its bow into the gale and seemed to be just lying helpless, beam to the sea, in danger of drifting onto sand shoals when the tide shifted. Yet the situation wasn't hopeless at all. In fact, the skipper of the collier wasn't the least bit worried. When he couldn't get his little ship headed into the wind, he filled her after hold by means of a fire hose, got the stern well down and propeller deep in the water, and then went full astern. Away went the little collier, straight against the offshore gale, with the high bow acting like the vertical stabilizing fin on an airplane!

What was more, half an hour later another empty collier was sighted doing the same thing—sailing backwards.

Subsequent investigation, pleasantly conducted in those pubs frequented by collier men, brought to light the fact that many a North Sea collier has ridden out a storm by such methods.

ROLLING

Perhaps the greatest hazard to cargo, passengers, and comfort, is the unpleasant motion known as rolling, for when wallowing about in a heavy sea a ship can do more tricks than a monkey with a ball of string. Add to strange gyrations and heaves, cargoes smashing out of cases to go rampaging about holds, passengers that delight in falling out of bed or jamming fingers in doors, and days on end when one can barely maintain balance, then it is easy to see why the seaman hates rolling with all his heart. Also, it is with rolling that the problem of stability goes hand in hand—two evil imps combining efforts to make life miserable for the shipmaster.

A C–2 experience

As a simple example of what a vessel can do when rolling, suppose we take an incident which occurred some 7 years ago. The ship, a Wilmington, N. C. class of C–2, loaded 1,200 tons of army tanks in Bremen, Germany, and after being assured by agents that about 700 tons would be available in Le Havre, France, for stowage in the upper 'tween decks, the tanks were placed in all lower holds save No. 4, where the lower hold space was divided into four deep tanks through the lids of which the army tanks would not fit. However, the deep tanks were filled with water ballast to put the ship in good trim, and then left slack so as to reduce the excessive GM. With the prospect of sufficient cargo in Le Havre for high stowage the Captain was quite satisfied although he would have preferred a bit more weight up above.

What happened?

Upon arrival in Le Havre it was learned the 700 tons had vanished and there were a scant 60 to load! What a prospect—midwinter, a ship with far too much bottom weight, and a stormy ocean to cross.

One week later the C–2 was undergoing all the effects of poor loading when, in a high, confused sea, with swells racing in from three directions, that ship rolled 47° to each side, and did it in a 10-second period. Five seconds from 47° port to 47° starboard, and 5 seconds back again. It was, to put it mildly, one hell of a mess. Changing course was useless, for seas rolled in at an awkward angle no matter which heading the ship was on, and all that reducing speed accomplished was to ease off pitching. With such an extreme GM that ship tended to remain perpendicular to the surface of the water after the most approved theory of rolling, and if the seas happened to be unusually high or steep, all well and good, she still managed to stick straight out from the wave surface.

On the bridge the Captain had given up trying to find an easy heading or a comfortable speed and contented himself with hanging on for grim life, wondering what the roll would be like without the free surface in the deep tanks. Then, in a flash, he saw how to do something useful. Those tanks had been well designed with a means, as a damage control measure, of counter flooding through a large sluice-gate valve controlled by a reach-rod extending to the main deck. At the time the ship was rolling so extremely the valve was closed, but 60 seconds after the dawn of light in the Captain's head, the valve was open and water cascading merrily through the sluice. Almost immediately the rolling shrank to a mere 35°, and the roll period increased from 10 seconds to 12.

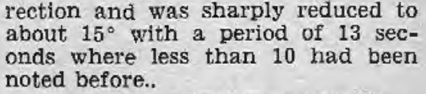
Later, the ship proceeded without any more hair-raising experiences, yet, no one who rolled through an arc of 94° in 5 seconds is likely to forget it. The Captain didn't, that's sure, nor did he forget the use of the sluice gate and the value of a facility built into the ship for a purpose to which it was admirably adapted but most likely never intended.

Easing a roll by sluicing water ballast from one tank to another is by no means the prerogative of cargo ships with deep tanks. Far from it. Large passenger ships often do the same thing, and on the SS *Washington* it was standard procedure to slack off certain cross-connected tanks, while on the SS *America* the same procedure was often gratifying to the extent of reducing roll by some three degrees.

Fuel tanks as stabilizers

Another example of cargo making a ship overly stable occurred when a C–2, carrying a full load, had to stow a great deal of copper and steel in the lower holds due, mainly, to that deck being the only one with sufficient strength to support the highly concentrated weight. Although other cargo was stowed as high as possible, the ship sailed with a GM three times that required, and, 12 hours after leaving port, she was rolling 25° each way in a seaway that, at the worst, could display no waves more than 15 feet high. Once again slack tanks were brought into play, this time fuel tanks. Hurriedly shifting oil about, all double bottoms were slacked off and the oil heated just enough to make it sluggish. The results were excellent, for, as the ship rolled, the oil barely got in motion when the return roll encountered it in an opposite direction and was sharply reduced to about 15° with a period of 13 seconds where less than 10 had been noted before..

As an extreme in the opposite direction, the same C–2 wound up with a theoretical GM of less than zero and an ocean to cross in winter. Still, it wasn't as bad as it sounds, for a rough sine curve showed a righting arm forming at an angle of heel of 5° and increasing steadily up to 50°. That passage across was a weird one,



though, for the least puff of wind heeled the ship over to 10° but once that far, it rolled no more and just lifted up and down on the seas.

There is a big difference in ships, even those of supposedly similar classes, and had the C–2 just mentioned been an East coast class or a Victory, the idea of dampening the roll by sluggish oil wouldn't have worked, for where the West coast type of C–2 has double bottoms divided into port and starboard, the East coast ships have them further subdivided into inboard and outboard tanks while the Victorys have three tanks spread across the double bottoms. Nevertheless, these double-bottom tanks have been put to work to assist in easing rolling by pressing up the outboard tanks and emptying the inboard or center ones, thus controlling roll to some extent by a distribution of weight rather than by free-surface effect. The idea is not novel, having been used on large passenger ships with wing tanks for years, and the theory is an old one with the Navy, yet it is rather new aboard cargo ships.

The cases already discussed are but a smattering of many similar ones, some good, some awkward; *but,* in every case there was something built into the ship which, when correctly used, served to minimize rolling even if the facilities used were not so intended.

Effect on speed

Perhaps one effect of rolling that does not follow the dictates of theory is the effect of rolling upon speed. It is all very well and good to list a ship, or a test basin model, and run it in smooth water while studying the results which indicate little appreciable reduction in speed. It is another thing to watch a heaving ship when rolling in a severe sea. Under the latter condition the turbulence along sides and bottom is terrific as, with each movement, thousands of tons of displaced water boil up alongside and can be seen swirling about in the slip stream aft with enough force to destroy the normal wake. Naturally, a disturbance of that kind hampers the calculated waterflow along a ship's bottom, until, at an angle of roll that will vary for an individual ship, speed begins to fall off by a considerable amount. Then too, speed can fall off as a result of difficulties encountered with a ship's power plant when undergoing extreme rolling, and while that phase is a study in itself, anyone who has tried to maintain full power when a ship is rolling 30° or more will agree that the motion creates its own hazards in the engineroom.

