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SS TRANSHURON: STRANDING AT KILTAN ISLAND ON 26 SEPTEMBER 1974 --ETC(U)
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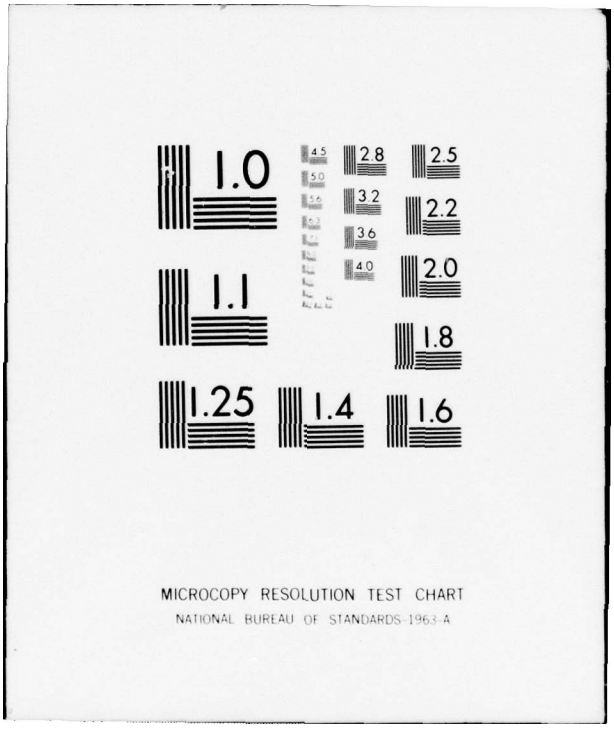
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DEPARTMENT OF TRANSPORTATION

COAST GUARD

MARINE CASUALTY REPORT

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U.S. COAST GUARD
MARINE BOARD OF INVESTIGATION REPORT
AND COMMANDANT'S ACTION

ACTING BY
NATIONAL TRANSPORTATION SAFETY BOARD

USCG/MTSB-MAR-77-2

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(19)

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. USCG/NTSB-MAR-76-2	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle MARINE CASUALTY REPORT - SS TRANSHURON Fire on 24 September 1974 and Grounding on 26 September 1974, Arabian Sea		5. Report Date September 16, 1976 6. Performing Organization Code
7. Author(s)		8. Performing Organization Report No.
9. Performing Organization Name and Address National Transportation Safety Board Bureau of Surface Transportation Safety Washington, D. C. 20594		10. Work Unit No. 1888 11. Contract or Grant No.
12. Sponsoring Agency Name and Address NATIONAL TRANSPORTATION SAFETY BOARD Washington, D. C. 20594 U. S. Coast Guard Washington, D. C. 20950		13. Type of Report and Period Covered MARINE CASUALTY REPORT 24 & 26 September 1974 14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract On 24 September 1974, the SS TRANSHURON (O.N. 506349), a converted T-2 tankship, was underway in the Arabian Sea when an iron nipple on the air conditioning system's condenser failed and caused water to be sprayed up and into the switchboard for main propulsion control. The main propulsion bus shorted and an electrical fire began. The control circuits were not secured; the CO_2 system failed to operate. Electrical power to the board finally had to be terminated by shutting down the drive turbine on the ship's service generator.

Before the fire was extinguished, it destroyed the propulsion switchboard, and as a result, the vessel was adrift without propulsion. The ship drifted into Kiltan Island on 26 September; its bottom opened and its cargo of Navy distillate fuel leaked out. The ship was abandoned without injury and left for salvors.

The National Transportation Safety Board determines that the probable cause of the accident was the loss of power by the SS TRANSHURON which resulted in the grounding of the vessel on Kiltan Island reef.

Contributing to the accident were the rendering inoperative of the vessel's propulsion switchboard by a fire, caused by the failure of the iron pipe nipple in the bronze condenser head, the reluctance of the Master of the SS TRANSHURON to accept offers of aid from other vessels, and his failure to use available information in order to anchor prior to the grounding of the vessel on Kiltan Island.

17. Key Words	18. Distribution Statement
Anchors and chain; corrosion; base material failure; crew competence; crew training; CO_2 system; decision point; distress communications; equipment maintenance; inspection effectiveness; polluting incident; ship grounding; ship propulsion system.	This document is available to the public through the National Technical Information Service, Springfield, Virginia 22151

19. Security Classification (of this report)	20. Security Classification (of this page)	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED		

NTSB Form 1765.2 (Rev. 9/74)

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SS TRANSHURON; STRANDING AT KILTAN ISLAND ON
26 SEPTEMBER 1974 WITHOUT LOSS OF LIFE

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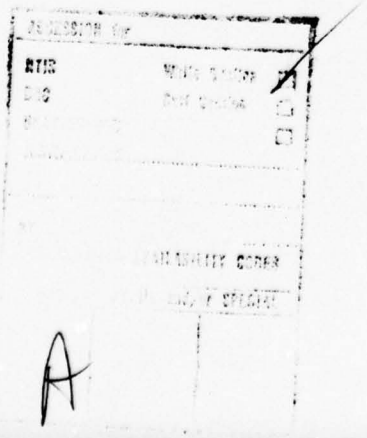

SS TRANSHURON
FIRE ON 24 SEPTEMBER 1974 AND GROUNDING
26 SEPTEMBER 1974
ARABIAN SEA

ACTION BY THE NATIONAL TRANSPORTATION SAFETY BOARD

This casualty was investigated by a U.S. Coast Guard Marine Board of Investigation which convened in San Francisco, California, on October 7, 1974. A representative of the National Transportation Safety Board observed part of those proceedings. The National Transportation Safety Board has considered only those facts in the investigative record which are pertinent to the Safety Board's statutory responsibility to determine the cause or probable cause of the casualty and to make recommendations. The Safety Board's analysis of the casualty is based on the evidence and testimony presented at the Marine Board of Investigation and should be read in conjunction with the Marine Board's Finding of Fact.

SYNOPSIS

On 24 September 1974, the SS TRANSHURON (O.N. 506349), a converted T-2 tankship, was underway in the Arabian Sea when an iron nipple on the air conditioning system's condenser failed and caused water to be sprayed up and into the switchboard for main propulsion control. The main propulsion bus shorted and an electrical fire began. The control circuits were not secured; the CO2 system failed to operate. Electrical power to the switchboard finally had to be terminated by shutting down the drive turbine on the ship's service generator.

Before the fire was extinguished, it destroyed the propulsion switchboard, and as a result, the vessel was adrift without propulsion. The vessel's master notified the company by radio of the fire and damage and requested tug assistance. Since the radio transmissions were handled routinely and since there was difficulty locating tugs, assistance was not ordered until 26 September; however, by that time the ship's personnel had determined that they would ground on Kiltan Island. The master sent urgent and distress messages to request aid from the nearest vessels. The TOSHIMA MARU responded and attempted to tow the TRANSHURON. A towing hookup was attempted, but was not successful; the TRANSHURON grounded about 1800 on 26 September 1974.

As the TRANSHURON drifted onto the reef, its bottom opened and its cargo of Navy distillate fuel leaked out. The ship was abandoned without injury and left for salvors.

The National Transportation Safety Board determines that the probable cause of the accident was the loss of power by the SS TRANSHURON which resulted in the grounding of the vessel on Kiltan Island reef.

Contributing to the accident were the rendering inoperative of the vessel's propulsion switchboard by a fire, caused by the failure of the iron pipe nipple in the bronze condenser head, the reluctance of the master of the SS TRANSHURON to accept offers of aid from other vessels, and his failure to use available information in order to anchor prior to the grounding of the vessel on Kiltan Island.

ANALYSIS

The Safety Board is concerned by five aspects of this casualty: (1) Role of plan approval and inspections in preventing casualties; 2) engineering casualty control and qualifications of licensed officers; 3) inspection and operational readiness of onboard firefighting equipment; 4) role of the master in decisionmaking in critical situations; and 5) maintenance of navigational equipment on merchant vessels.

The Role of Plan Approval and Inspections in Preventing Casualties

In 1966, the SS TRANSHURON, a 1945 MARAD designated T-2 tankship with two standard deckhouses, underwent an extensive conversion. This conversion rearranged the two deckhouses into one unit, which created a bridge-aft, engine-aft, tankship joined to a large cargo tank section and bow. The engineroom and living quarters were not altered except for a few additions, such as the air conditioning system. The plans for the entire conversion required approval by the Coast Guard.

