

PROCEEDINGS

OF THE MARINE SAFETY COUNCIL



DEPARTMENT OF TRANSPORTATION

UNITED STATES COAST GUARD

Steel Vendor Stranding . . .

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CONTENTS

FEATURES

The Loss of the <i>Steel Vendor</i>	Page 79
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DEPARTMENTS

Safety as Others See It	84
Lessons from Casualties	85
Marine Safety Council Membership	86
Coast Guard Rulemaking	87
Amendments to Regulations	89

COVERS

Photographs of the stranded SS *Steel Vendor* during evacuation of her crew appear on our front and back covers this issue. Having been adrift without power for two days, the ship found herself some 90 miles south of her estimated position, and she was driven onto the Loaita Bank shoal by heavy seas and strong winds. The crew members were evacuated by helicopters from the British Aircraft Carrier HMS *Eagle*. Only one person was injured.

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PROCEEDINGS

OF THE

MARINE SAFETY COUNCIL

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THE LOSS OF THE STEEL VENDOR

The Grounding

ON OCTOBER 5, 1971, the fully loaded cargo ship *SS Steel Vendor* lost all propulsive power while underway in the South China Sea. By October 7, having been unable to restore power to her engines, she found herself in severe difficulty. She was adrift in heavy seas and hurricane force winds; and, due to weather conditions and her lack of LORAN equipment, she had been unable to get a navigational fix for 4 days. At about 11:15 a.m. (all times are given in zone description -8) the sun broke hazily through the overcast for the first time since the vessel departed Manila, Republic of the Philippines. The third mate on watch woke the second mate, who was serving as navigator, and informed him of this break in the weather. These two men and the other third mate went immediately to the wing of the bridge to take navigational observations of the sun. While

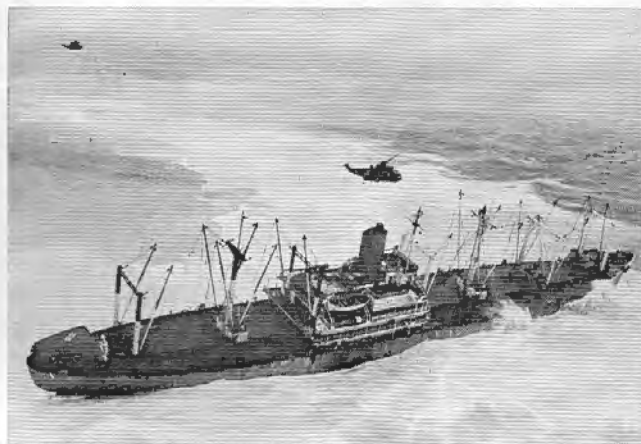
these observations were taking place, one of the third mates noticed white water breaking on the horizon on their port side. This area appeared to be a reef with what was later identified as a small island lying beyond. By reviewing the charts of the area and crossing the sunline position with the locations of various possible islands, the deck officers were able to establish an estimated position. This new position was approximately 90 miles south of the dead reckoning position of 8:00 that morning!

The *Steel Vendor's* master, having been informed of the situation, went to the bridge immediately. He observed the reef in the distance and confirmed the frightening fact that the vessel was being set inexorably toward the reef by the strong winds and seas on the starboard beam. A distress message was sent out and was responded to by three vessels, the Tug *Buckeye*, the HMS *Eagle*, and the SS

Green Port. The tug had already been dispatched from Saigon by the *Steel Vendor's* Manila agents to assist the disabled ship, and the HMS *Eagle* stated that it would come to the *Steel Vendor's* aid. The *Green Port* was therefore released to continue her voyage.

Though help was on the way, the crew of the *Steel Vendor* began to prepare to abandon ship in the event that help did not arrive in time. The chief engineer was told of the impending danger, and work to restore engine power was accelerated. Meanwhile, the crew readied emergency gear for abandoning ship.

The master calculated the drift of his vessel. He estimated that the ship would be in dire danger of grounding by about 2 p.m. At about 1 p.m., he directed his chief officer to the fore-castle to prepare both anchors for letting go. At 1:45 the port anchor was let out easily on the handbrake since



At about 2:36 p.m. on October 7, 1971, the *SS Steel Vendor*, at the mercy of the wind and the sea, slammed into the Loaita Bank Reef in the South China Sea. The photographs above show the ship grounded during evacuation of her crew by helicopter. Heavy waves pounded the vessel's starboard side, walking her farther onto the reef.

there was no power to operate the windlass. After about five shots the brake failed, and the chain ran out to the bitter end. The anchor riding pawl was set and the anchor chain was observed to be tending straight up and down. At about 2:20, the anchor touched bottom and started to hold the vessel even though the wind and seas caused the heading of the vessel to remain in a southerly direction at right angles to the direction the anchor chain was now tending. The reef appeared to be just a quarter mile off on the port beam. At about 2:30 the ship shuddered, indicating that the anchor had broken free of the bottom and was dragging. The vessel continued to drift toward the reef. Anticipating that the chief engineer would have the main engine ready in time to maneuver the vessel away from the reef and out of danger, the master never ordered the starboard anchor let go. The master felt that if two anchors were out, his chances of successfully maneuvering the ship away from the reef would be diminished due to the time required to weigh both anchors, and the possibility of the chains fouling.

At about 2:36 p.m. a heavy jolt rocked the crewmen aboard the *Steel Vendor*. The ship had contacted the Loaita Bank Reef. The chief engineer had just told the bridge that he had 20 inches of vacuum and that he could make about 25 r.p.m. on the main engine; but by this time the vessel was slamming into the reef with each roll. It was apparent that No. 1 double bottom tank had been holed as the ship first struck the reef, since fuel oil and water were seen gushing from the vessel. On deck, the port lifeboat was lowered to the boat deck out of concern that the vessel might take a list which would prevent the gravity davits from functioning. The inflated liferaft was lowered to the water on the port side without difficulty, as the ship provided a lee to the crashing breakers.

When the master received word from the engineroom that the main engine was ready for limited turns,

THE SS STEEL VENDOR

The *SS Steel Vendor* was a C-3 Freighter built in 1944. Her displacement was 7,752 gross tons, and she had a length of 468.5 feet and breadth of 69.6 feet. She had steam turbine propulsion with a horsepower of 8,500. Prior to her stranding, she had last undergone a U.S. Coast Guard Biennial Inspection in Portland, Oreg., on March 12, 1971, and had been inspected by the American Bureau of Shipping on July 21, 1971, at Mobile, Ala. This latter inspection was a special periodical survey of machinery. She departed Houston for the Far East on July 26, 1971.