"ALL ASHORE THAT'S GOING ASHORE!"

(Courtesy Maritime Reporter)

Loading for stability

Now we come to the next phase, what the shipmaster does to prevent rolling before he gets to sea. Obviously the best way is to load the ship with the view in mind of acquiring perfect stability, but, unfortunately, that isn't always practical. When a ship is loaded full, the normal use of space will generally result in a reasonable approach to the required GM, and, as explained in previous examples, the use of facilities built into the ship can be adapted to further one's needs. The half-loaded ship, however, needs careful watching with a preliminary study of the moments required compared with the moments expected when loading is completed. Along this line those lovely deep tanks again come into play on ships fortunate to have 'em, for two of these tanks will increase the GM of a C–2 by a foot, and slacked well down will decrease said GM by half a foot. A very valuable installation, those tanks, one that has paid for the costs of original construction a dozen times over in preventing excessive rolling with resultant damage to cargo.

As a final discussion on the subject of rolling it might be of interest to know how a shipmaster handles his ship after all facilities built into it through the foresight of the designers have been exhausted.

Common sense indicates the most practical way to ease a rolling ship is to change course, and radically. Nine times out of 10 this will do the trick, although where the ship may fetch up is something different. On one occasion, two ships left New York at the same time, one a C–2, the other a Victory, and both bound for Europe. Shortly after getting well to sea they encountered a rip snorting northerly gale and despite being in the lee of Long Island began to roll badly. The C–2 promptly headed south, reduced speed, and spent the night drifting idly before an ever-increasing wind and sea; the Victory stuck close to Long Island but, when that bit of land inconveniently ended, then she too had to run before the sea. Thirty hours later the 2 ships were but 15 miles apart straight east of Chesapeake Bay! Both had done the only thing possible under the circumstances, and both fetched up about 200 miles further from their ultimate destinations than when they started.

Next to changing course the best way to reduce rolling is to reduce speed, thereby radically changing the period of encounter with roll-producing waves. Also, a ship, when rolling, can be compared in a rather extreme way with a baseball pitched with a curve; the harder the ball is thrown, the more it curves. So it is with a rolling ship, the more speed at the critical angle of encounter with the sea, the more the roll. There are, of course, a few occasions when the critical angle of encounter may be altered by an increase of speed, yet one must remember that the average merchant ship operates at near maximum speed and has nothing it can increase to. Ergo, to ease rolling when a change of course is not practical, the shipmaster reduces speed.

Good

Finally when all else fails, the shipmaster can still do two things; pray or swear. Few can do the first, more are artistically letter perfect with the second, and, indeed, it is a wonderful comfort in moments of frustration.

PITCHING

After rolling, we come to pitching, and although the longitudinal movement of ships creates less damage to cargo and passengers than rolling, pitching is no parvenue to destruction. Observe the corrugated bottoms of ships after a winter in the higher latitudes; the ribs stick out like those of a starving animal, and even a novice need not look twice to realize that two opposing forces have been in collision. Aye, there is no movement as violent as the head-on shock of heavy pitching. All the ceaseless struggle between man-made machine and the fury of the elements is personified in that movement. Up, up, high into the air, through the crest of an oncoming wave, out over nothing, hanging for a brief moment in suspended movement, and then a dive downward with sickening speed followed by a shock and lurch as thousands of tons of ship crash into thousands of tons of moving water, and then the ship smashes through to clear the wave and tackle the next one.

Seamen know it all too well, and the experienced shipmaster can tell almost to the quarter of a knot just what his ship can carry without incurring damage. Exceed that speed, and the ship will either pound on top of oncoming seas, or dive into them. Of the two movements, pounding is by far and large the worst. Naturally, a reduction of speed will usually halt pounding, yet there are times when such reduction is a greater danger than pounding, and that in itself is a story.

Another C–2 experience

Off the Grand Banks one winter, a C–2 was working against a southerly wind and westerly swell at a sedate 60 r. p. m. All indications were that a small local storm was brewing, but neither weather reports nor the Captain's own weather maps indicated anything unusual in the vicinity. Along about 11 p. m. the southerly wind died out and heavy rain set in, clearly indicating a cold front was due even as anticipated.

Then all hell broke loose in one fell swoop.

Something akin to a giant's hand smote the ship on the starboard side, knocked it 50° off course, shoved it over to a 20° list, and 10 million banshees screamed through the air at once even as the sea arose like a white cloud to bury the main deck in a seething cauldron of spume. Hard-over rudder failed to budge the ship from its forced heading beam to the wind and it was swept along as though it were a child's toy in a bathtub. Increasing speed to 15 nozzles still wouldn't bring that vessel up into the wind, and not until 18 nozzles were applied did the bow mosey sluggishly in the desired direction. Even at that, hard-over rudder was required to maintain bare steerageway.

Once the ship was heading into the wind the Captain's worries were not over. In fact, they had just begun. First his little anemometer blew away as the wind hit 135 miles per hour, then the radar antenna could no longer turn against the extraordinary pressure, and finally the ship began to plunge into troughs and seas hidden under 30 feet of boiling spray. It was the last effect that set him to wondering whether to start chewing the nails on his right hand or those on his left, for the invisible seas arose from beneath the blanket of spume with frightening rapidity. If he reduced speed to avoid diving heavily into such steep and violent waves the vessel would have broached to, broadside to the wind, which by then was at its peak, and if he didn't slow down there was an excellent risk and good odds that the ship would suffer damage. It was a case of be damned if he did and be damned if he didn't.

Nature to the rescue

Then the solution arrived, unheralded, and delivered by Nature itself. A wind can whip up a dirty sea in a short time, yet, there is a point of maximum effect, after which the wind begins to flatten wave crests through sheer surface pressure. On that wild night off the Banks when a C–2 was barely holding its own, such a phenomenon occurred. As each wave rose from the level of the sea, the shrieking wind swept the top of it away as though with a mighty broom and sent thousands of tons of water swirling into the night. When the ship slipped over the reduced crests and stuck its bow into the wind, the pressure halted it dead in its tracks and eased it down into the troughs with a gentleness all the more startling due to the wildness of the weather.

Oh, that was a night to remember, all right, and the full fury lasted for 6 hours, yet the ship rode it out easily and as the wind decreased the seas regained full height, but by then speed could be reduced.

When all was over, everyone gave a sigh of relief, but the Captain's was really a gusty one as he offered silent thanks to the unknown naval architect who had designed the ship so some 2,500 tons of ballast could be easily carried with little expense, for that C–2 had but 1,000 tons of cargo aboard! Hardly enough to even put it down 2 feet in draft.

Pitching is not all pounding however, for a lot of it takes a ship right down into the deep blue and out again, carrying a few hundred tons of water along just to make things interesting. If the vessel happens to plunge into two successive waves, thousands of tons of water will roll over it and everything movable, along with a lot of things never considered in that category, will go over the side in a miniature Niagara Falls. The shock of diving into one of those deep water seas is enough to halt a ship dead in place, and when the impact is broad on the bow, a twisting, wrenching movement, is imparted that must be experienced to be understood. The damaging effect on a ship may not be as apparent as the indentations on the bottom incurred from pounding, but it is there all right, in the form of strained plating, strained piping, loosened rivets, cracks in the superstructure, and an enormous strain on the power plant.