According to the specifications, the air conditioning compressor, condenser, receiver, piping, and associated controls were to be mounted on a base-plate and located on the starboard side of the engineroom operating platform. The saltwater circulating pump was to be located on the lower level; the piping to supply cooling water to the condenser on the operating platform was to be run without interference with existing piping or machinery. In the cooling water discharge from the condenser, a regulating valve was to be installed with sensor leads to the compressor discharge.

The only indication of the approved location of the air conditioning machinery was in the specifications which were not approved until 16 March 1967. The conversion was completed during 1966 and certification of the TRANSHURON was completed in January 1967.

Because he did not know what the approved specifications called for, the inspector who inspected the conversion approved the location of the equipment "as installed." The saltwater pump had been placed on the lower level, which presented no location problem. However, the air conditioning equipment had been installed on the air compressor flat which was located on the port side directly beneath the propulsion switchboard. Evidently, in the inspector's judgment, the piping run to the condenser and the location of the condenser under the deck plate of

the operating platform that supported the switchboard did not conflict with 46 CFR 56.50-1(d) which prohibits piping runs in the vicinity of switchboards.

Usually, air conditioning equipment has the necessary internal controls and gauges to regulate all functions, including cooling water flow; there is usually no need for separately mounted gauges. In this case, however, when the cooling water pump needed repair, there was no alternate water supply. Consequently, some time after the ship was converted, a crossover was installed from the tank-cleaning pump to provide cooling water when the cooling water pump was being repaired. Since the tank-cleaning pump operated at greater pressure than the air conditioning pump, a control system was installed. The control system consisted of a gauge and a nipple on the bronze condenser head, and the crossover control valve was used as a throttle. (The Marine Board did not establish the date of this change.) The threaded nipple connection became an additional departure from the electrical equipment protection required by 46 CFR 56.50-1(d).

For the nipple to corrode and fail, several conditions must have been present. Corrosion occurs when two dissimilar metals, in this case the iron nipple and the bronze condenser, are in contact in the presence of saltwater. The amount of time it takes for corrosion to cause an iron nipple to fail depends on the additional corrosion condition factors of saltwater conductivity, water velocity, the amount of stress on the pipe threads, and the ratio of the areas of the dissimilar metals involved. Using published corrosion data and handbook data 1/ and applying the appropriate corrosion condition factors, it was determined that the nipple was installed about 2 years before this failure. Had the ferrous pipe in the corrosion-prone system been inspected, the buildup of corrosion would have been detected. The obscured, 3/4-inch nipple was not inspected when the tube nest and other portions of the condenser were cleaned in July 1974.

When the nipple failed, water was sprayed into the propulsion switchboard and precipitated the ensuing events. However, the placement of equipment before specifications were approved and the inspector's interpretation of the phrase, "in the vicinity," in 46 CFR 56.50-1(d) created the unsafe operating condition. The regulation requires that plans and specifications be approved before construction. Without the approved specifications to refer to, the Coast Guard inspector had no reason to suspect or to challenge the locations of the piping and condenser. In fact, the operating flat-platform deck would give the assurance that the air compressors and the new air conditioning equipment were separated from the switchboard. According to the Commandant's Action, the inspector did not err in allowing the location of the air conditioning equipment to be changed. The Safety Board does not endorse such a broad interpretation

1/ National Association of Corrosion Engineers -- Corrosion Data Survey 1974, p. 252. The Corrosion Handbook - Uhlig 1948, p. 422.

of the regulation, especially when one considers the non-watertight construction of the operating platform and the fact that no more than 6 feet separated the top of the condenser and the switchboard.

Subsequent inspectors at each recertification of the TRANSHURON did not question the location since they probably assumed that the proper approval procedure had been followed. The crossover change would not have been known by succeeding inspectors. The lack of adequate inspections and maintenance of the area which contained the nipple allowed the poor choice of materials to go undetected until after the casualty.

The Safety Board is concerned that inspections aimed at preventing such equipment failures are inadequate. The first inspection inadequacy was the inspection for the installation of the air conditioning system that had as an integral part the condenser involved in the fire. This installation was part of the conversion of the vessel and was included in the specifications. The packaged air conditioning unit did not require approval as did the specifications and refrigerant piping plans. The delay in approval of the specification deprived the inspector of a means for determining if the location of the condenser and associated piping was proper.

Engineering Casualty Control and Qualifications of Licensed Officers

When the nipple failed and water sprayed through openings provided for the propulsion cables, the short-circuit electrical fire erupted. At standard speed, the propulsion generator develops 2,300 volts and about 1,000 amperes. When the seawater sprayed into the bus bars, shorting began instantly through the water to the surrounding open switchboard bus bars and to the exposed electrical connectors. The arcing created explosive cracking and popping and caused the current-carrying equipment to overheat and melt. The insulation then burned and produced the smoke encountered by the firefighters.

In addition to the main generator circuits, the affected switchboard panel also contained the main propulsion excitation circuits. The excitation voltage on the ship was 125 V d.c. When arcing spread from the high potential bus to the excitation circuits and burned off the insulation, the exposed wire and connectors provided access to the excitation current as a source of energy for the heat and fire.

The crew's failure to terminate all electrical potential to the propulsion switchboard when the fire began caused the fire and, consequently, the casualty to be more severe. The watch engineer could have performed any one of the following procedures to remove all sources of potential from the main propulsion switchboard:

Method A

Rotate the excitation setup switch to off or to the center position.

Method B

Move the speed control level to low speed position, move the starting lever to off, and rotate the excitation setup switch to off or to the center position.

Method C

Trip the 110 kW d.c. generator circuit breakers and rotate the excitation setup switch to off or to the center position.

Method D

Stop on the online ship service generator turbine and, thus, terminate all electrical power to the ship.

Each of these options would have removed the excitation current, collapsed the propulsion generator field current, and terminated all generator output. However, 3 to 4 minutes passed before any action was taken to terminate electrical potential.

Method A as a one-step operation would probably cause severe arcing in the rotary switch contacts and is not normal or recommended action. It is, however, the most direct method to secure all potential to the propulsion contact switchboard.

Operability of the controls when shutdown was first attempted indicated the damage which already occurred. The speed control lever was still operable and its connected variable generator field coil resistor and speed-changer mechanism were still functioning as indicated by the reduction in speed of the generator when placed in the slow position. This amounted to a reduction to 60 percent of full load excitation current. The chief engineer attempted this shutdown and completed step 1 in Method B. The generator was still producing a voltage and current output corresponding to low speed operation. The contacts and moving gear in the complicated gang contact switch of the starting control lever had been destroyed sufficiently to prevent movement of this lever. With this lever in the run position and with the ship's service turbine driving both the 28 kW d.c. excitation generator and the 110 kW d.c. multi-purpose generator, the propulsion board continued to arc and burn, being supplied with electrical potential and water spray. It is to be noted that the air conditioning cooling water pump was still operating, supplying water to the condenser.

The next effort to control the fire involved tripping the circuit breakers on the 125 V d.c. panel by the first assistant engineer, completing step 1 in Method C. When this was done, the excitation current and potential to the propulsion motor was stopped as was the current to the shunt field on the main generator. A significant drop in electrical

power to maintain the fire was achieved through reduction of the excitation current. However, without moving the rotary excitation setup switch, the 28 kW d.c. excitation generator remained on the line, supplying power to the propulsion generator field through the switchboard. As the fire continued, the deterioration of switchboard equipment created short circuit conditions in the 28 kW d.c. generator circuits as indicated by the burned insulation in the generator coils. Not until 0341, when the ship's service generator turbine was secured, completing the single action of option D was the heat source removed. About 27 minutes had elapsed before the attempts to extinguish the fire could have been effective.

A basic contributor to this casualty was the failure of the watch engineer to know how to handle the operating equipment during an emergency situation. Basic to any firefighting effort is knowing the methods by which to terminate the heat source and isolate the damaged equipment. Although the Commandant also found the engineer's lack of knowledge to be a contributor to the casualty, there is no discussion in the Commandant's Action on insuring that such knowledge is tested by licensing procedures. During this casualty, the damage done in the first critical minutes of the fire could not be overcome when some of the equipment had been destroyed. The Safety Board believes that testing on casualty control procedures must include emergency equipment procedures as well as basic procedures for engineering operations.