The *Steel Vendor* was properly manned by Coast Guard licensed and/or documented personnel.

the vessel was already grounding hard on the reef. Double bottom tanks Nos. 2 and 3 also had been holed now and water and oil were spewing from their respective vents. The vessel seemed to be walking farther onto the reef with sharp snap rolls with each wave. At about 2:45 p.m. the master was told that the fuel oil settling tanks had been ruptured and water had contaminated the fuel oil system, putting out the fires in the boiler. Water was also seen gushing from the sounding tubes for No. 4 double bottom tanks. The master ordered the engineroom evacuated.

Evacuation

It was about 2:35 p.m. when a helicopter from the British Aircraft Carrier, *HMS Eagle* appeared over the *Steel Vendor*, hovered overhead, and lowered a man to the deck. The stricken ship's master was asked whether he desired to have his crew evacuated to the aircraft carrier. After an exchange of communications with the commanding officer of the *HMS Eagle* it was decided to commence with evacuation of the crew to the *HMS Eagle* and thence to the U.S. Naval Base at Subic Bay, Philippines. The ferrying of the *Steel Vendor*'s crew via helicopter to the *HMS Eagle* was begun at about 4:45 p.m.

At the order for evacuation of the engineroom, the chief engineer had gathered the engineroom logs and records and taken them to his room, placing them in a satchel bag along

with his personal papers. During the final minutes of the evacuation he started to go below from the ship's chartroom to his cabin to retrieve this satchel. As he started down the stairway, however, the ship took a snaproll and he lost his footing and fell to the bottom of the stairwell. The four remaining officers aboard the *Steel Vendor* put the chief engineer in a litter and hoisted him to the hovering helicopter. The master departed his vessel at 5:45 p.m., the last man to do so. Just prior to his departure, the vessel was noted to be listing about 15° to starboard. It appeared that the ship was starting to hog just forward of the deckhouse in the vicinity of No. 3 hold. Some fractures were noted inside the deckhouse, in the hull, and in the strake below the shear strake on the port side. The emergency generator was still running, supplying emergency power, when the ship was abandoned.

The *HMS Eagle* arrived off Subic Bay on October 8, 1971, and transferred the survivors of the *Steel Vendor* grounding ashore. The chief engineer, who had suffered some small cuts and a trauma to his left kidney, was the only casualty.

The Coast Guard Marine Board of Investigation convened to investigate the loss of the *Steel Vendor* concluded that the casualty resulted from the "failure of one or more tubes in both the port and starboard boilers, which resulted in the *SS Steel Vendor* drift-

ing dead in the water from about 0812, on October 5, 1971, until about 1436, on October 7, 1971, at which time the vessel grounded on Loaita Bank Reef in the South China Sea." The National Transportation Safety Board (NTSB), under its statutory duty to determine the cause of the casualty, determined that "the probable cause of the loss of the SS *Steel Vendor* was the crew's inability to prevent the ship from being driven into a region of dangerous reefs."

The Engineeroom Difficulties

A series of incidents beset the engineeroom crew of the *Steel Vendor* and led to the inability of the vessel to maneuver out of danger. Most of these incidents affected the boilers. The ship began her voyage from Houston to "one or more Far East ports via one or more Indian Ocean ports and back to a final port of discharge in Continental United States" on July 26, 1971. The ship's boilers performed without any reported malfunction until September 4, the day before arrival in Rangoon, the first scheduled port for cargo discharge. That day the port boiler economizer ruptured. The ship's engineering crew made what the NTSB termed "an error" by failing to shut off the fires in the starboard boiler as the water level dropped out of sight at this time. Still, the starboard boiler continued to operate satisfactorily until September 30, when it became necessary to plug one leaking tube. Repairs were also made to the port boiler economizer during the ship's stay in Manila from September 25 to October 3.

Meanwhile, the first assistant engineer, who had been in charge of all repairs, had been released from the service of the vessel on September 25 following disagreements with the chief engineer. The third assistant engineer was requested to act as new first assistant. He reluctantly agreed, understanding that he would continue with his regular duties as a watchstanding officer as well.

On October 3 preparations were made to depart the port of Manila.

The new first assistant engineer had the 12 to 4 sea watch in the engineeroom and found all machinery in satisfactory condition. However, the forward reciprocating feed pump had been taken apart and not reassembled prior to departure, and the chief engineer testified that in the forenoon hours of that day another leak was found in the port boiler. The chief engineer determined that the leak was minor in nature, coming from the area of the port boiler economizer, and that it could be repaired underway without causing the vessel to be delayed in port. This would require the port boiler to be off the line while repairs were made. At 4 p.m., the chief engineer reported to the master that he was having trouble maintaining the water level in the boilers. The chief engineer testified that he thought the trouble was with the port boiler and that the trouble was confined to a leaking hand hole plate in the port boiler economizer which merely required tightening. He stated that the repairs and test were completed, and at about 4 a.m. on October 4 both boilers were again placed in operation.

Fifty-six minutes later, while the engineering plant was being restored to normal at-sea steaming, No. 1 gen-

erator sustained a major casualty. The emergency generator came on the line supplying emergency lighting. During this time, both coffin turbine feed pumps started malfunctioning. By 7:30 p.m. repairs had been made, and the vessel's speed was back to full ahead. On October 5, at about 7:45 a.m., the chief engineer was told that both boilers and the direct contact deaerating (d.c.) heater were all losing water. It was decided to cut out the starboard boiler and attempt to steam on the port boiler in an effort to isolate the difficulty to one of the boilers. It could not be determined which boiler was the source of the leak. While the vessel steamed on the port boiler at reduced speed, it was noted that the water level in that boiler continued to drop. The chief engineer ordered fires relit in the starboard boiler and that boiler put back on the line. After the transfer had been completed, the starboard boiler was also losing water, and the water level in the d.c. heater could not be maintained. The conclusion that both boilers were leaking was inescapable.

At 8:12 a.m. on October 5, engineeroom crew reported to the bridge that the ship was going to be blacked out because both boilers were secured and during the previous day's electrical



The above photograph, taken looking aft on the *Steel Vendor*, gives an impression of the vessel's list as she lay stranded on the reef.

casualty, the battery-operated electric starter motor on the emergency generator had burned out. The emergency generator was started by means of a fabricated hand crank at about 11:35 a.m., and the wash water pump was jury-rigged with a garden hose and used to start to fill the d.c. heater with wash water. It was the chief engineer's opinion that if he could fill the starboard boiler and the d.c. heater, he could raise steam on the starboard boiler and start repairs on the other boiler. The wash water pump had been pumping water to the d.c. heater for about 6 hours when the "filling valve" to the double bottom was discovered open. According to the chief engineer, the acting first assistant had apparently neglected to close this valve, and all the water was drained out of the d.c. heater. The chief engineer reported to the master at 4:45 p.m. that the problem with the boilers appeared hopeless and it might be best to request a tow. This was done, and the tug *Buckeye* was dispatched from Saigon, RVN.