How to minimize pitching

About the only way to ease a ship when pitching is to slow down as soon as possible. Turning about and running before heavy weather is often more dangerous than heading into it, for, by the time a ship has to heave to, the chances are the seas have reached a magnitude sufficient to render maneuvering hazardous.

A ship can pitch just as well when running before a sea as running into it, but when running before, the movement is not so violent and the ill effects are felt in yawing, racing of engines to an extent only slightly less than when bucking the waves, loss of speed, or, on rare occasions, taking a sea over the stern, this last occurrence being known as "pooping."

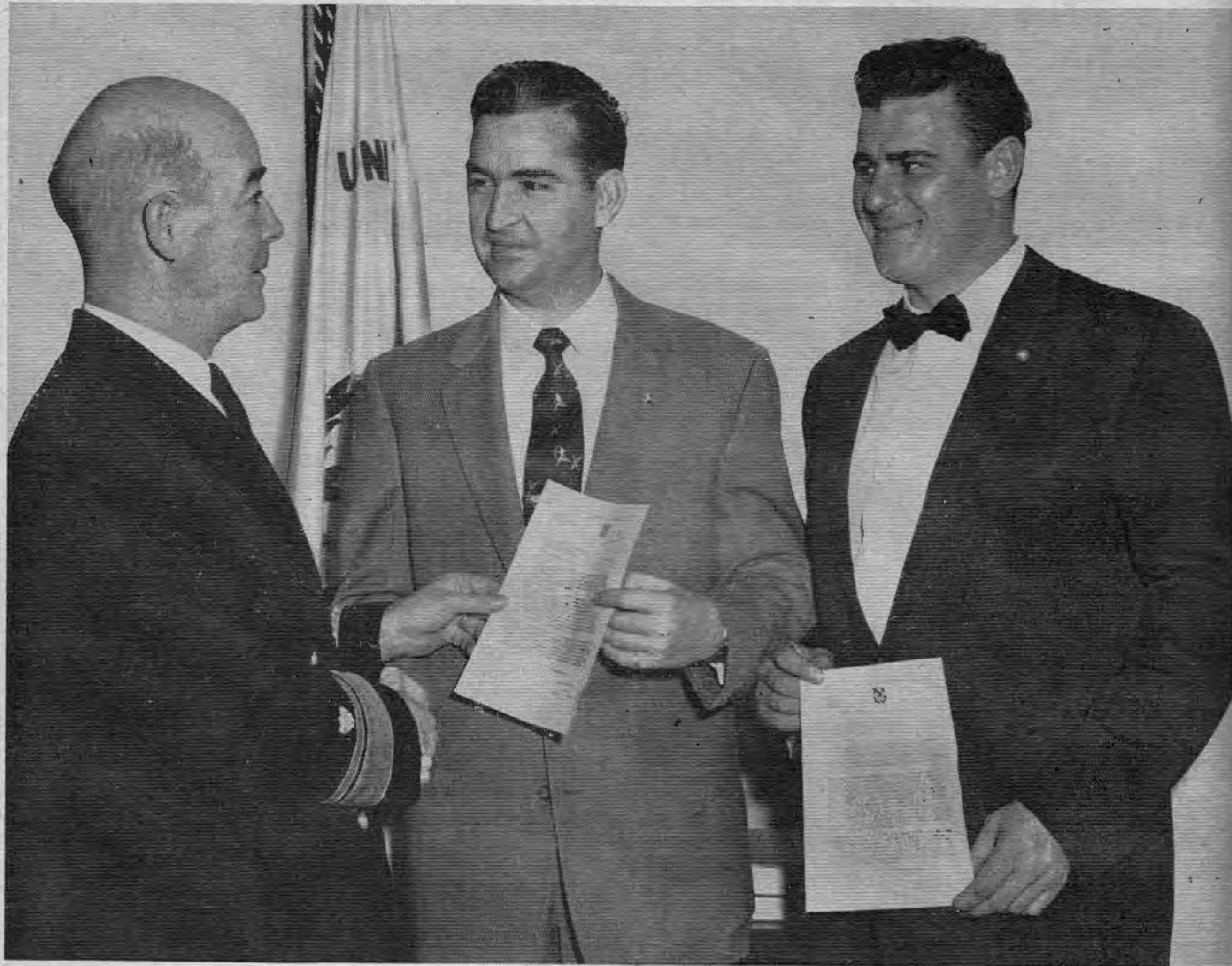
A stern sea is, however, an easy one to heave to in, for your present-day ship seldom encounters that old bugaboo fear of taking one over the tail. In the ancient, slab-sided ships there was, except for the counter stern, no lift aft, and once a sea overcame the slight resistance to boarding offered by the fantail, there was nothing to stop it. Your modern vessel, though, with a smooth, tapering run aft, upswept to a wide deck, is subjected to a lot of lifting power when a sea overtakes it. One can stand on the after deck of a modern ship and see all those forces in action; heavy seas rushing from aft with a crest high above the ship's deck, the lift of the ship long before the sea arrives, the dividing of the wave as it reaches the counter, and the backwash from the underwater form that throws two parts of the wave well out from the sides. Slowing down in a following sea increases the effect of the lift aft, for the period of encounter is decreased by permitting waves to pass much quicker, hence, in a heavy stern sea, a reduction of speed to bare steerageway generally tends to keep a ship quite dry and comfortable.

(Continued on page 73)

"THEY OUGHT TO GET ONE MORE BRIGHT IDEA LIKE BUILDING HULLS UPSIDE DOWN,-AND THEN DROP DEAD!"

(Courtesy Maritime Reporter)

COMMENDATION



Rear Admiral James A. Hirshfield, Assistant Commander, U. S. Coast Guard, presents the commendation to Mr. William K. MacWilliams and Mr. George L. Kellam.

Commendation from the U. S. Coast Guard for saving life is usually tendered to a seafarer for his action at sea in saving other seamen; however, occasionally someone ashore particularly distinguishes himself by a daring rescue of shipwrecked persons.

Such was the case last year when the ill-fated schooner *Levin J. Marvel* foundered and broke up on Chesapeake Bay. Only 13 of the 27 passengers and crew survived the wreck.

On February 21, 1956, Mr. William K. MacWilliams of North Beach, Md., and Mr. George L. Kellam, Jr., of Arlington, Va., were commended by the U. S. Coast Guard for exceptional bravery. The official commendation reads as follows:

The Coast Guard is pleased to commend you for exceptional bravery in rescuing survivors of the ill-fated schooner Levin J. Marvel *which foundered and broke up off North Beach, Maryland, on August 12, 1955. Your heroic efforts were directly responsible for saving the lives of six persons who had been washed from the wreck of the* Marvel.

Having been alerted by spectators on shore that signs of survivors had been noticed in a duckblind several hundred yards offshore, you volunteered to man a 14-foot open outboard motorboat and attempt to rescue such survivors.

By dint of your superior seamanship and unswerving fortitude, you, at great personal risk, were able to remove all six persons clinging to the duckblind and deliver them safely ashore through the crashing surf, where succor and aid were waiting.