Inspection and Operational Readiness of Onboard Firefighting Equipment

During the various attempts to control the fire by tripping switches on the propulsion control panel, an attempt was made to use the installed CO_2 system. The CO_2 system was for use on the propulsion generator and motor and for the propulsion and cargo pump cubicles on the main switchboard. Both the chief engineer and first assistant engineer went to use the control/manifold station at the main deck level. They followed the instructions mounted beside the pull boxes and valves; they pulled the cable at the right-hand side of the control/manifold station which should have caused the release of one 50 lb CO_2 cylinder or bottle. (The record does not establish the position of the manifold valve which routed CO_2 to the switchboard.) The first assistant stated that he opened the valve with a counterclockwise movement; the chief engineer stated that he opened the valves with a clockwise movement. There was no indication that the CO_2 had discharged (such as condensation on the manifold pipes, a cloud at the switchboard, or any reduction of fire and smoke). After the casualty, the operating levers on the cylinder were examined. Examination revealed that the levers could be moved their full range with no resistance, which indicated that the seal had been punctured. However, had the CO_2 systems operated properly, their value would have been decreased because recommended procedures for containing electrical fires by terminating power were not completed. 2/

2/ Firefighting Manual for Tank Vessels CG-239, p. 29, Chapter 4, Section 1 Basic Steps.

The inspection of CO_2 fire extinguishing systems is an area in which Coast Guard inspectors rely on support services. As the record shows, the inspection of CO_2 firefighting equipment is a function which is shared between the Coast Guard inspector and a commercial service company representative. After the company representative overhauls the operating gear and weighs the bottles (as required by 46 CFR 31.10-18(a) and (e)), the Coast Guard inspector witnesses an operational check. Cables are pulled and cutter heads are checked after being taken off the bottles or cylinders. The inspectors do not verify the weighing procedures or check the charge in the bottles. Portable hose and reel equipment is left to the inspector to check on his own or to accept the service company's statement of work done as presented to the ship owner by the service company. Although taught at the Merchant Marine Safety School, there is a need to reemphasize proper inspection procedure to the Coast Guard inspectors. One-time instruction is not sufficient for such critical equipment inspections. If the inspector were given a more specific guide for these systems, he probably would be more inclined to conduct a more thorough inspection. This type of guide for firefighting equipment could be similar to the material available for inspection of lifeboats and other lifesaving equipment. 3/ *The Safety Board concurs* in the recommendation of the Marine Board and the action by the Commandant to publish a one-time reminder to the field inspectors, but believes that a permanent guide is also necessary.

Role of the Master in Decisionmaking in Critical Situations

After power was terminated and the threat of additional fire damage had been removed, the TRANSHURON was without propulsion and vulnerable to grounding or to storm damage.

After he assessed the damage the master sent an urgent message to the company located in New York; the message described the damage and requested tug assistance. The Marine Board's report documents the ensuing delays encountered. Of major safety importance, however, was the master's reluctance to seek or to accept offers of assistance. Since the position of the vessel at the time of the fire gave the master no indication of future problems and since he expected a timely response to the first urgent message, his initial reluctance can be rationalized. However, when time became a critical factor, there were many indications that the master should have sought help.

The first indication came about 16 hours after the fire when Cochin Radio informed the TRANSHURON's radio operator that all messages were forwarded on a routine, first-in, first-out basis. Thus, the "urgent priority" did not expedite the message. The second indication that independent action should be taken was in the reply from the company, which arrived at the ship 31 hours after the original message had been sent. The reply did not indicate that the tug assistance was being sought.

3/ Navigation and Vessel Inspection Circular 2-63, subject: Guide for Inspection and Repair of Lifesaving Equipment.

The drift course of 146° T. at approximately 1.5 kn had been established. Had the master simply extended this line through reported fixes obtained by the navigator, he would have seen that the track of the TRANSHURON was through or near Kiltan Island. By midnight of 25 September, most fixes confirmed that Kiltan Island was a threat to the vessel.

Three vessels which came close to the TRANSHURON offered aid and provided information on navigational fixes. At 0700, on 26 September, Kiltan Island was visible from the TRANSHURON and bearings to the Island were within 1° or 2° of the trackline. Even as late as 0811 on 26 September, the master again asked the company for assistance, even though a response could be delayed as much as 30 hours and the Island was less than 15 miles away. Since the bearing to the Island had not changed, at 1100, the master instructed the radio operator to transmit "immediate danger" and "distress" messages to all ships. Since the "immediate danger" message did not indicate that any vessels were close enough to assist, the radio operator sent the distress message by activating the autoalarm which contacted vessels that did not have operators on watch at the time of the "immediate danger" broadcast. One vessel, the TOSHIMA MARU, was close enough to respond.

The Safety Board cannot reconcile the master's reluctance to seek aid other than from the company. Since the record and his actions give no indication of his reasoning, the Safety Board sought to determine if a general body of commonly known salvage rules could have influenced his reasoning. 5/

The master has full responsibility for the safety of his vessel, its cargo, and its crew. No one can force upon him the services of a salvor. The plight of the TRANSHURON after the fire should have been easily recognized and the need for assistance obvious. Such assistance was offered, but the master chose to allow the vessel to drift to a point of immediate danger before aid was summoned. The Safety Board believes that his reluctance to accept assistance may possibly have been motivated by his desire to avoid high salvage claims not inherent in company negotiated salvage contracts with salvage tugs. 6/

The Safety Board believes that the master relinquished too much of his authority and responsiblity to the company when he did not use all available navigational information and allowed his vessel to drift, in need of help, until it grounded at Kiltan Island. Evidence indicates that the master was waiting for someone to instruct him to take action. This company's practice may have been to require decisionmaking to come from New York. If this were the case, the communications system employed

5/ The Law of Salvage, Martin J. Norris, Baker, Voorhis & Co. Inc., 1958, Mount Kisco, New York. Law of Tug, Tow and Pilotage, Alex L. Parks, J.D., Cornell Maritime Press, Inc., 1971, Chapter XII, Cambridge, Massachusetts.

6/ The Law of Salvage op cit p. 40, para. 27.

makes this management procedure impractical. The use of ship-to-shore stations for message transmission by radio operators or teletype introduced unplanned delays not recognized by the company. The Safety Board believes that there is a need to return to the master the authority to obtain assistance when he alone has the responsibility for the safety of the vessel.

The TOSHIMA MARU arrived at the TRANSHURON about 1600; it had been estimated that the TRANSHURON would reach Kiltan Island at 1800. The starboard anchor was secured, the anchor chain was detached, and the chain was made ready to be attached to the towline. The port anchor was not prepared for use; the master did not want to interfere with the tow by having to retrieve or to work with the port anchor. When the TOSHIMA MARU first attempted to rescue the TRANSHURON, both vessels were about 600 yards seaward of the 100-fathom curve off Kiltan Island. When the second tow attempt was executed, the TRANSHURON was just seaward of the 100-fathom curve. The TOSHIMA MARU's approach was not successful, and in the next 25 minutes, the depth changed from 100 fathoms to 6 fathoms, and the distance traveled was about 1,700 feet. Had the fathometer been operable, the TRANSHURON's bridge crew would have known to drop the port anchor and stop the vessel's movement toward the shore.

Sailing Direction H.O. 63 indicates an open anchoring area off the northwest end of Kiltan Island just off the bow of the TRANSHURON. In his testimony, the master did not indicate that he considered this information when he analyzed the courses of action open to him. Since the fathometer was inoperative, the master should have relied more heavily on the information available in the Sailing Directions.

The communication problem that caused the delay in decisionmaking while the vessel was drifting toward Kiltan Island has been correctly referred to the Federal Communications Commission. The Safety Board notes that a solution to this problem is truly in keeping with the advanced technology of our world. The recently launched MARISAT marine communications system satellite provides this solution. The receivers and associated equipment are now available and in use on commercial vessels. The equipment and service are provided by COMSAT General.

Maintenance of Navigational Equipment on Merchant Vessels

The failure of electronic equipment, such as radars and fathometer, was an integral part of this casualty. The loss of the radar a day before the fire deprived the master of the ability to fix his position during the drift and establish the collision course with Kiltan Island much earlier. This failure could not have been repaired until the next port because the crew had not been trained to fix it.