The situation aboard the *Steel*

Vendor was growing grim. She was dead in the water, rolling 35° to 40° in heavy seas and force 9 winds. Bilge water was about 14 inches deep and was sloshing over the deck plates in the engine room. Limited power was available from the emergency generator for lighting and ventilation. Hand tools were sliding across the deck plates and disappearing in the bilges. Sea water was coming in the stack from the wind-driven seas and was dripping down on the men and equipment in the engine room. Throughout October 6 the engineers continued their efforts to restore the plant under these conditions. They discovered a bad leak in one screen tube in the port boiler and plugged it. Being satisfied that this was the sole source of the leak, they closed the boiler up and began the tedious process of filling the boiler with water by using a garden hose through the test cock and the air cock. All valves on the starboard boiler were directed to be secured so only the port boiler would fill, and the fires were lit in the port boiler. After steam was raised to

about 260 psi, it was noted that water was rising in the starboard boiler and dropping in the d.c. heater, apparently through the starboard boiler feedline which had been left cracked open inadvertently. Water was lost from the d.c. heater, requiring securing the fires in the port boiler due to loss of suction by the turbine feed pumps. It was also apparent by this time that there remained a leak from an unknown source in the port boiler. This was not considered serious, however, as it was felt that the boiler could be steamed and the water level maintained once the d.c. heater and the boiler were again refilled.

During the morning hours of October 7, the d.c. heater was again filled. The chief engineer spoke with the master and told him that he could get steam up in the port boiler and get the ship underway on limited turns by about 3 or 4 p.m. It was very shortly later that the reef was sighted and the full extent of the vessel's danger realized.

The engineers' repair efforts continued at a still more urgent pace. Three fires were lit shortly after 1 p.m. in the port boiler when the water level appeared sufficient in an attempt to raise steam as quickly as possible. Steam pressure reached about 220 psi and a generator was placed on the line. The chief engineer had just informed the master that he could make 25 revolutions on the main engine when the vessel slammed into the reef.

Weather and Navigation

While the *Steel Vendor* was in Manila prior to her departure, no radio watch had been maintained, and no weather information was received from shore. Upon departure, the master talked to the Manila Bay pilot about the weather ahead. "There is typhoon several hundred miles off the east coast to Luzon," he was told. The pilot debarked the vessel at 1:32 p.m., and the *Steel Vendor* departed from Corregidor Island on a course heading of 251° True at 3:36 p.m. on October 3. The destination was Cu



The crew of the *Steel Vendor* had prepared emergency gear for abandoning ship in the event that help did not arrive in time. The ship provided a lee to the crashing breakers enabling the crew to lower the inflatable liferafts without difficulty.

Lao Hon Island, northeast of Cape St. Jacques, off the coast of Vietnam. The master checked the charts and satisfied himself that the typhoon would pass astern of his vessel and pose no threat. No plot of the storm was maintained from subsequent weather advisory messages received during the remaining voyage.

Four days elapsed from the time the *Steel Vendor* departed Manila until the crew sighted Loaita Bank reef. During that time, the ship's officers were unable to establish the ship's position. The officers relied on the appropriate pilot chart and the set and drift calculated by the crew of the *Steel Vendor* in the same area several weeks earlier to estimate the set and drift of the vessel for dead reckoning purposes. Conditions were not suitable for determining the ship's position using radar, so her radar was not in use.

Conclusions

The Marine Board of Investigation concluded that the following significant events contributed to the loss of the *Steel Vendor*:

a. The inability of either reciprocating feed pump to supply feed water at a rate adequate to fire one or both boilers while taking suction from the double bottom tanks.

b. The time consuming methods of filling the d.c. heater and boilers with the wash water pump when the plant was lost and with only the emergency generator supplying limited electrical power.

c. The failure of the anchor to hold the vessel when it first touched bottom at about 2:20 p.m. on October 7, presumably due to the nature and the steepness of the contour of the bottom and the adverse weather conditions.

The Marine Board concluded that the decision of the master of the *Steel Vendor* to use only one of the vessel's anchors at the time of initial contact with the reef was prudent in view of the report from the engineroom that the vessel possibly would be able to get underway at any moment. The Board stated, "If two anchors were used, they could have possibly fouled

and thereby delayed the vessel from proceeding seaward away from the shoal area, if the engineers were able to get the vessel underway in time."

The Marine Board also found the following facts in support of a conclusion that there is evidence that the master failed to properly evaluate the current and effect of Typhoon *Elaine*, resulting in the vessel unknowingly drifting into dangerous water:

a. No plot of Typhoon *Elaine* was maintained aboard the vessel, thereby generating a misconception that the adverse weather being experienced was not the result of the typhoon. The *American Practical Navigator* by Bowditch, H. O. Publication No. 9, offers the following advice for navigators: "The first action to take if one finds himself within the cyclonic circulation (tropical cyclone) is to determine the position of his vessel with respect to the storm center." It is reasonable to expect that a prudent navigator would plot the movement of a nearby typhoon in an effort to detect any change in its direction of motion.

b. The information available from the pilot charts alone would indicate that a reasonably prudent navigator might expect a current setting to the northeast. However, due to the dates in question, consultation of the *Atlas of Surface Currents* would indicate the possibility of a current setting east-southeast. Further, if the vessel were set to the south of its track line by the westerly wind experienced after the vessel was dead in the water on October 5, 1971, the vessel could come under the effects of the southeasterly current set of 13.4 nautical miles per day. This apparently is what occurred and accounts for the vessel stranding on Loaita Bank Shoal some 90 miles south of her last dead reckoning position.

In this regard, the NTSB stated:

The captain's failure to plot the typhoon was a departure from good practice, since knowledge of a typhoon's course and position is important for planning correct evasive action. However, because such a plot would not have altered the difficulty of determining the ship's set and drift, this neglect did not contribute to the loss of the ship.