Had not this valiant display of courage and nerve been forthcoming from yourselves at the moment when it was so sorely needed, it is almost certain that many or all of the six persons clinging desperately to the duckblind would have perished. Your achievement is worthy of the highest praise. As Commandant of the service which has every reason to respect and admire those who distinguish themselves in rescuing persons in peril on the sea, I take pride in tendering you the entire Coast Guard's "Well Done!"

Sincerely yours,

A. C. Richmond

A. C. RICHMOND
Vice Admiral, U. S. COAST GUARD
Commandant

nautical queries

Q. What information should be supplied to the bridge by the mate on the foc'sle head of a vessel when laying or picking up anchor?

A. The mate in charge on the foc'sle head when laying or picking up an anchor should keep the bridge informed of the amount of cable out, the direction in which it is tending, and the strain upon the cable. Anchoring in a tideway or with wind blowing, the bridge should be informed when the vessel has brought up or reached its maximum stress on the chain in anchoring. In heaving up the anchor, the bridge should be informed when the chain is up and down, when the anchor is aweigh, and when clear of the water.

Q. What precautions must be observed by a vessel anchored in an exposed roadstead?

A. A vessel anchored in an exposed roadstead, in addition to the usual anchor requirements of maintaining an efficient watch, should have a second anchor ready to let go if necessary and her machinery available for use at short notice.

Q. Where would you make an anchor buoy-rope fast?

A. Round the crown of the anchor.

Q. How is the length of chain required for a vessel determined?

A. The length of chain required for a vessel is determined from the tables in the "Rules for Building and Classing Steel Vessels" published by the American Bureau of Shipping, in accordance with the equipment tonnage and type of vessel as determined by those rules.

Q. Which end of an anchor chain connecting shackle is placed outboard and why?

A. Anchor chain shackles should be installed with the round end toward the hawse pipe so they will not get jammed in letting go the anchor.

Q. Why are studs used in an anchor chain?

A. Prevent fouling and increase strength of chain.

Q. How often should chronometers be cleaned?

A. Every 3 or 4 years by an experienced watch or instrument maker. A greater interval than 4 years between cleaning will ruin a chronometer.

Q. Where can one find the list of firefighting equipment to be carried on your vessel?

A. On the vessel's certificate of inspection.

Q. What would you do, if, while at sea, you broke the lowest screw on the back of the horizon mirror on the sextant?

A. If the screw breaks it is impossible to have the horizon glass properly adjusted; therefore, it is necessary to find the index error. To do this, hold the sextant vertically and look at the horizon; then move the tangent screw until the true and reflected horizons appear in a straight line in the horizon glass. The result will be the index error. The index error is subtracted when the error is on the arc and added when the error is off the arc.

Q. What are neap tides?

A. They are those which appear when the sun and moon are in quadrature and are smaller in range than spring tides.

Q. To "fake down" is to do what?

A. To coil a line so that each length of line overlaps the next one underneath, and hence the line is clear for running.

Q. What is the most immediate danger to a man falling overboard from a steamer?

A. The most immediate danger is that of being struck by the propeller. The first thought of a man falling overboard should be to swim outward from the ship.

Q. Can you describe a "wreck buoy"?

A. A wreck buoy is one painted with red and black horizontal stripes and marks a wreck.

Q. What is a rhumb line?

A. It is a line on the earth's surface which makes the same angle with all meridians.

Q. What type allotments are available to seamen?

A. 1. Allotments to grandparents, parents, wife, sister, or children. 2. To savings accounts maintained in his own name. 3. For the purchase of savings bonds.

Q. In what direction would your lifeboat be heading if the north star bore broad on your starboard quarter?

A. The lifeboat would be heading about southwest.

Q. Which type of rope is made from the henequin plant?

A. Sisal rope.

TRADITIONS OF THE SEA

The roll of American seafarers who have performed their duties in accordance with the highest traditions of the sea is long but never completed.

A group recently added to this honored list were Captain William H. Wight and his crew of the SS *American Miller*. They are as follows: Francis K. Kahle, Chief Mate; Charles B. Cummings, Jr., Third Mate; James J. Smith, Chief Assistant Engineer; John W. Kidney, Third Assistant Engineer; Lawrence Lumberg, Deck Utility; Paul Walker, A. B.; Chong F. Lee, A. B.; Fred Saarts, A. B.; and Melvin D. Saunders, A. B.

On November 16, 1955, while en route across the North Atlantic, the *Miller* received a request for assistance from the Italian SS *Dea Mazella*. The ship had caught fire and two crew members were seriously injured.

The *Miller* changed course and increased speed to rendezvous with the *Mazella*. At 0745 the next morning, despite gale winds and high seas, a lifeboat was lowered. Two hours later the lifeboat returned with the injured men.

On January 20, 1956, United States Lines presented distinguished service awards to Captain Wight and his men.

The citation read as follows:

> In appreciation of the masterly skill and seamanship displayed by Captain William H. Wight and the officers and the crew of the *American Miller;* of the fearlessness of Dr. Roldan in upholding the highest ideals of his profession; and their pride in the superb courage and resourcefulness of Chief Officer Kahle and the crew of the lifeboat, who, living up to the finest traditions of the sea, risked their lives to make this rescue possible.
>
> In recognition whereof, the UNITED STATES LINES COMPANY DISTINGUISHED SERVICE MEDAL is hereby awarded to Captain Wight, Chief Officer Kahle and each member of the lifeboat crew, and to Dr. Roldan.
>
> (Signed) John M. Franklin, *President, United States Lines.*

LESSONS FROM CASUALTIES

TAIL SHAFT ADRIFT

CAPTAIN William C. Ash, his officers and crew of the Clifton Steamship Corporation's SS *Boy*, did a magnificent job during December 1955 in repairing a serious machinery casualty in the middle of the North Atlantic during a storm. The casualty was most unusual in that the tail shaft of the Liberty became completely uncoupled from the last intermediate shaft, and was re-coupled by the crew, thus enabling the ship to continue her voyage under her own power.

The *Boy* was en route from Rotterdam to New York in ballast. Moderate weather prevailed from December 1, 1955, the day of departure, until December 6th when the North Atlantic began to kick up. For the next 10 days, the *Boy* encountered strong winds, rain, confused swells and a rough sea. As with all ships of this type with a reciprocating engine, difficulty was encountered due to the propeller racing as the ship pitched in heavy seas.

In addition to the automatic steam governor, there were standing orders by the Master and the Chief Engineer, that the engineroom watch should be particularly alert to prevent undue racing of the engine when the ship was pitching. These orders included authority for the engineer to slow down the engine speed whenever necessary to prevent racing, without first calling the bridge for permission.

UNUSUAL VIBRATION

On the morning of December 16th, the Chief Engineer, during his routine inspection of the shaft alley, noticed an unusual vibration in the vicinity of the after spring bearing. Assuming that the bearing was loose, he had the engineroom gang take up on the holding-down bolts. This seemed to eliminate some of the vibration, although the vessel was pitching heavily, and a certain amount of vibration still prevailed.

About 0415 hours the next morning, the oiler making his regular rounds noticed an unusual noise in the after spring bearing, but could not determine what the cause was due to the cover over the bearing. He hurried to the engineroom and reported this to the first assistant engineer. The first assistant immediately went aft, climbed down the shaft alley trunk and inspected the bearing. Limited visual inspection through the small inspection port in the cover seemed to indicate that the coupling, which was turning at about 50 r. p. m. seemed to be in proper alignment. However, he noticed four large nuts lying in the bilge. He rushed back to the engineroom, telephoned the Chief, told him of the four nuts, and slowed down the main engine.