The vessel was required by regulation (46 CFR 32.15-10) to have a mechanical or electronic deep-sea, sounding apparatus. The TRANSHURON was plagued with a long-standing deficiency of erratic or nonfunctioning fathometer. A fathometer would have provided the information of the shoaling and possibly prompted the master to anchor. Although the fathometer functioned while at the pier, that test is only an indication that the recorder works and does not show that accurate information is obtained while the vessel is operating. The master should have informed the inspector during the periodic inspections of such malfunctions in order to insure proper completion of requested repairs. The law states that the inspector must not divulge the source of information concerning faulty equipment or improper operation. 7/ This feature should be used to the advantage of both master and inspector. The master has a duty to keep the vessel in compliance with the regulations; the inspector has the duty to insure that compliance is maintained, using every legal means at his disposal.

The Safety Board recognized this problem in the loss of the SS STEEL VENDOR on 7 October 1971 and recommended that the Coast Guard publicize to the maritime industry the importance of 46 USC 234. This was done through an article published in the Merchant Marine Council Proceedings which is widely circulated in the industry. Events in the loss of the TRANSHURON indicate that there is a continuing need to publicize to masters and inspectors their responsibilities in the maintenance of safe merchant vessels.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of the accident was the loss of power by the SS TRANSHURON which resulted in the grounding of the vessel on Kiltan Island reef.

Contributing to the accident were the rendering inoperative of the vessel's propulsion switchboard by a fire, caused by the failure of the iron pipe nipple in the bronze condenser head, the reluctance of the master of the SS TRANSHURON to accept offers of aid from other vessels, and his failure to use available information in order to anchor prior to the grounding of the vessel on Kiltan Island.

7/ 46 USC 234 - No Coast Guard official receiving information from a licensed officer who is employed on any vessel as to the defects in such vessel, or the equipment, boilers, or machinery, or that any provisions of Title 52 of the Revised Statutes is being violated shall impart the name of such licensed officer, or the source of his information to any person other than his superior in the Coast Guard. Any Coast Guard official violating this provision shall be subject to dismissal from the service.

As a result of its analysis of this casualty, the National Transportation Safety Board recommends . . . that the Commandant, U.S. Coast Guard:

"Insure that required specifications and plan-approved documents for ship modification are transmitted to the inspectors before equipment is installed or construction and modification is begun. (Class II -- Priority Followup) (M-76-20)

"Expedite the issuance of regulations to require spray shield protection when saltwater piping must be in the vicinity of switchboards or other open electrical equipment. (Class II -- Priority Followup) (M-76-21)

"Expand either the Merchant Marine Safety Manual or other suitable instructions to include aids for inspection and repair of fire-fighting equipment, particularly CO_2 semi-portable equipment. (Class II -- Priority Followup) (M-76-22)

"Continue to disseminate to Coast Guard inspectors and licensed Merchant Marine officers the information that all concerned are responsible for the compliance of any vessel with the regulations and that this responsibility is found in and protected by law and regulations. (Class II -- Priority Followup) (M-76-23)

"Include in the engineers' license examination, questions on all phases of damage control and engineering casualty control for various powerplants in addition to the existing firefighting and emergency equipment qestions." (Class III -- Longer Term Followup) (M-76-24)

- - - that the Office of Maritime Affairs, Department of State:

"Introduce before IMCO a suitable resolution to reaffirm that masters are responsible to call for assistance based upon the immediate casualty situation and are not to depend solely on company arrangements or assume responsibility for potential salvage claims." (Class II -- Priority Followup) (M-76-25)

- - - that the Maritime Administration, Department of Commerce:

"Urge shipowners to install communications equipment to use MARISAT communications satellites. (Class II -- Priority Followup) (M-76-26)

"Issue an advisory to restate the master's responsibility to call for assistance based upon the immediate casualty situation and to urge owners and operators to develop procedures and informational guides to assist masters and inform management personnel of potential communications and logistics problems." (Class II -- Priority Followup) (M-76-27)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ WEBSTER B. TODD, JR.
Chairman

/s/ KAY BAILEY
Vice Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ WILLIAM R. HALEY
Member

PHILIP A. HOGUE, Member, did not participate in the adoption of this report.

September 16, 1976

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

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5943/TRANSHURON

30 MAR 1976

Commandant's Action

on

The Marine Board of Investigation convened to investigate circumstances surrounding the stranding of the SS TRANSHURON at Kiltan Island on 26 September 1974 without loss of life

1. The record of the Marine Board of Investigation convened to investigate subject casualty has been reviewed; and the record, including the Findings of Fact, Conclusions, and Recommendations, is approved subject to the following comments.

REMARKS

1. On 24 September 1974 an extensive fire in the main propulsion switchboard of the SS TRANSHURON resulted in the loss of all propulsion power. The vessel drifted for approximately 63 hours and stranded on Kiltan Island on 26 September 1974. The cause of this casualty was the failure of a black iron pipe nipple gage connection on the waterside of a freon condenser of the air conditioning machinery. The union between the black iron nipple and the cast bronze condenser created an electrolytic action in a salt water environment that was not adequately compensated for. If the failure of this nipple had not occurred, the primary link in the resulting chain of events would have been eliminated.

2. In addition to the Board's report and the record of proceedings, Westinghouse Instruction Book (6893) (Rev. 1), for Turbine Electric Propulsion on T2 Tankers was consulted. This operating manual is for the original equipment on board this class vessel. The SS TRANSHURON was built twenty nine years prior to the casualty and was later rebuilt, therefore the existing installation may have had minor differences not described, however, major components or equivalent equipment is believed to have existed on board the SS TRANSHURON at the time of the casualty.

3. The primary element in combating an electrical fire is to deenergize the affected circuit. In this case the source of the electricity was the excitation for the fields of the main generator and main motor. There are five methods normally available whereby engineering personnel could have secured the excitation for the fields of the main generator and main motor thereby deenergizing the flow of electricity to the main propulsion control panel. These methods are (1) place the speed control lever or emergency speed control lever in the low speed position and then place the starting control lever in the off position; (2) depress the excitation selector switch interlock lever and turn the hand wheel to the neutral position; (3) open the field disconnect switch for the on-line 110 KW generator; (4) secure the throttle valve or emergency trip for the on-line auxiliary generator; (5) open the electrically interlocked access door behind the main switchboard with the electrical bypass not in use. None of these methods were effectively employed in time to prevent irreparable damage.

COMMENTS ON CONCLUSIONS

1. The conclusion that the failure of the TOSHIMA MARU's line throwing gear and the actions on the part of the TOSHIMA MARU after firing their line throwing gun contributed to the cause of the casualty are not concurred with. There is insufficient evidence to support the implication of contributory cause.

2. With regard to conclusion 3a it must also be noted that in addition to the engineering watch and the chief engineer, the first assistant engineer failed in his attempts to deenergize the main propulsion control panel upon his arrival. The prolonged delay in securing excitation to the main propulsion cubicle significantly contributed to the extent of damage.

3. The conclusion that the original installation of the air conditioning unit was not in compliance with existing regulations is not concurred with. Title 46 CFR 56.50-1(d) states that piping shall not be run over or in the vicinity of switchboards or other electrical equipment if avoidable. In this instance the piping run was installed on the flat below the switchboard and therefore was not "in the vicinity" and not prohibited by regulations. The intent of this regulation was to minimize the possibility of water damage to electrical switchboards or equipment caused by drippage from small water leaks. This regulation was not meant to prevent damages from total failures of piping or fittings as was the case in this casualty.

4. It is further concluded that:

a. There is evidence of negligence on the part of the Third Assistant Engineer, Federico Sanchez, in that he failed to notify the bridge watch of the fire, failed to ring the general alarm bell, failed to take any action to secure the excitation to the field of the main generator and main motor and failed to take any action to fight the fire.

b. There is evidence of negligence on the part of the First Assistant Engineer, Robert Poore, and Chief Engineer, Ward Peters in that they failed to secure the excitation to the field of the main generator and main motor in a sufficient amount of time to prevent the near total destruction of the main propulsion cubicle.

c. There is evidence that the action on the part of the Master, Constaninos D. Papalios, by permitting his vessel to drift without propulsion for 63 hours into a vicinity of small islands, amounted to gross negligence and a complete disregard for the safety of his vessel and crew. No action was taken to insure the safety of the vessel and crew by requesting assistance from the numerous vessels offering support which were in the area, even though the master had no positive assurance that the tug he requested from the operating company was enroute until after the grounding occurred. Assistance was sought by the master only after there was insufficient time to allow for a safe and timely rescue. There is also evidence of negligence on the part of the master in that he failed to adequately supervise the launching of the No. 3 lifeboat.

d. There is no evidence that Coast Guard personnel or any representative or employee of any other government agency or any other person contributed to the cause of this casualty.