The Marine Board reached the following additional conclusions:

There is evidence of negligence on the part of [the master] in that he

knowingly departed the port of Manila on October 3, 1971, with knowledge that the SS *Steel Vendor* was experiencing mechanical difficulty with one of the boilers which would require the boiler to be taken off the line for an undetermined length of time to make repairs at sea. This would require operating at reduced speed and maneuverability on one boiler. In addition, [the master] should have known prior to the departure of the Manila Bay pilot that adverse weather conditions could be expected from the approaching typhoon.

There is evidence of negligence on the part of [the chief engineer] in that he did not fully explain the possible effects of the unknown leak in the boiler to [the master] and that he described the problem as minor. At the time, [the chief engineer] did not know the actual source of the leak, but did have knowledge that the vessel was experiencing repetitious failure of the elements of the economizer and the leak could quite possibly be another failure of this type. Further, on departure from Manila, [the chief engineer] had knowledge that the forward reciprocating feed pump was inoperative and disassembled and that the after reciprocating feed pump would not supply feed water at a rate sufficient to operate a steaming boiler. Therefore, it was foreseeable that if the leak increased in size or if other leaks developed, there would be a resulting loss of the d.c. heater and the safety of the vessel could be placed in immediate jeopardy.

There is evidence of inattention to duty on the part of [the first assistant engineer] in that he inadvertently failed to properly secure the feed valve on the starboard boiler, on October 5, 1971, during the filling of the port boiler with water, resulting in a delay in lighting-off the port boiler.

In addition to its finding regarding the probable cause of the loss of the *Steel Vendor*, the NTSB concluded that the following contributed to the accident:

1. The crew's inability to maneuver the ship which was the result of damaged boilers and inoperable feed pumps.

2. Limitation of the engineering plant design, which did not provide for filling and testing a boiler when both boilers were secured.

3. Errors in operating and maintenance.
(Continued on page 90)

safety as others see it

SAFETY: we are the enemy

By Hank A. Moran

In view of the fact that more than 85 percent of all accidents in the marine industry occur through human error rather than by gear and equipment failure, it follows that engineering for safety must begin with the human being.

Each worker has his own problems and troubles to resolve. Each individual has hopes and ambitions, physical weaknesses as well as strengths. Each is self-motivated with his own interests and values. In going through life, he has taken and will take many short cuts and chances. He has formed and will form many unsafe habits. But, because he is unique, man cannot be programed like a machine. He has to be treated as an individual.

Safety is a very personal problem and here lies the often overlooked key to accident prevention. Injuries occur to a person, and, regardless of the agent producing the injury, mechanical, electrical or chemical, the method by which the agent acted, or the sequence of events, the one common denominator in all injury mathematics is the human being.

Because few men are gifted with foresight, they tend to disregard safety regulations which interfere with what they want to do at the moment. They adjust machinery while it is in motion, remove guards which are not welded on, and forget to lock out a switch. Old ways, repeated and reinforced because they get the job done, tend to become habits which result in accidents. It's axiomatic that man does not like to adopt new ways because new procedures demand a change in behavior, learning new skills or altering attitudes. It's human and completely normal to resist change when we are getting along to our own satisfaction.

To limit injuries, managers must resist the temptation to write a manual or set of safety regulations, issue a statement supporting the safety effort, and then await the day that injuries stop. Accident prevention will never be that simple. If it were, injuries would have disappeared from the industrial scene years ago, for many companies, both large and small, have approached the problem from the viewpoint that established rules and regulations will prevent accidents.

Unfortunately, one fundamental fact is overlooked. The very person with the most to lose by injuries—the

worker—is the weak link in the safety chain. Safety involves a constant battle against the negative forces of human indifference, carelessness and negligence. Just one weak link in the chain of operations can, and often does, result in disaster. A poorly rigged or defective gangway can result in injury to ship personnel or longshoremen. Yet some masters and deck officers are offended when a potential hazard is pointed out to them, even though safety is their responsibility.

Poor maintenance of cargo gear also can result in tragic consequences. In a recent accident, a stevedore suffered a fractured skull when a fairlead on a cargo boom fell into the hold. Investigation revealed the cargo runner was too short to reach the lower hold. When it ran out during cargo operations, the runner pulled free from the securing clamp on the winch drum, breaking the fairlead strap and causing the fairlead sheave to fall into the hold.

This cargo runner, normally 800 feet in length, was found to be only 635 feet long. This shorter length did not permit a minimum three turns to remain on the drum when the load was landed.

The ship's hull history card indicated the cargo runner to be 800 feet long when installed. No one in the crew could account for the short length. One might speculate that either an improper length was installed initially, or that a damaged piece had been removed. Whatever the reason, the accident points up the need for continuing vigilance necessary to prevent human suffering—by preventing accidents.

All men sometimes do things of which they are not proud. And we don't necessarily appreciate the person who reminds us. Because we do not want our inadequacies to become known, we always have our mental fists up to protect our pride, to save face.

Self esteem is indeed one of man's basic needs. Men will quarrel, even fight, to protect it. This is an important point for the supervisor whose workers feel their boss is too inquisitive about "their business." They might fear that their inefficiencies or shortcomings will be exposed, and they may be embarrassed. Defensive men tend to reject new ideas, new methods. They don't want anyone prying into their operations, or offering advice. In dealing with men who have a defensive manner, a good supervisor must balance the scales, praising good performance and safety practice, while offering logical suggestions for improvement.

Even though this is the era of the expert, people throughout our society tend to resist the specialist who comes around to see what's going on—and to offer unsolicited advice. That's human too, but the trained safety engineer can make a contribution, in improving work practices or in design of safety equipment.

As the safety of the physical work environment has improved because of stringent design standards, safer equipment, inspections and material testing programs, and use of guards, interlocks, and other devices, the safety record also has improved. Today, human error is involved in the vast majority of injury-causing accidents. But, controlling the human being is obviously a much more complex undertaking than redesign of equipment or work spaces.

Meeting the challenge of safety requires knowledge, fortitude and persistence on the part of all shipboard supervisors in conducting on-the-job training and follow-up procedures. It demands understanding people and the forces which motivate them. Supervisors, from the master down, must enforce accident prevention practices. However, it should be recognized that no safety program can ever hope to reach perfection. Human beings never will be infallible. Human minds will wander; frustrations have an adverse impact on behavior; uncomfortable working conditions affect physical coordination, and fatigue takes it toll and hampers both judgment and physical

responses. Lack of knowledge, familiarity with equipment and professional skills also tend to be reflected by rising accident rates.