SHAFT UNCOUPLED

As soon as the Chief arrived, both men went aft to the shaft alley and discovered that the tail shaft had become completely uncoupled from the intermediate. And this in the middle of the North Atlantic in December with a storm blowing! What to do? The decision that confronted the Master and Chief Engineer was whether to take the easy way out, send a distress message and call for a tow, or whether to take the hard way and try to repair the damage themselves under the worse possible conditions. Without hesitation the latter course was chosen, and then began a 33-hour period of frustration, danger, turmoil, and just plain sweat. During those hours every man in the crew toiled cheerfully and well and earned the unlimited praise and commendation of the skipper.

HERCULEAN TASK

First, the black gang removed the cover guard over the coupling using a burning torch and hack saw. After the guard was removed, the engineers attempted to block the forward tail shaft flange against the intermediate shaft flange in order to rebolt, bracing the blocks from the after peak bulkhead stiffeners. However, with the ship hove to and wallowing in the trough of a heavy sea with winds up to force 10, it proved to be a dismaying task. The after section, free to move fore and aft and to rotate as the seas struck the propeller blades, refused to stand still for this treatment. In the limited space at the after end of the shaft alley it was difficult for the men to do any work, much less to leash the whirling ponderous ram-rod before them.

Seeing the difficulties they were having below, and fearing that the hub end of the shaft in sliding aft might damage or even carry away the rudder post, the Master went topside and gathered together the deck force. Under the direction of the Master and chief mate the men struggled valiantly for the next 13 hours trying to block the shaft forward by working wooden blocks into the space between the propeller hub and the rudder post, lowering them from the fantail. This proved to be an impossible task as the heavy seas would turn the wheel, break the lines or throw out the blocks. Attempts were made for hours to get bights of wire down around the blades so that the thrashing wheel could be seized and held, long enough for the engineers to re-

Figure 1.—SS Boy on arriving in New York December 26, 1955, following unusual Atlantic crossing.

couple. Each time they succeeded in getting a bight around a blade, the wheel would turn and chop the wire (in the words of the Master) "like a shoelace."

SHAFT WEDGED

Meanwhile the engineers had devised a plan to use blocks of different sizes whereby they could catch the tail shaft flange when it was rammed into the most forward position against the intermediate flange, and immediately drive wedges to hold it. After several hours of the most discouraging efforts with sea water splashing in through the stern tube and always with the immediate danger of being struck or caught by the tail shaft, the engineers finally succeeded in seizing it in place. This was accomplished about 1800 hours or 13½ hours after beginning the task. Two flange holes were lined up close enough to get undersize bolts, which the second assistant had removed from one of the line shaft couplings, through and the nuts were set up with all speed.

Naturally enough, the two flanges were not properly aligned and then commenced another long period of struggling—this time with hand files and bolts which had been badly chewed up to get the first two bolts in place. Working against time and trying to avoid at any cost the parting of the coupling again, the engineers finally had two regular size bolts in and set up. The two undersize bolts were then removed and returned to the line shaft coupling, and two of the original tail shaft coupling bolts were worked into place and set up.

After more struggling with files and hammers the remaining two bolts were worked through and secured. The engineers now had four of the six coupling holes bolted all the way up and the other two fairly tight.

SLOW AHEAD

It was deemed safe to try to turn over the main engine, some 33 hours after the arduous task began. The engine was operated at dead slow for several hours, while most of the weary crew got some sleep, and then stopped. At this time the engineers were able to set up on the coupling nuts a little more. Starting the engine again and very slowly increasing the revolutions, as the weather had now begun to moderate, the crew of the good ship *Boy* brought her back on course and resumed their voyage homeward.

On the third day after the casualty, it was necessary to stop for an hour as the engineers, checking the coupling at frequent intervals, found one of the nuts had vibrated off. This time it was a simple matter to reset the nut, and then were able to fully set up on the other slack bolt—the coupling was now tightly secured.

Seemingly as a reward for the terrific endeavors of the crew, the weather continued to moderate. The *Boy* continued her voyage and docked at Hoboken on December 26.

DRYDOCK

In drydock, it was found necessary to renew the tail shaft and wheel. The wheel had been badly banged up striking the rudder post during the critical period. It must certainly have been with mixed feelings that the engineers watched the tail shaft being pulled and carted away, as most of them had been as close to danger working on that shaft as any seamen would ever want to be. The officers and crew of the *Boy* can be justly proud of their admirable performance of duty, without thought of self, in the face of danger, for the good of their ship. It is a job like this which reminds the entire marine industry of the true worth and ingenuity of American seamen when they are called upon to meet an emergency.

While many Liberty ships have suffered the loss of a propeller and a broken tail shaft in the years since these war-time ships were built, there are few, if any, reports of a coupling parting at sea. Certainly a case of the tail shaft being recoupled by the crew during a storm at sea is rare indeed.

Precautions against a casualty of this type, such as welding the nuts, using lock washers or cotter pins, or drilling and wiring the nuts could be considered. However, since this type of failure is so rare, the conclusion must be made that well-machined bolts and nuts in shaft couplings, properly set up, do not need such extra precautions. One measure with which no seaman or operator could argue would be to insure that the shaft couplings are inspected by shipboard personnel at frequent intervals, especially during heavy weather when a failure would be most apt to occur.

The names of the members of the black gang who fought to recouple the tail shaft so valiantly, are as follows:

Everett W. Brown, Chief Engineer;
Roland L. Brittingham, First Assistant Engineer;
Gerard J. Werner, Second Assistant Engineer;
Fay L. Cawthon, Third Assistant Engineer;
Tripola Young, Deck Engineer;
Francis W. Gura, Oiler;
Esteban Sandoval, Oiler;
Percy Sandoval, Oiler;
Percy Cruikshank, Jr., Oiler;
George Caragianis, F/WT;
Dimitrios J. Anestis, F/WT;
Joseph R. Vescera, F/WT;
Rural Ball, Wiper;
Leroy Wilson, Wiper.

The Coast Guard congratulates you and your shipmates on deck for a job *well done.*

INVISIBLE DEATH

Whenever death by carbon monoxide poisoning is mentioned one usually thinks of a closed garage and a defective automobile exhaust pipe. This association is all right for landbound persons but not for those who travel on the water—especially yachtsmen.

A common misconception of how death is caused by carbon monoxide is the belief that there is insufficient oxygen in the atmosphere. Such is not the case. Carbon monoxide is a poisonous gas and can kill even though a person is breathing sufficient oxygen at the time.

What happens is that the carbon monoxide combines with the hemoglobin of the blood and prevents it from carrying oxygen to the tissues. It is this lack of oxygen in the tissues that causes headache, unconsciousness, and finally death.

Carbon monoxide (CO) is a gas composed of carbon and oxygen. It is formed by the incomplete combustion of such materials as oil, wood, or gas, and is found in the exhaust gases of all internal combustion engines.