ACTION CONCERNING THE RECOMMENDATIONS

1. The recommendation that this report be given immediate dissemination in the marine field prior to formal release of the report is concurred with. A synopsis of this report will be published in the Proceedings of the Marine Safety Council.

2. The recommendation that the masters of vessels emphasize knowledge of the operation of firefighting, lifesaving, and all other emergency equipment during drills is concurred with. Regulations that require this conduct on the part of the master are contained in 46 CFR 35.10, 46 CFR 78.17-50, and 46 CFR 97.15-35.

3. The recommendation that Coast Guard personnel, as a part of the routine inspection procedure, insure that crew members indicate knowledge of the proper operation of installed firefighting systems is concurred with. An integral part of vessel inspection is the witnessing of fire drills conducted by the crew and test of firefighting equipment. Additionally exams for licensing and certification are being expanded to include additional questions on firefighting and emergency equipment.

4. The recommendation that the Coast Guard give consideration to amending applicable regulations to require that hoses of semi-portable CO_2 fire extinguishers be tested at the time of each inspection for certification has been considered. Regulation changes will be proposed which will require hoses on semi-portable CO_2 systems to be periodically tested or replaced. Also an article was submitted for publication in the Commandant's Bulletin intended to alert field units to the possible dangers of hose failures on these systems.

5. The recommendation that the regulations in 46 CFR 111.30-1(c) be amended to include a requirement for the shielding of switchboard openings at the base and sides, in addition to the existing requirements for a drip-cover over the top is concurred with. A regulation change will be proposed to require the shielding of switchboards from the top, bottom and sides to provide protection from accidental spillage or piping failures.

6. The recommendation that the Coast Guard conduct a survey of the establishments that service inflatable liferafts is concurred with. Information concerning sea painter deterioration and bridle to painter connections as well as vandalism will be solicited. This information will be evaluated and if changes are needed appropriate action will be taken.

7. The recommendation that further investigation be conducted concerning the violation of regulations relative to the air conditioning unit's installation, including circumstances which permitted the installation is not concurred with. There is no evidence to support the conclusion that the original installation of the air conditioning unit was in violation of regulations.

8. The following additional action will be taken:

a. A separate investigation under Suspension and Revocation Proceedings will be initiated with regard to the actions of the Master, Constaninos D. Papalios, the Chief Engineer, Ward Peters, the First Assistant Engineer, Robert Poore, and the Third Assistant Engineer, Federico Sanchez during the events which led to this casualty.

b. A copy of this report will be sent to the Federal Communications Commission for their consideration regarding the delays relative to the handling of urgent message traffic.

O. W. SILER

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE:

G-MVI-3/83

5943/TRANSHURON
MARINE BOARD
3 June 1975

From: Marine Board of Investigation
To : Commandant (G-MVI)

Subj: SS TRANSHURON, O.N. 506349; Stranding at Kiltan Island on 26 September 1974, without loss of life

FINDINGS OF FACT

1. At about 0315 local time on 24 September 1974, a fire started in the main propulsion control cubicle of the main switchboard of the SS TRANSHURON, while the vessel was underway in the Arabian Sea bound from Bahrain, Persian Gulf to Subic Bay, Philippine Islands with a cargo of Navy Special fuel oil. The fire resulted in a complete loss of propulsion power and the vessel drifted until about 1812 on 26 September 1974, when it grounded on a reef at Kiltan Island off the southwest coast of India. Twenty-eight crew members abandoned ship by lifeboat and landed on Kiltan Island, whence they were transferred to the mainland by the India navy. The Master and four officers remained aboard until 29 September 1974 when, with the vessel hard aground and leaking oil from numerous ruptured tanks, they abandoned ship and were transported to the mainland by a commercial towing vessel. There was no loss of life or injury.

2. Description of vessel involved:

Name:	SS TRANSHURON
Official Number:	506349
Year Built:	1945, Rebuilt 1966
Service:	Tankship, T-2
Gross Tons:	11,971
Net Tons:	8,449
Length:	546.97'
Breadth:	75.19'
Depth:	39.10'
Propulsion:	Steam Turbo Electric
Horsepower:	6,000
Home Port:	New York, N. Y.
Owner:	United States of America, represented by the Secretary of Commerce, acting through the Assistant Secretary of Commerce for Maritime Affairs, Washington, D.C., 20235.

Operator:	Hudson Waterways Corporation One Chase Manhattan Plaza New York, N.Y., 10005.
Master:	Constantinos D. Papalios License No. 401474, Issue 4-4 USMMD Z-759 535
Last USCG Inspection:	Biennial, 17 May 1974, San Francisco, California.
Last ABS Inspection:	May 1974 (7th Special Survey)
Capacity:	167,665 bbls, Grade "B"

3. The weather at the time of the grounding was clear, with good visibility, wind from northwest at Force 6 and gusty, a rough northwesterly sea and a heavy northwesterly swell, approximately eight feet in height.

4. The vessel's radar, fathometer and gyrocompass were inoperative at the time of the grounding. The fathometer had become inoperative about the first of September and the radar on 19 September, the day after leaving Bahrain. The gyrocompass had been out of service since the time of the main propulsion control fire on 24 September.

5. At the time of the casualty the SS TRANSHURON was on charter to Military Sealift Command and was loaded with 117,251 barrels of Navy Special fuel oil owned by the United States Government and consigned to the U. S. Department of Defense at Subic Bay, Philippine Islands. Draft of the vessel at the time of the casualty was approximately 27' 02" forward, and 31' 09" aft.

6. The main propulsion plant of the SS TRANSHURON is steam turbo-electric, manufactured by Westinghouse Electric Corp. The main switchboard is installed athwartships, with the auxiliary generator control components and the distribution panels on the starboard side and the cubicle for the main propulsion control desk on the extreme port side. Next to the propulsion control desk, to the right, is the cargo pump control panel. At the usual full sea speed of 86 RPM, the voltage in the main propulsion circuit would be 2200, and the current approximately 1000 amperes A.C.

7. The main propulsion control desk has three levers. The starting lever controls the direction of rotation and the speed-control lever operates the turbine-governor control, varying the amount of steam to the main generator turbine. An emergency speed-control lever is located to the right of the speed lever. Its purpose is to control the steam flow irrespective of the

governor setting, and to limit it if operating conditions require. During heavy storm conditions it may be desirable to adjust this lever in order to prevent fluctuation of steam demand from the boilers.

8. Excitation for the fields of the main generator and main motor is provided by generator units on the auxiliary generator sets. An excitation selector switch on the control desk determines whether excitation is obtained from the port or starboard bus and exciter. This switch includes a small interlock lever adjacent to the switch handwheel which has to be depressed and thus causes the field breaker to be tripped before the handwheel can be moved.

9. The main propulsion control circuit may be de-energized by any of the following methods: operate the speed and starting control levers, depress the excitation selector switch interlock lever, or operate the emergency trip lever shutting off steam to the main generator turbine. The emergency trip lever is located at the control desk.

10. At about 0315 on 24 September 1974, the engineer on watch, Third Assistant Engineer Fredrico Sanchez, Z-636 228, Second Engineer's License #416714, smelled something burning as he was returning to the main control flat after making an inspection round. As he was looking for the source he heard a series of sounds like explosions and then saw flashes and fire behind the main propulsion control desk. He started toward the controls, but the flashes and fire were coming from under the control levers and he was afraid of getting burned. Although he made no attempt to activate the general alarm, he did try to contact the Chief Engineer by telephone but got no answer. There is no phone in the First Assistant Engineer's room, so Sanchez ran up and knocked on his door. When informed that there was fire in the engineroom, First Assistant Engineer Robert E. Poore, BK-306 879, First Engineer's License #439452, immediately dressed and went to the engineroom. He had to go via the steering engineroom and the fireroom, because of heavy smoke in the upper engineroom. On his way back, Sanchez checked the Chief Engineer's room, but the Chief was not there.

11. At about 0315 on 24 September 1974, Chief Engineer Ward L. Peters, Z-881 610, Chief Engineer's License #427918, was awakened by the ringing of the telephone in his room. He answered the phone but there was no response. He then smelled smoke so he put on a pair of trousers and shoes, and went from his room to the engineroom door. He opened the door but could

not enter due to dense smoke, so he went below and got to the engineroom via the steering engineroom and the fireroom.