All of these truths should be recognized by worker and supervisors alike. It may well be true, as a managerial doctrine indicates, that everyone's work is no one's work. But, safety is an obvious exception to the rule. Safety is everyone's job.

An ounce of prevention is indeed worth pounds of cure. Alertness and awareness of danger are important to the safe worker, for a man who knows an accident can occur will try to avoid it. If a crew member expects that a hatch might become unlatched and fall on him, he will make certain that the toggle pin secures the latch before he descends the ladder into the compartment below, for survival is most paramount among human needs.

A well organized and effectively implemented safety program is a means to an end, a system for insuring human survival and limiting painful injury. It is a means of promoting efficiency and economy, for safe workers are more productive, as is well maintained equipment and machinery. And efficiency, economy and maximum utilization of available assets are necessary elements for the Military Sealift Command's operational success. In short, everyone has a stake in safety—and all share the responsibility.

—Courtesy Sealift

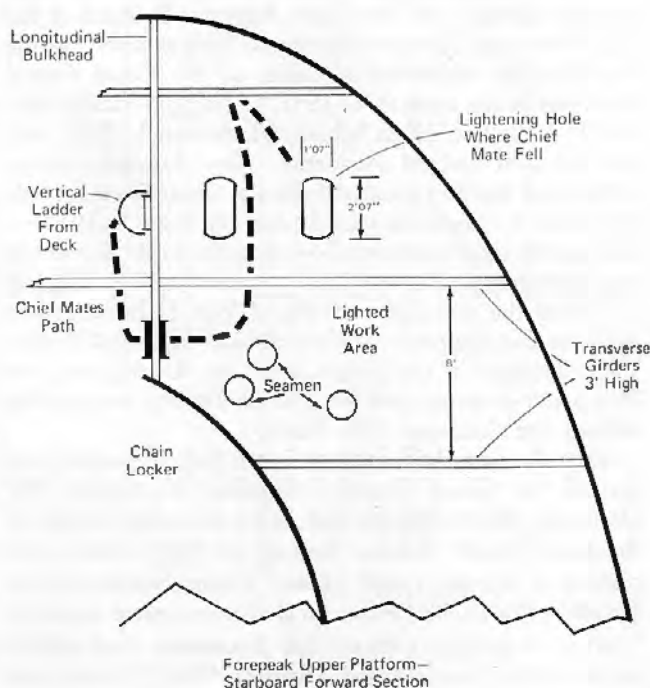
lesson from casualties

On a Chevron VLCC recently, the chief officer fell through a lightening hole in the upper platform deck of the forepeak while inspecting the progress of a rust and sediment clean-up job. He fell to the second platform, 24 feet below, and suffered very serious injuries. We are happy to report that he is progressing steadily toward full recovery.

How could such an accident happen?

As none of the other men working in the forepeak actually witnessed the accident, and the mate is unable to recollect his own actions, we have only circumstantial facts to determine the cause:

1. The mate was a careful, experienced officer; young and in good health, with excellent eyesight.
2. He was familiar with the layout of the forepeak and knew that there were openings in the platform decks.
3. The forepeak was thoroughly ventilated and the atmosphere was tested to confirm normal oxygen and no hydrocarbon vapor before the crew entered.
4. Three portable tank lights were rigged to light the work areas; and the mate carried a flashlight.
5. The platform surface was level, with no obstructions or loose gear to cause the mate to trip.



6. The deck plating was roughened by rust and not slippery; and the mate was wearing stout work shoes with nonslip soles.

7. There were no overhead obstructions.

Given these circumstances, the most likely explanation for the mate's misstep is that it was the result of a momentary lapse in his attention to where he was walking, combined with less than perfect illumination.

How can such accidents be prevented?

There are many work locations and many work occasions aboard ship where a slip, trip, or misstep can lead to an injurious fall. Your best safeguard against such an

accident happening to you, is your own alertness and caution.

Whenever your work takes you in and around tanks, cofferdams, and void spaces remind yourself to be apprehensive. Be suspicious of the walking surfaces, the climbing steps and platforms, the ladder rungs and hand holds. Test them before you trust your full weight on them. Use a good flashlight wherever lighting is poor. Watch ahead for slippery spots, loose scale, tripping hazards, and unguarded openings. Above all, keep aware that you are in an area not designed for routine work or traffic.

—Courtesy, Chevron Safety Bulletin

MARINE SAFETY COUNCIL MEMBERSHIP

The membership of the Marine Safety Council has changed quite dramatically in recent months. This is the first in a series of articles designed to introduce readers to the various personalities who comprise the Marine Safety Council. One member of the Council will be covered each month.

It is fitting to begin with the new chairman. He is Rear Admiral R. A. Ratti, and is chairman by virtue of his present position as the Coast Guard's Chief Counsel. He has held both positions since May 1973.

Admiral Ratti was born at Humacao, P.R., in 1922. During his youth, he saw much of the world traveling with his parents, the late Capt. Augustus P. Ratti of the U.S. Coast and Geodetic Survey and his mother. By the time he was appointed a Cadet at the Coast Guard Academy in the summer of 1941, he had graduated from the F. A. Bellows High School, Mamaroneck, N.Y., and the Admiral Billard Academy, New London, Conn.

Admiral Ratti graduated from the Coast Guard Academy with a commission as Ensign on June 7, 1944—a year earlier than the normal 4-year curriculum due to the war emergency. He was later awarded a B.S. Degree.

During the remainder of World War II he served as assistant damage control officer aboard the patrol frigate USS *Glendale* in campaigns at Palau, Ulithi, and the Philippine mop-up, and on Pacific convoy escort duty aboard the destroyer USS *Poole*.

After the war, Admiral Ratti's sea duty included tours aboard the Coast Guard icebreaker *Northwind*, the Destroyer Escort *Falgout* and as commanding officer of the Buoy Tender *Balsam*. Among his shore duties were command of the Coast Guard Loran Station Ebeye Island in the Pacific; inspector and investigator duties at Marine Inspection Offices, San Francisco; legal officer at the 12th Coast Guard District; Chief, Claims and

Litigation Division at Coast Guard Headquarters; and as inspector general of the Coast Guard immediately prior to his present post of chief counsel.

Admiral Ratti obtained his law degree with distinction from George Washington University Law School in 1956, graduating first in his class. He was appointed permanent rear admiral as of May 25, 1972. He is married to the former Ruth Anne Holland of Seattle, and they have three daughters and a son. ⚓



Rear Admiral R. A. Ratti, Chairman, Marine Safety Council.