Consequently, deaths from carbon monoxide are not confined to shoreside occupations but can occur anywhere an internal combustion engine is used. Since such engines are used in many yachts, it follows that deaths can occur even though yachting is known as an out-of-door, fresh-air sport.

TWO SIMILAR ACCIDENTS

Two fatal accidents last summer vividly demonstrate what can happen when a vessel's exhaust system is defective even though there is a fresh breeze blowing topside. The accidents were very similar but occurred at opposite corners of the United States—one off the Florida Keys and the other on Puget Sound. In both cases 30-foot cabin cruisers were involved, each propelled by a gasoline engine.

In the first case the yacht departed the Keys early in the morning bound for the Bahama Islands. On board were the owner, his 14-year-old son, and a friend. During the first part of the trip, the exhaust pipe cracked between the manifold and the muffler. The engine was located beneath the cabin deck, which meant that the escaping exhaust fumes filled the cabin. The owner made emergency repairs by lashing a strip of asbestos around the broken section. When the repairs were completed, he started the engine. While the escaping fumes were not as noticeable as before there was no question but that some exhaust gases were still entering the cabin. However, the owner decided that as long as the cabin hatchway was open, it would be safe to continue on to the destination.

HATCHWAY OPEN

While the boat was hove to for repairs, it lay in a trough and the son, who had been on the verge of being seasick, became violently ill. After the boat got underway he went into the cabin to lie down. His father did not worry about the exhaust fumes since the hatch was open. A short time later the father noticed the boy had fallen to the deck. He hurried below and lifted him back onto the bunk. He was conscious and retching at the time. Later the father again noticed him on the deck and went below to help him. This time he was horrified to discover that the boy was unconscious. He commenced artificial respiration immediately and continued it for an hour—without success.

On arrival in the Bahamas an autopsy was performed and it was learned that the cause of death was *carbon monoxide poisoning.*

In the other case, the yacht departed Seattle for a weekend of pleasure cruising on Pudget Sound. On board were the owner and two friends. The first day out was uneventful, the yacht cruising leisurely amidst the various islets. The following day the yacht cruised in the morning and anchored early in the afternoon. It had turned cold about noon and from then until anchoring the cabin hatch was kept closed. After anchoring, all hands went below, the owner going to the lower forward cabin to rest. The guests noticed the cabin was stuffy and opened the hatch and windows in the after upper part of the cabin.

A short time later the owner became ill. The guests got the yacht underway and proceeded to the nearest port for medical aid. By the time they arrived, the owner was unconscious. Although the fire department administered artificial respiration, they were unable to revive him and he was pronounced dead—*carbon monoxide poisoning.*

EXHAUST PIPE DETERIORATED

An investigation of the machinery space after the accident revealed that the section of exhaust pipe beneath the cabin floor had deteriorated and there was a large hole in it. (*See Figure 1.*) A coil of copper tubing in which cooling water circulated was wrapped around the exhaust pipe. The close turns of the tubing hid the pipe from visual inspection and presumably muffled the sound of the escaping exhaust so there was no way to detect the leak without removing the coil.

The deceased was a respected, active yachtsman in that area. Ironically, he had a reputation for being one of the most safety-minded boat operators. He kept the bilges clean, always ventilated before starting the engine, and kept the machinery in top condition—except for that section of the exhaust pipe which was hidden to view.

LESSONS TO BE LEARNED

There are several lessons to be learned from these two fatalities.

First—in both cases the cabins were open to the atmosphere but death still resulted. This shows that no leak in the exhaust system can be tolerated, because a potentially fatal concentration of carbon monoxide can accumulate even though the space is subject to natural ventilation.

Second—whenever the exhaust system is in need of repair, a temporary repair should be made only as a last alternative. If made, such repairs should be highly suspect, and all hands should remain on the open deck when the vessel is under way.

Third—the exhaust system should be inspected regularly so that any wasting away of the lines can be discovered before an actual failure occurs. Where the exhaust pipe is hidden by other pieces of machinery or, as in this case, by tubing, particular care should be taken to see that every section of the tube is examined.

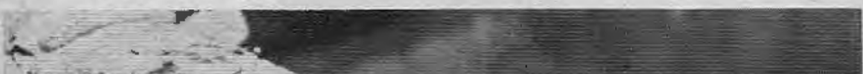


Figure 1.—Section of exhaust line showing hole and coil of tubing which hid it from view.

CHECK BEFORE YOU DEPEND!

By *Commander R. T. A. McKenzie, USCG*

It may be true that "half a loaf is better than none", but the nautical equivalent of having onboard equipment which will not operate can lead to serious consequences. If you place confidence in, and depend on one of your navigation instruments, only to find that it is inoperative, you are in a worse situation than if you did not have it—did not depend on it—and as a result, did not place yourself in a position where you urgently needed it!

Consider, for example, the recent voyage of a 15-foot motorboat which, with two men aboard, departed a small East coast inlet one November morning for a few hours' ocean fishing. Although the boat was to remain well within sight of land, the operator took a compass along as a safety measure. Had the compass not been aboard, one may now speculate that the operator would have been more alert as to his distance from shore and paid more attention to the weather and visibility. Had he done so, this account would not have been written.

Although weather conditions were favorable with a bright sky and good visibility, there was an offshore wind blowing about 15 knots. The force of the wind caused the boat to drift considerably but the fact was not noticed by the occupants. During the late afternoon, haze set in, the shoreline disappeared and they decided to get under way for home. The motor was started and with aid of the compass, the boat was headed for shore. It was not until then that they realized the compass was useless—the card was stuck. They tried steering on a variety of courses in an attempt to find the beach but with no luck. Night fell.

At 8 p. m. the motor stopped for lack of fuel. The day's fishing excursion was suddenly transformed into a dangerous venture—no compass, no lights, no fuel, inadequate food and clothing, and the boat being blown out to sea.

When the fishing party failed to return by dark, it was reported to the Coast Guard. At 8:30 p. m. a search was commenced that was to last until 2:30 p. m. the next day. While it was not a large-scale search, due to the relatively small area that the boat could be in, even so, 2 picket boats, 2 small cutters, 1 large cutter, 2 helicopters, 2 Albatross (a twin-engined amphibian), and a Martin PBM patrol seaplane—10 units in all—participated. Finally, after many hours, one of the aircraft spotted the tiny boat bobbing amidst the North Atlantic swells—*10 miles out to sea and 16 miles south of the inlet.* The aircraft radioed the position to a small cutter which proceeded to the scene, took the occupants aboard, and towed the boat to safety.

In this case, the compass which failed was not required equipment; however, it *was* aboard, and by virtue of its presence, the operator was lulled into a false sense of security and ventured out so far that need for a compass became a necessity. It failed—and because of its failure two lives were placed in jeopardy, (not to mention the several hundred Coast Guardsmen who participated, and the many thousands of dollars worth of equipment involved in the search.)

The failure of equipment, whether it is required by law or not, can lead to the most serious of difficulties, even to the loss of life and property. Check and recheck your gear before circumstances force you to depend upon it. Always remember—the traditional "ounce of prevention" is as useful afloat as ashore.