12. The Chief Engineer found flames and dense smoke at the main propulsion desk. He moved the speed-control lever to idling speed and then tried to bring the starting lever to the "off" position, but it would not move. No attempt was made to de-energize the propulsion control desk by any of the alternate means available. He then left the engineroom to activate the CO^2 fire-fighting system at the control station in the port passageway at the main deck level. This station controls a bank of seven 50-lb., cylinders of CO^2. A valved manifold directs CO^2 via branch lines to the "main switchboard" (main propulsion control desk), cargo pump cubicle, main generator and main motor. The directional valves are manually lever-operated, and are opened by swinging the lever counter-clockwise from right to left. A cable pull located to the right of the manifold will discharge one cylinder through any or all branch lines, depending on which directional valves are open. A cable pull located to the left of the manifold will discharge the remaining six bottles through whichever branch lines are open. Also, if the left cable pull is actuated first, all seven bottles will be discharged simultaneously. Immediately to the left of this station is the "aft engineroom and forward engineroom" CO^2 station, including two glass covered pull box releases. There was no indication that CO^2 was being discharged when the Chief Engineer attempted to activate the system. The Board could not determine if the system had been properly operated.

13. At about the time the Chief Engineer was operating the CO^2 controls, First Assistant Poore appeared on the scene and they both went to the engineroom and found the fire still in progress. The Chief Engineer then ordered the semiportable CO^2 unit placed in operation. This unit is located in the fireroom and consists of two 50-lb., CO^2 cylinders and a length of hose on a reel. There is a shut-off valve at the end of the hose with a horn-shaped nozzle attached to the valve. Arthur Baredian, Z-1 261 437, the oiler on watch, ran the hose into the engineroom where it was taken by Poore to the vicinity of the switchboard. Poore called to Baredian to operate the cylinder discharge control. Baredian operated the control, the hose burst in way of its connection to the shut-off valve at the horn and the horn separated from its threaded connection at the valve and blew off. When the hose burst it began to whip and Poore fell backwards and lost his grip on the valve. The hose whipped about until the CO^2 discharge ceased while Poore stayed down for safety. Also, at this time the main propulsion control desk was still energized.

14. It was then decided to fight the fire with portable 15-lb., CO^2 extinguishers. Crew members who had arrived on scene were directed to pick up CO^2 extinguishers from other parts of the vessel and bring them to the engineroom. It was then decided that for the safety of personnel going behind the switchboard to fight the fire, the board should be completely de-energized by securing the auxiliary generator and therefore shutting down the plant. This was done, and the emergency generator was started at 0345, to provide lighting through the emergency circuits. Mr. Poore and Third Assistant Engineer Earl W. Cochran, Z-1 236 972, Third Engineer's License #431076, then went behind the switchboard and extinguished the fire with the portable CO^2 fire extinguishers.

15. Immediately after the fire was extinguished, the Chief Engineer surveyed the damage and decided that the propulsion control unit was completely destroyed, and that there was no possibility of affecting emergency repairs in order to make the main propulsion unit operable. He reported this to the Master, Constaninos Papalios, Z-759 535, Master's License #401474. At 0520, a radio message was sent to the vessel operators, Hudson Waterways Corp., as follows:

"URGENT SHIPTRAMP
NEW YORK

"URGENT FIRE HAS DESTROYED 2300 VAC CONTROL BUSS STOP SHIP NOT OPERABLE CHIEF ENGINEER NOTIFIES MASTER TO REQUEST TUG ASSISTANCE IMMEDIATELY STOP POSITION BY DR 12-41N 72-09E 232215Z COLOMBO 530 MILES PLEASE ADVISE IMMEDIATELY VIA RADIO COCHIN/VWN.

MASTER"

The message was sent via the coastal radio station at Cochin, India.

16. After the fire, at about 0430, Poore went to the lower engineroom to secure some valves and noticed a stream of water shooting straight up from the air conditioning plant, which is located on a flat below the main switchboard. The water was coming from a threaded hole in the top of the cooling water header of the freon condenser and was going up against the overhead, which is the deck of the main switchboard. He then noted that the pipe nipple and pressure gage that had been connected to that opening in the header, had apparently broken off. The assembly was lying on top of the header. Poore shut the appropriate valves in the cooling water system and the flow of water from the opening ceased.

17. Examination of the nipple indicated that it was a standard 3/8" x 4" pipe nipple, of ferrous material identified as black iron. A pressure gage was screwed onto the threads at one end. The threaded portion of the opposite end of the nipple had wasted away completely, except for a portion of one thread. The inside of the nipple was fouled with heavy corrosion. The header to which the gage assembly had been attached was made of non-ferrous material, identified as cast bronze. The location of the gage connection was directly under the propulsion control desk, and in line with an opening in the switchboard deck through which the main propulsion cables pass. The deck is approximately six feet above the gage connection. Poore replaced the wasted nipple with a brass nipple, and reinstalled the pressure gage.

18. In December 1966, the SS TRANSHURON was rebuilt by the American Shipbuilding Co., of Lorain, Ohio. In conjunction with the hull modifications, the vessel's centralized air conditioning system was installed, with the primary unit being located on the machinery flat directly below the main propulsion desk. At the time of the installation of this system, Title 46 CFR, Part 56.50-1(d) was in effect. This part concerns precautions taken with piping installations in the vicinity of switchboards or other electrical equipment:

> "Piping shall not be run over or in the vicinity of switchboards or other electrical equipment if avoidable. When such leads are necessary, welded joints only shall be used and provision shall be made to prevent leakage from damaging the equipment."

This regulation, as worded, became effective in 1956.

19. At 1050, the auxiliary plant and No. 2 auxiliary generator were placed in operation and all services, with the exception of main propulsion, were restored.

20. The Second Mate, George R. Posey, Z-224 182-D2, Chief Mate's License #397419, got a star fix during his 0400-to-0800 watch on 24 September, which indicated the vessel's position as 12-36N, 72-10E. At 0732, this information was sent by radio message to Hudson Waterways. Deck and engineering watches were maintained as the vessel drifted in a southeasterly direction. The vessel's position was checked frequently by celestial navigation, and it was verified from information provided by other vessels passing in the vicinity. Offers of assistance from passing vessels were declined.

21. At 0912, on 24 September, the following radio message with amplifying information concerning the propulsion casualty was sent to Hudson Waterways:

"URGENT SHIPTRAMP
NEW YORK

"REFER WESTINGHOUSE INSTRUCTION BOOK 8345 PART FIVE PAGES 502 503 AND 512 FIGURES PC-1 PC-2 CPC-1 AND CPC-2 STOP WESTINGHOUSE PROPULSION CONTROL DESK AND PUMP-MOTOR POWER SUPPLY CONTROL UNIT COMPLETELY DESTROYED STOP FIRE CAUSED BY PLUG BLOWING OUT OF THE AIR CONDITIONING CONDENSER DIRECTLY BELOW THE 2300 VAC CONTROL DESK.

MASTER"

22. The following messages were also sent to Hudson Waterways, at the times indicated:

"1252 24 SEPT
URGENT SHIPTRAMP
NEW YORK

"NOON POSITION 240705Z 12-27N 72-21E SINCE LAST STARS MESSAGE HAVE DRIFTED 14 MILES 2.3 MPH COURSE 129 WEATHER NWLY 6 SWELL 7 FEET WILL KEEP YOU INFORMED URGENTLY REQUEST ADVICE

MASTER"

"1938 24 SEPT
URGENT SHIPTRAMP
NEW YORK

"241400Z DR 12-18N 72-32E NO SUN NO STARS ESTIMATE DRIFTED 14 MILES SINCE NOON STOP WIND NW 7 SEA NW 8 FEET SWELL NW 10 FEET

MASTER"

"0905 25 SEPT
SHIPTRAMP
NEW YORK

"URGENT 250300Z DR 12-02N 072-35E DRIFTING 146 TRUE TWO KTS WIND NW 6 SEA NW ROUGH SWELL NNW HEAVY 10 FEET

"FREQUENT RAIN SQUALLS WITH REDUCED VISIBILITY STOP
APPROX 23 MILES NORTH CHETLAT ISLAND

MASTER"

"1012 25 SEPT
SHIPTRAMP
NEW YORK

"URGENT CORRECTED 250410Z POSITION 12-06N 072-35E
DRIFTING 146 TRUE 1.4 KTS WIND NW 6 SEA NW ROUGH SWELL
NNW HEAVY 10 FEET FREQUENT RAIN SQUALLS WITH REDUCED
VISIBILITY STOP APPROX 25 MILES NW CHETLAT ISLAND

MASTER"

On 25 September the vessel's radio operator, Frank W. Roach, Z-30 688-D4, *Radio Operator's License* R-9435, was advised by the operator at Cochin that India did not give special priority to messages classed "Urgent." They were relayed along with regular traffic. He omitted the word "urgent" from subsequent messages, but kept it in the text in the hope that it would serve to alert the people who handle incoming messages at Hudson Waterways.