COAST GUARD RULEMAKING

(Status as of 1 March 1974)

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
1972 PUBLIC HEARING							
Tailshaft inspection and drawing (67-71, 4-71).....	3-1-72	3-27-72	4-3-72	X			
Portable foam firefighting equipment—tank vessels (CGD 72-138).....	3-1-72	3-27-72	4-3-72			2-28-74	6-1-74
ANCHORAGE REGULATIONS							
Henderson Harbor, NY (CGD 74-6).....	1-11-74		2-15-74	X			
San Juan Harbor, P.R. (CGFR 72-12).....	2-1-72		3-4-72	X			
Wilmington River, Ga. (CGD-259).....	11-25-71		12-27-71	X			
San Diego Harbor (CGD 72-228).....	12-5-72		1-8-73	X			
Juan De Fuca, Wash. (CGD 72-233).....	12-5-72		1-9-73	X			
Milwaukee Harbor, WI (CGD 73-48).....	3-19-73		4-16-73	X			
Sodus Bay, NY (CGD 73-84).....	4-27-73		5-29-73	X			
Potts Harbor, ME (CGD 73-124).....	6-19-73		7-20-73	X			
Puget Sound Area, WA (CGD 73-180).....	8-24-73		9-28-73	X			
North East, MD (CGD 73-189).....	11-29-73		12-31-73			2-12-74	3-8-74
Delaware Bay and R. (CGD 73-190).....	12-28-73		2-15-73	X			
BOATING SAFETY (GENERAL)							
Termination of unique vessels (CGD 73-40).....	3-14-73	5-8-73	5-14-73	X			
BRIDGE REGULATIONS							
Nansemond R., Va. (CGD 72-224).....	11-11-72		12-15-72	X			
John Day R., Blind Slough, Clatskanie R., Oregon (CGD 72-231).....	11-28-72		1-2-73	X			
Nanticoke, Del. (CGFR 71-142).....	11-24-71		12-24-71	X			
Ogden Slip, Chicago, Ill. (CGFR 72-16).....	2-2-72		3-7-72	X			
Pascagoula R., MS (CGD 73-140).....						12-6-73	12-1-73 through 4-15-74
Sacramento R. et. al., CA (CGD 73-142).....	7-20-73		8-21-73	X			
Westchester Ck., NY (CGD 73-166).....	8-10-73		9-11-73	X			
Cheesequake Ck., NJ (CGD 73-162).....	8-10-73		9-11-73	X			
Green R., KY (CGD 73-171).....	8-21-73		9-25-73			2-19-74	3-18-74
AIWW, Mile 342, Fla.; Drawbridge Operations (CGD 72-190P).....	9-30-72		11-1-72	X			
Spa Creek, MD (CGD 73-13).....	1-26-73		3-6-73			1-25-74	4-1-74
Long Island Inland Waterway (CGD 73-23).....	2-12-73		3-30-73	X			
Shaws Cove, CT (CGD 73-72).....	4-18-73		5-18-73	X			
Scuppernong R., NC (CGD 73-111).....	corrected 5-1-73						
Rahway R., NJ (CGD 73-196).....	5-29-73		7-3-73	X			
Alabama R., AL (CGD 73-195).....	9-11-73		10-16-73	X			
Ashcpoo R., SC (CGD 73-198).....	9-11-73		10-16-73	X			
Red River, LA & AR (CGD 73-197).....	9-11-73		10-16-73	X			
Corte Madera CK, CA (CGD 73-199).....	9-11-73		10-16-73	X			
Back Bay of Biloxi, MS (CGD 74-37).....						2-21-74	2-15-74 through 8-13-74
Little Manatee R., FL (CGD 74-41).....	2-21-74		3-19-74				
Grand R., Grand Haven, MI (CGD 74-42).....	2-21-74		3-19-74				

Coast Guard Rulemaking—Continued

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
Genesee R., NY (CGD 73-203).....	9-13-73	.....	10-16-73	X	.....	.....	.....
Navigable Waters in LA (CGD 73-214)	9-27-73	.....	10-30-73	X	.....	.....	.....
Puyallup R., WA (CGD 73-215).....	10-3-73	.....	11-6-73	.....	.....	2-12-74	3-12-74
Stony Ck., MD (CGD 73-242).....	10-12-73	.....	11-20-73	X	.....	.....	.....
Lake Washington Ship Canal, WA (CGD 73-255).....	11-13-73	.....	12-18-73	X	.....	.....	.....
Copper R., NJ (CGD 74-17).....	1-23-74	.....	2-19-74	X	.....	.....	.....
AlWW, Hillsboro Inlet, FL (CGD 74-22).....	1-25-74	.....	3-1-74	.....	.....	.....	.....
HAZARDOUS MATERIALS							
Dichlorobutene, Corrected, F.R. 9-20-72, Hazardous Cargoes (CGD 72-162PH).....	8-30-72	10-24-72	10-31-72	X	.....	.....	.....
Certification of Cargo Containers for Transport under Customs Seal (CGD 72-139).....	11-17-72	.....	12-19-72	X	.....	.....	.....
Miscellaneous Dangerous Cargoes (CGD 72-182).....	11-11-72	12-12-72	12-19-72	X	.....	.....	.....
Marking of radioactive materials packages (CGD 73- 137).....	8-31-73	9-25-73	10-5-73	X	.....	.....	.....
Dangerous Cargoes, miscellaneous amendments (CGD 73-173).....	9-5-73	9-25-73	10-5-73	X	.....	.....	.....
Dangerous Cargo Regulations, miscellaneous (CGD 73-249).....	1-16-74	.....	3-4-74	.....	.....	.....	.....
MARINE ENVIRONMENT AND SYSTEMS (GENERAL)							
Oil pollution prevention (CGFR 71-160, 161).....	12-24-71	2-15-72	4-21-72	X	.....	12-21-72	7-1-74 ¹
Marine Sanitation Devices (CGD 73-83).....	Adv. 6-18-73	.....	8-15-73	X	.....	.....	.....
Vessel traffic system, Puget Sound (CGD 73-158).....	8-6-73	8-30-73	9-17-73	X	.....	.....	.....
Security Zone, New London CT (CGD 73-182).....	8-23-73	.....	9-28-73	X	.....	.....	.....
Chesapeake Bay entrance (CGD 73-152).....	9-4-73 12-18-73	2-11-74	1-23-74	X	.....	.....	.....
MERCHANT MARINE SAFETY (GENERAL)							
Compressed Gas Cylinders (CGD 72-115PH).....	8-31-72	9-28-72	10-2-72	X	.....	.....	.....
Oceanographic vessels, fire main systems (CGFR 72-20).....	2-4-72	.....	3-19-72	X	.....	.....	.....
Water lights, floating electric (CGFR 72-48).....	3-9-72	4-18-72	4-24-72	X	.....	.....	.....
Great Lakes Maritime Academy, List as a Nautical School-Ship (CGD 72-92P).....	8-9-72	.....	9-15-72	.....	.....	10-24-73	11-26-73
Ship's Maneuvering Characteristics Data (CGD 72- 134PH).....	8-22-72	9-28-72	10-13-72	X	.....	.....	.....
Unmanned Barges; hull construction (CGD 72-130).....	Supp. 7-20-73	.....	8-31-73	X	.....	.....	.....
Construction requirements for tank ships (CGD 72-245).....	10-31-72	12-19-72	12-29-72	X	.....	.....	.....
.....	Adv. 1-26-73	.....	3-15-73	.....	.....	.....	.....
.....	Supp. 7-5-73	.....	.....	.....	.....	.....	.....
Emergency Position Indicating Radio Beacons (CGD 73-24).....	3-5-73	4-18-73	4-30-73	X	.....	.....	.....