HOW THEY PERFORM

(*Continued from page 67*)

Now we come to the last of the discussion on pitching; how does a shipmaster go about controlling it. That's an easy one, for there isn't really very much he can do other than reduce speed. Changing course helps, but if the pitching is severe, the chances are that a radical alteration of course will put the ship in a position to roll heavily, and as pitching is the lesser of the two evils, most Captains prefer to head into the wind and ease the vessel by reducing speed. Sometimes this results in being hove to, and while the ship will ride easily, the course isn't always the one desired.

There is no doubt that the best way to ease pitching is to load the ship in such a manner that the movement will be quick, snappy, with smart recovery. It's a good idea, and follows along the best accepted theories, but we can't always do it.

Combinations of pitching and rolling, usually called "laboring," are handled fundamentally the same as rolling or pitching, depending on which movement appears to be the most dangerous or severe, with reductions of speed, alterations of course, use of tanks to increase or decrease roll period, and, when all else fails, heaving to.

MISCELLANEOUS

Ice hazard

A somewhat unusual hazard encountered in the high latitudes is ice, and by ice it is not intended to mean bergs, growlers, drift ice, such as is reported by the Coast Guard's very efficient patrols, but rather ice coating of a ship as a result of heavy spray during periods when the temperature is well below freezing. It is not a common occurrence and rarely offers any problems to large passenger ships, but your cargo vessel can undergo some serious upsets in stability if it acquires several hundred tons of ice on deck. When loading a ship for a westbound passage in the North Atlantic in winter, the author is in the habit of allowing for a surface load of ice to the amount of some 700 tons. He didn't always do so, but had to learn the hard way when his ship acquired some thousand tons or so of ice during a severe gale when the temperature was a freezing 12°. Fortunately, the event occurred when there was a comfortable excess of GM, but had that not been so, the sudden addition of weight on the upper decks would have induced a list that could not have been counteracted. A few winters later the same thing reoccurred, but to a lesser degree, and proved the worth of making allowances for peculiar emergencies.

Frozen ballast tanks

Along with the subject of ice it is interesting to know that ballast tanks can freeze. It happened once during the bitter winter of 1947 in Germany when certain deep tanks had been filled for the long passage home. There was plenty of time for the ice to thaw all right, but when large lumps began to swash about due to bad weather and thawing, a lot of breaths were held until the ice melted completely.

Another cold-weather problem frequently encountered in the high latitudes concerns the chilling of fuel oil in double bottoms. Many C–2's have comparatively scanty heating coils, and, when pumping the oil can be like tar once the level falls below the coils. However, thanks to deep tanks with a center of gravity well above that of the double bottoms, it is possible to run a lot of hot oil in the cold lower tanks, allow a short time for it to thaw the congealed oil, and pump as much out as possible before the residue freezes again. It works well, so well in fact that the idea has been used to keep cargo oil carried in unheated cargo deep tanks from congealing by radiation of hot fuel oil continually circulated through the double bottoms immediately beneath the tanks.

Of all the cold-weather difficulties, albeit one that has nothing to do with the seakeeping qualities of a ship, is heating quarters when the heating system consists of ducts carrying preheated air. Theoretically, the heaters should warm air sufficiently for normal temperatures, and they do, except when there is a strong, freezing wind, blowing with considerable force straight into the intake screens. Then, if the blower is speeded up in an effort to circulate more air, the heaters do not have an opportunity to do their job, and if the blowers are slowed down and the heaters allowed to work on the air passing into the ducts, insufficient warm air gets about the ship.

On one ship this problem has been solved by using something installed by a designer but never contemplated as being of value to heat a ship. In this case, the fan room happened to be located just aft of the engine space on the after end of the boat deck, so, when freezing winds from aft blow directly into the intake screen, said screen is covered and the icy air shut out entirely. Naturally air is required for the ventilation system, so the ship's personnel long ago cut a small opening between the fan room and engineroom, so, when the ship cannot be kept warm through the action of air heaters, the air is taken from the engineroom and even in the bitterest weather most sections of the ship remain warm and snug. When the temperature rises again to normal, the opening in the bulkhead is blanked off, and the normal heating system restored to operation.

Again, we have the use of a ship as designed, but with a few ramifications introduced by a ship's company.

Now one last subject.

MANEUVERING

There is little doubt that American ships are famed throughout the world for their maneuverability, and justifiably so too. After all, the praise comes from those who should know—the pilots, docking masters, towboat men, and others, who handle ships of all nationalities under every condition—but it is up to the shipmaster himself to analyze the reasons therefor.

One of the most noteworthy qualities on modern American ships is rudder power, and it is a characteristic to be found on nearly all of them. Add to that, an efficient steering engine and wheel that permit a man to steer easily without wearing himself out muleing a heavy wheel thither and yon, and the secret is revealed. Yet there is more to the maneuvering of our ships than mere rudder power—there is the excellence of modern turbines which, when properly handled, can be shifted from ahead to astern and back again nearly as fast as a reciprocating engine. Of course, the shipmaster has to watch out for things and make sure his engines are not abused by those charged with handling ships in harbors, and some interesting observations have been made with that in view.

"TAKE PARTICULAR NOTICE, JUST SO I DON'T GET BLAMED FOR THAT LATER ON!"

(Courtesy Maritime Reporter)

For instance, our C–2, C–3, Victory, and so on have excellent backing power, but prolonged periods of full astern quickly exhaust a good head of steam as well as overheat condensers. Sixty seconds full astern is about all they can take without slowing down, and just so long as one knows this idiosyncrasy everything can be kept well under control.

It is not just the handling that makes a good ship, or just the design, or just the construction. It is a combination of all three activities, each dependent on the other. Without good design, desirable qualities will not be built into a ship, and if such qualities are not present, the best shipmaster in the world can do only so much in the handling. The maneuvering of ships is that basic.

A SUGGESTION

All of these reports on performance of ships have been of necessity, very brief. This is regretted, but the author believes every one of the stories should have been reported long ago and studied by those interested in ship construction. Unfortunately, it has not been practical so to do, for there exists, as far as this person knows, no central organization within the maritime industry that solicits information of the nature just reported, and therefore no one to whom such data might be sent with any assurance of its being studied and acted upon if deemed valuable. This is, without doubt, a weakness in the world of ship design and construction, yet it is one that could be easily remedied.

A central organization, or office, linked with the maritime industry, which would send out requests to seamen for studies to be undertaken concerning specified subjects, as well as receive suggestions, recommendations, praise, and even criticism, and pass it along to interested parties, truly, such an office would be of inestimable value to future ship design and construction.

Many shipmasters and marine engineers would be more than willing to devote some of their spare moments to anything they might feel would be of value if incorporated in the design of the ships they might be sailing in the future, for it is a simple fact of human nature that everyone wants to feel he has accomplished something which, be it in ever so small a way, he can see put to use in a manner that will benefit the future.

After all, an ancient Chinese soldier explained the concept 2,000 years ago when he said:

Within the stifling masses are lost many good brains who can find none to listen to them.

CASUALTY RETURNS

The Liverpool Underwriters' Association has just published worldwide casualty statistics for December 1955. The report shows that 753 vessels of 500 tons gross and over met with casualties during the month, compared with 786 in December, 1954, 664 in December, 1953, and 766 in December, 1952.