23. At 1600, 25 September, the following message was received from Hudson Waterways:

"MSG NR 1 NEWYORK CK 106 24 1155
MASTER
TRANSHURON WGUN COCHIN RADIO/VWN

"KEEP ADVISED YOUR POSITION STOP CAN POSSIBLE EMERGENCY
REPAIRS BE MADE STOP DID SALT/WATER AIR CONDITION CON-
DENSER CAUSE FIRE STOP DID CONTROL DESK CUBICLE SHORT
AND BLOW OUT WHAT PARTS STOP DID CONTROL DESK CUBICLE
PARTS AND WIRING BURN WITH FIRE AND FOR HOW LONG STOP
WAS COTWO USED TO PUT OUT FIRE STOP REQUIRE DETAILS AS
POSSIBLE ON DAMAGE TO PARTS WIRING AND BUSS BARS STOP
ADVISE IF DAMAGED PARTS AND WIRING CAN BE REPAIRED OR
PARTIALLY RENEWED OR IF COMPLETE REPLACEMENT CONTROL
DESK CUBICLE PANELS IF REQUIRED STOP ANSWER IMMEDIATEL Y
AND START MESSAGE WITH URGENT.

SHIPTRAMP"

24. Following receipt of the above, the following messages were went to Hudson Waterways, on 25 September:

"1645 25 SEPT
SHIPTRAMP
NEW YORK

"BOMBAY FCC DISALLOWS MY SENDING URGENT MESSAGES STOP POSITION 251030Z 12-01N 72-41E REUR 25TH ANSWER FOLLOWS STOP FIFTH MESSAGE SINCE BREAKDOWN REQUIRE ASSISTANCE.

MASTER"

"1835 25 SEPT
SHIPTRAMP
NEW YORK

"URGENT EMERGENCY REPAIRS IMPOSSIBLE STOP NIPPLE BLOWOUT ON TOP OF AIR CONDITIONING CONDENSER CAUSED SALT WATER TO ENTER THRU BOTTOM OF PROPULSION CONTROL DESK STOP CONTROL DESK CUBICLE SHORTED AND BURNED FOR APPROXIMATELY ONE HOUR FIVE MINUTES BEFORE BEING EXTINGUISHED BY PORTABLE CARBON DIOXIDE FIRE EXTINGUISHERS STOP REFER ORIGINAL MESSAGE WESTINGHOUSE PROPULSION CONTROL DESK AND PUMP MOTOR POWER SUPPLY CONTROL UNIT COMPLETELY DESTROYED STOP ALL WIRE BUSS BARS CONTACTORS METERS RELAYS TRANSFORMERS HOLDING COILS ETC DESTROYED STOP STARBOARD BOILER AND OUTBOARD AUXILIARY GENERATOR FURNISHING LIGHT AND POWER STOP NO INJURIES.

MASTER"

25. At about 0000, 26 September 1974, communications were established with a passing Norwegian tanker, TEXACO BRITTANIA, which advised that their position was 11°47.5'N, 72°47.5E, with Chetlat Island bearing 220°T., at 7.7 miles. At daybreak Kiltan Island was sighted, cross-bearings were taken, and at 0620 the vessel's position was plotted as 11°42'N, 72°50'E, with Chetlat Island bearing 269°, at 8-miles, and Kiltan Island bearing 144°T., at 15 miles. The vessel was drifting 154°T., at 1.5 knots. At 0811, the following message was sent:

"0811 26 SEPT
SHIPTRAMP
NEW YORK

"URGENT 260120Z POSITION 11-42N 072-50E DRIFTING 154 TRUE SPEED 1.5 KTS STOP CHETLAT ISLAND 269 TRUE 8 MILES OFF STOP KILTAN ISLAND 144 TRUE 15 MILES WIND NW6 SWELL 8 FEET REQUIRE IMMEDIATELY RESPONSE FROM YOU OR WILL TAKE PERSONAL ACTION.

MASTER"

26. At 0730, 26 September, the vessel's position was plotted as 11°39'N, 72°54'E. Bearings on Kiltan Island during the three hours following indicated little change, and at approximately 1100, the Master ordered the Radio Officer to transmit an urgent "XXX" signal. The following message was transmitted at 1103:

"XXX XXX XXX URGENT MESSAGE - TO ALL SHIPS

"URGENT SS TRANSHURON /WGUN TANKER LOADED DIESEL OIL ADRIFT X ANY VESSEL WITHIN 50 MILES OF POSITION 260600Z 11-35N 72-57E ANSWER GIVING YOUR POSITION X BEARING 325 TRUE FROM KILTAN ISLAND APPROX SIX MILES DEAD SHIP REQUIRE TOW.

MASTER"

The message was acknowledged immediately by about 15 vessels. Two of the vessels were about 110 miles distant. The remainder were at various distances from 500-to-600 miles. One of the nearer vessels, the SS ANTILLA BAY, advised that she was proceeding to TRANSHURON's position at 15 knots. The "urgent" message was also repeatedly broadcast by bridge personnel over the VHF radio, Channel 16, but there was no response. At 1145 the following message was sent:

"URGENT SHIPTRAMP
NEW YORK

"260600Z POSITION 11-35N 72-57E DRIFTING DOWN ON KILTAN ISLAND NOW APPROX SIX MILES OFF BEARING 335 STOP BEARING UNCHANGED SINCE LAST MESSAGE ANCHORING GROUND BY CHART UNKNOWN SAILING DIRECTIONS GIVE SHOAL REEFS ONLY STOP DECISION MADE TO CALL FOR SHIP ASSISTANCE.

MASTER"

27. Due to the vessel's continuous drifting toward Kiltan Island and its proximity to same, the Master decided to send an "All Ships" distress message. At 1245, the Radio Operator actuated the auto-alarm and then transmitted the following message:

"'DISTRESS MESSAGE' - TO ALL SHIPS

"SS TRANSHURON /WGUN LOADED TANKER CARGO DIESEL OIL
ADRIFT REQUIRE TOW IMMEDIATELY POSITION 11-34N 72-57E
260700Z BEARING 325 APPROX FOUR MILES FROM KILTAN ISLAND
ANY VESSEL WITHIN 50 MILES PLEASE ACKNOWLEDGE.

MASTER"

Numerous ships and shore stations replied. The Radio Operator collected "ship position data" and submitted it to the Master, who selected the nearest vessel, the SS TOSHIMA MARU, which was about 45 miles away. The TOSHIMA MARU advised that she would arrive in TRANSHURON's position at 1600. The other vessels were dismissed. At about 1430, radio/voice contact was established on VHF, Channel 16, and at about 1500, TOSHIMA MARU advised that they had a solid radar contact with TRANSHURON.

28. During the afternoon, the TRANSHURON crew unshipped the starboard anchor in preparation for using the anchor chain in a tow line rig. The anchor had been tied off with wire on the previous day. Also, the Lyle gun was broken out and set up on the hatch cover of the dry cargo hold forward.