¹ Various effective dates precede that indicated. See Federal Registers of 12-21-72 and 8-24-73.

Coast Guard Rulemaking—Continued

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
Firemen's outfits on manned tank barges (CGD 73-11)...	4-26-73	On request	5-28-73	×			
Dry chemical fire extinguisher requirements (CGD 73-73).....	6-8-73		7-10-73	×			
Great Lakes pilot rules (CGD 73-100).....	8-1-73		9-3-73	×			
Lifboat winches for merchant vessels (CGD 73-103)...	8-21-73		9-28-73	×			
Lifesaving equipment specification (CGD 73-130).....	8-28-73		9-28-73	×			
	Supp. Notice						
Inflatable liferafts (CGD 73-160).....	1-16-74		2-16-74				
Liferafts for merchant vessels (CGD 73-116).....	9-27-73		10-31-73	×			
Radar observer licensing (CGD 73-238).....	10-3-73		11-2-73	×			
Pressure vessels (CGD 73-133).....	10-12-73		11-30-73	×			
Portable tanks (CGD 73-172).....	10-12-73		11-16-73	×			
	12-5-73	1-15-74	1-21-74	×			
		New Orleans					
Marine engineering amendments (CGD 73-248).....	12-11-73		1-14-74	×			
Unmanned Platforms (CGD 73-177).....	1-8-74		2-25-74	×			
	Corrected 1-29-74						
Releases, Lifesaving Equipment, Hydraulic and Manual (CGD 73-153).....	1-8-74		2-25-74	×			
Light Intensity Standards (CGD 74-7).....						1-25-74	7-1-74

NOTE: This table which will be continued in future issues of the Proceedings is designed to provide the maritime public with better information on the status of changes to the Code of Federal Regulations made under authority granted the Coast Guard. Only those proposals which have appeared in the Federal Register as Notices of Proposed Rulemaking, and as rules will be recorded. Proposed changes which have not been placed formally before the public will not be included.

AMENDMENTS TO REGULATIONS

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of Transportation

SUBCHAPTER D—TANK VESSELS (CGD 72-138)

PART 34—FIREFIGHTING EQUIPMENT

Deck Foam System; Details

The purpose of this amendment to the firefighting equipment regulations is to require at least one outlet for a hose line and foam nozzle at each foam station in the cargo area of tank ships. Hand-held appliances provide flexibility to reach cargo areas shielded from the mounted appliances and

to complete final stages of fire extinguishment. Current regulations allow hand-held appliances to be optional, although no tank vessel is being built without such appliances.

The amendment also clarifies the number of hand-held devices required to be carried. The former requirements could be construed to require one hand-held device for each hose outlet at each monitor station. This amendment requires carriage of a sufficient number of hand-held appliances to outfit hose outlets at the two foam stations having the most hose outlets.

These amendments are based on a notice of proposed rulemaking which

was published in the March 1, 1972, issue of the Federal Register (37 FR 4292) and the Marine Safety Council Hearing Agenda, dated March 27, 1972. The proposal appeared as item 5 in the notice of proposed rulemaking and the agenda.

Interested persons were given the opportunity to submit written comments and to make oral comments at the public hearing. No comments, written or oral, were received. Nonetheless, the proposed amendment contained an ambiguity in the requirements for the required number of hand-held appliances and the required number of outlets for such appliances. There was further ambiguity

ity regarding stowage of hand-held appliances. This amendment has been modified to remove these ambiguities without changing the substantive provisions of the amendment. Accordingly, the Coast Guard adopted the proposal with only editorial changes.

In consideration of the foregoing, part 34 of title 46, Code of Federal Regulations, is amended as follows:

1. By revising § 34.20-15(c) to read as follows:

§ 34.20-15 Piping—T/ALL.

* * * * *

(c) The piping and outlet arrangement shall allow the required rate of applications as contained in § 34.20-5(b), to any portion of the open deck of the cargo area through the use of the mounted and hand-held appliances

that are provided. At least 50 percent of the required rate of application shall be from the mounted appliances. One or more hose outlets for hand-held appliances shall be provided at each foam station. For enclosed spaces, application of at least 1.6 gallons per minute water rate for each 10 square feet of the enclosed area for 5 minutes is acceptable. For the purpose of this paragraph, all piping is assumed to be damaged in way of the fire and an adequate number of valves shall be fitted to prevent loss of foam by closing valves to damaged piping.

* * * * *

2. By amending § 34.20-20 by revising paragraph (b) and adding paragraph (c) to read as follows:

§ 34.20-20 Discharge outlets—T/ALL.

* * * * *

(b) At least one mounted foam appliance shall be provided for each station that is required in § 34.20-15(c).

(c) The number of hand-held appliances provided shall be at least equal to the number of hose outlets at the two foam stations having the most hose outlets. Hand-held appliances shall be stowed in a well marked, readily accessible position that cannot be isolated by a fire involving the cargo tanks.

Effective date. This amendment shall become effective on June 1, 1974.

(Federal Register of Feb. 28, 1974.)

STEEL VENDOR

(Continued from page 83)

nance procedures committed by the crew because of lack of competence and proper supervision.

4. The deck officers' inability to plot the vessel's position and to determine its set and drift.

5. Failure by the ship's officers to report the malfunction of the boilers, feed pumps, and ship's service generator to the Coast Guard while the ship was in Manila.