Of these casualties, 169 were classified as having damage to machinery, shafts and propellers; 135 as collisions; 123 as being weather-damaged; 100 as strandings; 29 as damaged by fires and explosions; and 1 missing, leaving 196 "other casualties" to make up the total of the month. Of this total, 8 were total losses and 745 partial losses. The total losses for the month consisted of 2 motor-vessels and 6 steamers, aggregating 14,259 tons gross, compared with 5 motor-vessels and 7 steamers, of 27,796 tons gross, in December, 1954, and 3 motor-vessels and six steamers, of 32,644 tons gross, in December, 1953.

During the whole of 1955, there were 7,575 casualties (105 total losses and 7,470 partial losses), compared with 7,013 in 1954, 7,269 in 1953, and 7,776 in 1952. In addition, vessels mined during the year accounted for five casualties.

INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1948

The Government of the United Kingdom has advised this Country that acting as the depository nation, it has received notification of acceptance from Czechoslovakia of the *International Regulations for Preventing Collisions at Sea*, 1948. Notification was received on November 9, 1955.

This Country was also advised that the Government of Greece has made reference to Rule 13 (b) of the *International Regulations for Preventing Collisions at Sea*, 1948 and has informed the depository nation that the submarines of the Royal Hellenic Navy, in view of their special construction and special purpose, would not comply with the requirements of Rule 2 (a) (i) when such compliance would hinder them in the fulfillment of their duties. When, however, such vessels do comply with Rule 2 (a) (i), they shall be exempt from carrying the second white light provided for in Rule 2 (a) (ii).

The Greek Government stated that the above-mentioned arrangement went into effect on October 1, 1955.

APPENDIX

AMENDMENTS TO REGULATIONS

[EDITOR'S NOTE.—The material contained herein has been condensed due to space limitations. Copies of the Federal Registers containing the material referred to may be obtained from the Superintendent of Documents, Washington 25, D. C.]

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter I—Coast Guard, Department of the Treasury

Subchapter G—Navigation Requirements for Certain Inland Waters

[CGFR 55-48]

PART 82—BOUNDARY LINES OF INLAND WATERS

EDITORIAL CHANGE REGARDING PASS CAVALLO LIGHTED WHISTLE BUOY 1 ON THE GULF COAST

The Pass Cavallo Lighted Whistle Buoy 1 is used as a reference point in the description of the line dividing the inland waters from the high seas between the Brazos River and the Rio Grande, Texas (33 CFR 82.116). During 1955 this buoy was moved because the channel shifted. Therefore, this editorial amendment to 33 CFR 82.116 substitutes for this buoy a reference point designating the place where the Pass Cavallo Lighted Whistle Buoy 1 was formerly located so that the line established by regulations published in the FEDERAL REGISTER December 8, 1953 (18 F. R. 7894), will not be affected.

§ 82.116 *Brazos River, Tex., to the Rio Grande, Tex.* A line drawn from Freeport Entrance Lighted Bell Buoy 1 to a point 4,350 yards, 118° true, from Matagorda Lighthouse; thence to Aransas Pass Lighted Whistle Buoy 1A; thence to a position 10½ miles, 90° true, from the north end of Lopeno Island (Lat. 27°00.1′ N., Long. 97°15.5′ W.); thence to Brazos Santiago Entrance Lighted Whistle Buoy 1. [Federal Register of Thursday Nov. 17, 1955]

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

Subchapter O—Regulations Applicable To Certain Vessels During Emergency

[CGFR 55-49]

PART 154—WAIVERS OF NAVIGATION AND VESSEL INSPECTION LAWS AND REGULATIONS

PERMITS FOR COMMERCIAL VESSELS HANDLING EXPLOSIVES AT MILITARY INSTALLATIONS

The Secretary of Defense in a letter dated October 19, 1955, to the Secretary of the Treasury requested a general waiver of quantitative restrictions for commercial vessels loading explosives at the Department of Defense waterfront installations. Section 1 of the act of December 27, 1950 (64 Stat. 1120; 46 U. S. C., note preceding 1), states in part as follows:

That the head of each department or agency responsible for the administration of the navigation and vessel-inspection laws is directed to waive compliance with such laws upon the request of the Secretary of Defense to the extent deemed necessary in the interest of national defense by the Secretary of Defense. * * *

§ 154.15 *Permits for commercial vessels handling explosives at military installations.* Pursuant to the request of the Secretary of Defense in a letter dated October 19, 1955, made under the provisions of section 1 of the act of December 27, 1950 (64 Stat. 1120; 46 U. S. C., note prec. 1), I hereby waive in the interest of national defense compliance with the provisions of R. S. 4472, as amended (46 U. S. C. 170), and the regulations promulgated thereunder in Part 146 of this chapter to the extent that no quantitative restrictions, based on considerations of isolation and remoteness, shall be required by the Coast Guard for commercial vessels loading or unloading explosives at the Department of Defense waterfront installations. This waiver shall not relieve a commercial vessel loading or unloading explosives at the Department of Defense waterfront installations from the requirement of securing a permit from the Coast Guard for such operations with respect to quantitative or Coast Guard on the basis of each vessel's ability to meet prescribed stowage and handling requirements.

(Federal Register of Wednesday, Nov. 23, 1955)

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter I—Coast Guard, Department of the Treasury

Subchapter N—Artificial Islands and Fixed Structures on the Outer Continental Shelf

[CGFR 56-4]

SAFETY EQUIPMENT AND OTHER MATTERS RELATING TO PROMOTION OF SAFETY OF LIFE AND PROPERTY

A notice regarding proposed regulations governing safety equipment and other matters relating to promotion of safety of life and property on artificial islands and fixed structures on the outer continental shelf was published in the FEDERAL REGISTER dated December 22, 1955 (20 F. R. 9862–9867). These requirements were considered by the Merchant Marine Council and a public hearing was held on January 23, 1956, at Washington, D. C.

(Federal Register of Thursday, February 9, 1956)

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter I—Coast Guard, Department of the Treasury

Subchapter B—Military Personnel

[CGFR 55-54]

PART 33—APPOINTMENTS OF CIVILIANS AS COMMISSIONED OFFICERS, CHIEF WARRANT OFFICERS, AND WARRANT OFFICERS

PHYSICAL STANDARDS

By virtue of the authority vested in me by the Secretary of the Treasury in Coast Guard General Order No. 1, the following amendments are hereby prescribed and shall become effective upon publication in the FEDERAL REGISTER.

SUBPART 33.05—APPOINTMENTS OF LICENSED OFFICERS OF THE UNITED STATES MERCHANT MARINE AS COMMISSIONED OFFICERS, CHIEF WARRANT OFFICERS, AND WARRANT OFFICERS

Section 33.05-27 *Physical standards* is canceled. (The revised text is transferred to a new Subpart 33.10.)

Part 33 is amended by adding a new Subpart 33.10 reading as follows:

SURPART 33.10—PHYSICAL STANDARDS

(Federal Register of Wednesday, February 22, 1956)

EQUIPMENT APPROVED BY THE COMMANDANT

[EDITOR'S NOTE.—Due to space limitations, it is not possible to publish the documents regarding approvals and terminations of approvals of equipment published in the FEDERAL REGISTER dated February 28, 1956 (CGFR 56-7)-(CGFR 56-8). Copies of these documents may be obtained from the Superintendent of Documents, Washington 25, D. C.

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