In his action on the report of the Marine Board of Investigation, the Commandant of the U.S. Coast Guard added the following remarks:

1. Although the casualty resulted after the failure of tubes in both the port and starboard boilers, the cause of the casualty was the drifting onto the reef at Loaita Bank after having lost all propelling power.

2. Contributing to the cause of the casualty was the obvious poor condition and lack of maintenance of the engineering plant of *Steel Vendor*. The Coast Guard is examining existing vessel inspection frequency and a research and development study into inspection techniques, particularly as directed at older vessels is in the planning stages. In addition, our In-

formation and Analysis Staff will continue to point to possible trouble areas through computerized sorting of inspection and casualty data.

3. In addition, it is evident that some of the ship's licensed officers were negligent in the performance of their duties during the several failures experienced by *Steel Vendor*.

In accordance with the recommendations of the Marine Board of Investigation appropriate action under the provisions of the Suspension and Revocation Procedures has been completed against the negligent officers of the *Steel Vendor*.

Recommendations

The NTSB recommended that:

1. The Coast Guard study the need, based on frequency of simultaneous boiler failure, for all steam vessels certificated for ocean service to have a means of filling and hydrostatically testing the propulsion boilers with an electrically driven pump that can be powered from the emergency generator.

2. The Coast Guard publicize to the merchant marine industry, the importance of the requirement in the U.S. Code, title 46, section 234, that

all licensed officers must notify the Coast Guard of all significant hull, machinery, boiler, or equipment failures for any vessel on which such licensed officers sail.

3. The Coast Guard consider the feasibility of requiring all U.S. ships on an ocean voyage to have on board long-range, electronic navigation capability.

The NTSB concurred in the Commandant's decision that the Coast Guard should conduct a research and development study of the efficacy of its inspection techniques, particularly those directed towards older vessels.

NOTE.—The above article is based upon the Marine Casualty Report of the incident, comprised of the U.S. Coast Guard Marine Board of Investigation Report and Commandant's Action and the action by National Transportation Safety Board released October 15, 1973. Copies of the full Marine Casualty Report may be obtained by writing Commandant (G-MVI-3), U.S. Coast Guard, Washington, D.C. 20590.

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.¹ 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 Saturday, Sunday, and holidays.) The date of each Coast Guard publication in the table below is indicated in parentheses following its title. The dates of the Federal Registers affecting each publication are noted after the date of each edition.

The Federal Register will be furnished by mail to subscribers, free of postage, for \$5.00 per month or \$45 per year, payable in advance. The charge for individual copies is 75 cents for each issue, or 75 cents for each group of pages as actually bound. Remit check or money order, made payable to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated October 1, 1973 are now available from the Superintendent of Documents price: \$5.80.

CG No.	TITLE OF PUBLICATION
101	Specimen Examination for Merchant Marine Deck Officers (7-1-63).
101-1	Specimen Examinations for Merchant Marine Deck Officers (2d and 3d mate) (10-1-73).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (4-1-72). F.R. 7-21-72, 12-1-72.
115	Marine Engineering Regulations (6-1-73) F.R. 6-29-73.
123	Rules and Regulations for Tank Vessels (1-1-73). F.R. 8-24-73, 10-3-73, 10-24-73, 2-28-74.
129	Proceedings of the Marine Safety Council (Monthly).
169	Rules of the Road—International—Inland (8-1-72). F.R. 9-12-72.
172	Rules of the Road—Great Lakes (7-1-72). F.R. 10-6-72, 11-4-72, 1-16-73, 1-29-73, 5-8-73.
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 (3-1-73).
176	Load Line Regulations (2-1-71) F.R. 10-1-71, 5-10-73.
182	Specimen Examinations for Merchant Marine Engineer Licenses (7-1-63).
182-1	Specimen Examinations for Merchant Marine Engineer Licenses (2d and 3d Assistant) (10-1-73).
184	Rules of the Road—Western Rivers (8-1-72). F.R. 9-12-72, 5-8-73.
190	Equipment List (8-1-72). F.R. 8-9-72, 8-11-72, 8-21-72, 9-14-72, 10-19-72, 11-8-72, 12-5-72, 1-15-73, 2-6-73, 2-26-73, 3-27-73, 4-3-73, 4-26-73, 6-1-73, 8-1-73, 10-5-73, 11-26-73, 1-17-74, 2-28-74.
191	Rules and Regulations for Licensing and Certification of Merchant Marine Personnel (6-1-72). F.R. 12-21-72, 3-2-73, 3-5-73, 5-8-73, 5-11-73, 5-24-73, 8-24-73, 10-24-73.
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5-1-67). F.R. 3-30-68, 4-30-70, 10-20-70, 7-18-72, 4-24-73, 11-26-73, 12-17-73.
227	Laws Governing Marine Inspection (3-1-65).
239	Security of Vessels and Waterfront Facilities (3-1-72). F.R. 5-31-72, 11-3-72, 7-8-72, 1-5-73, 1-23-74.
256	Rules and Regulations for Passenger Vessels (5-1-69). F.R. 10-29-69, 2-25-70, 4-30-70, 6-17-70, 10-31-70, 12-30-70, 3-9-72, 7-18-72, 10-4-72, 10-14-72, 12-21-72, 4-10-73, 8-1-73, 10-24-73, 12-5-73.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (4-1-73). F.R. 6-28-73, 6-29-73, 8-1-73, 10-24-73.
258	Rules and Regulations for Uninspected Vessels (5-1-70). F.R. 1-8-73, 3-28-73, 1-25-74.
259	Electrical Engineering Regulations (6-1-71). F.R. 3-8-72, 3-9-72, 8-16-72, 8-24-73, 11-29-73.
266	Rules and Regulations for Bulk Grain Cargoes (5-1-68). F.R. 12-4-69.
268	Rules and Regulations for Manning of Vessels (10-1-71). F.R. 1-13-72, 3-2-73.
293	Miscellaneous Electrical Equipment List (7-2-73).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (7-1-72). F.R. 7-8-72.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (9-1-73). F.R. 1-25-74.
329	Fire Fighting Manual for Tank Vessels (1-1-74).
439	Bridge-to-Bridge Radiotelephone Communications (12-1-72).

CHANGES PUBLISHED DURING FEBRUARY 1974

The following have been modified by Federal Registers:

CG-123, Federal Register of February 28, 1974.

CG-190, Federal Register of February 28, 1974.

¹ Due to the paper shortage, certain publications may be temporarily out of stock. Titles 33 and 46, Code of Federal Regulations may be consulted for rules and regulations.