29. At 1600, TOSHIMA MARU arrived on scene. At that time the TRANSHURON was an estimated 2-miles from Kiltan Island, and drifting down on it portside-to. TOSHIMA MARU maneuvered to approach TRANSHURON from the starboard quarter. At 1702, the TOSHIMA MARU came along TRANSHURON's starboard side, about 200 feet off, and at 1707, fired their line-throwing gun. The shot fell short. TOSHIMA MARU sheared off sharply to the right and increased speed. TOSHIMA MARU advised by radio that the Third Officer had been injured when the gun fired, and they were going to the nearest port to get him to a hospital. The Master of TRANSHURON told the Radio Operator to radio back and hold TOSHIMA MARU by any means, as they were now very close to the island. At about 1728, a message was sent to TOSHIMA MARU requesting a tow for just a mile, in order to clear the island. TOSHIMA MARU repeated that they were going to take the injured man to a hospital. Master of TRANSHURON then sent another message requesting a tow for half-a-mile from the island because the lives of 35 men were at stake; TRANSHURON could then wait for help from another ship. At about 1755, TOSHIMA MARU replied to the effect that they would make one more attempt, and that only to pull TRANSHURON away from the island. They also advised that their line-throwing gun was now broken, so TRANSHURON should send them a line. At about 1758, TRANSHURON replied that they

would immediately make ready to shoot a line from the stern. At that time the Master ordered Chief Mate Allen W. Wood, Z-200 947-D1, Master's License #379922, to shift the Lyle gun to the stern. TOSHIMA MARU began another approach, coming up on TRANSHURON's starboard quarter. As Wood and some crew members were in the process of moving the Lyle gun to the stern, they heard a "crunching" noise as the hull commenced scraping bottom. Wood reported this to the bridge and the Master ordered him to walk out the port anchor. Wood and Boatswain Wallace G. Perry, Z-904 204, returned to the bow, and at 1801 commenced walking the anchor out. At that time the Master of TRANSHURON sent a radio message to TOSHIMA MARU, requesting them to come closer and prepare to receive the line, and advising that TRANSHURON had started touching bottom at 1800. At 1805, a lead-line sounding indicated 6 fathoms in way of #9 Port. An entry was made in the deck log indicating 5 shots of chain at the water's edge and the vessel aground at 1812.

30. TRANSHURON grounded on a heading of 210°T, in position 11° 29.9'N, 72° 59.7'E, off the northwestern point of Kiltan Island, about 500 yards from shore. Depth of water 3/4 miles from shore along the course that TRANSHURON was drifting, is approximately 170 fathoms. During the next 350 yards it shoals to 9 fathoms, and then is 4 and 5 fathoms for the next 500 yards to the position of the stranding. The Master, who had read the description of the steeply sloping reefs of the Laccadive Islands in H.O. 63, Sailing Directions for West Coast of India, elected not to lower the port anchor as the vessel neared the island, for fear of jeopardizing the possibility of being towed clear of the reefs by the TOSHIMA MARU.

31. The vessel was pounding and scraping on the bottom due to the swell, and within a few minutes a large amount of oil appeared on the water in the forward area of the vessel. In the engineroom, water was coming in forward through the top of the cofferdam which is between the engineroom double bottoms and the pumproom. The engineroom was also flooding in way of the after starboard double bottom tanks.

32. As the pounding of the vessel increased there was some concern that it might break up. The Master told Chief Mate Wood to muster the crew and let them decide if they wanted to be put aboard the TOSHIMA MARU, or go to the island. Due to the fact that they would have to contend with heavy sea and swells to get to the TOSHIMA MARU, the crew elected to go ashore. At 1930, #2 and #4 boats were away to Kiltan Island. The Master, Chief Engineer, Chief Mate, First Assistant Engineer and Radio

Operator, remained aboard the vessel. The engineering plant was secured and the emergency generator was supplying power for the emergency circuits. The following message was sent at 2006, 26 September:

"SHIPTRAMP
NEW YORK

"DISTRESS SOS ABANDONED SHIP 261355Z MASTER CHIEF MATE RADIO OPERATOR CHIEF ENGINEER FIRST ENGINEER ABOARD ALL OTHER CREW MEMBERS OFF IN BOATS TO KILTAN ISLAND STOP PLEASE MAKE TRANSPORTATION ARRANGEMENTS STOP ENGINEROOM HOLED TAKING ON WATER BADLY MIDSHIP TANKS GIVE OFF MUCH OIL VESSEL POUNDING STOP ABOVE OFFICERS DISEMBARK IN MORNING 27TH.

MASTER"

33. Both boats made it safely to shore where they were assisted by the inhabitants and quartered in a police complex until the 28th, when they were taken by an India navy vessel to Cochin. At Cochin, they were interviewed by an official of the India Government Mercantile Marine Department, who was conducting an inquiry ordered by the India government. They were then repatriated to the U.S.A.

34. The following messages were sent on 27 September, at the times indicated:

"0740 27 SEPT
SHIPTRAMP
NEW YORK

"URGENT FIVE OFFICERS STILL ABOARD STOP VESSEL LIES ON CORAL REEF OIL CONTINUES ESCAPING FROM VARIOUS TANKS MOST ANXIOUS TO RECEIVE YOUR PLANS ON REPATRIATING CREW ONLY POWER EMERGENCY GENERATOR TWO DAY SUPPLY THEN DEAD SHIP NO COMMUNICATIONS FROM THEN ON AND ISLAND LOOKS DESOLATE STOP YOU MUST COMMUNICATE IMMEDIATELY VIA COCHIN RADIO/VWN.

MASTER"

"1556 27 SEPT
SHIPTRAMP
NEW YORK

"ALL MEMBERS OF CREW UNDER SEMIARREST EXCEPT FIVE OFFICERS WHO REMAINED ABOARD PER MY WIRE 261455Z STOP THEY LEAVE ISLAND ON INDIAN NAVAL VESSEL AT 1800 LOCAL 27TH BOUND FOR COCHIN STOP BEYOND MY POWER TO PREVENT THIS AS LOCAL OFFICALS OBEYING ORDERS FROM HIGHER AUTHORITY STOP SUGGEST YOU CONTACT DEPARTMENT OF STATE STOP NAVY TUG SCHEDULED ALONGSIDE TOMORROW AT DAYLIGHT.

MASTER"

35. At 1750 on 27 September, the following message was received from Hudson Waterways:

"MASTER
TRANSHURON/WGUN

"URGENT TUG CHALLENGER LEAVING BOMBAY EARLY FRIDAY MORNING AND WILL ARRIVE YOUR POSITION WITHIN FORTY-EIGHT HOURS REVERTING WITH TUGS CALLSIGNS ETC STOP SEND YOUR POSITION EVERY 12 HOURS STOP NO OTHER TUG AVAILABLE FROM SINGAPORE TO PERSIAN GULF STOP WE ARE DOING UTMOST EXPEDITE TUG ASSISTANCE.

SHIPTRAMP"

36. On the morning of 28 September an India naval vessel appeared on scene. TRANSHURON was boarded and permission was requested and granted for an underwater survey. Divers surveyed the bottom and at 1130 completed the survey and reported that the vessel was aground at the bow and at the stern, and that there was a continuous crack from #2 to #8, alongside the keel. The naval commander in charge stated that there was no hope; the ship was a total loss. At about 1200, it was noted that the anchor chain had parted and was hanging loose. At 1315, the following message was sent:

"SHIPTRAMP
NEW YORK

"URGENT INDIAN NAVY SUBMARINE DIVERS INSPECT VESSEL FIND FROM NO 2 FORWARD TO BOW VESSEL ON BOTTOM AND FROM NO 8 TO STERN POST ON BOTTOM STOP FORWARD OF NO 8 TO NO 2 CONTINUOUS CRACK AND STEADY SEEPAGE STOP NAVY CAPTAIN SAYS QUOTE NO HOPE SHIP TOTAL LOSS UNQUOTE DO EVERYTHING POSSIBLE TO EVACUATE FIVE REMAINING OFFICERS ABOARD STOP TUG CHALLENGER ARRIVING 29TH 1000 LOCAL.

MASTER"

37. The weather worsened during the latter part of the 28th, and at about 2130 the vessel started to move and continued so for about 7 hours. It shifted position about 200 yards to the east.

38. At about 0300, 29 September, the Philippine tug CHALLENGER appeared on the scene. At about 0615, the emergency generator ran out of fuel. At about 0800, the Master and other personnel prepared to abandon ship. The swells were 12-to-15 feet high, running alongside the ship. The hydraulic start mechanism for the motor of No. 1 lifeboat had blown a seal ring in the hand pump during a routine engine starting test before the grounding, so the oar-propelled No. 3 lifeboat was utilized.

39. The Master, Chief Mate, Chief Engineer and Radio Operator boarded the lifeboat, while First Assistant Engineer Poore remained aboard the vessel to operate the winch to lower the lifeboat. The Master and Chief Mate took positions in the forward end of the boat, and the Chief Engineer and Radio Operator were in the stern. As the boat was lowered, it was carried up and down by the swells.

40. The lifeboat was equipped with Rottmer releasing gear which releases the falls at both ends of the boat at the same time. The lever to operate this gear is located just forward of midships in the boat, and when operated it rotates shafting connected through universal joints to hook locks at the bow and stern. The hooks are fitted with preventer bars to prevent the falls from accidently becoming detached when the boat is waterborne and there is no weight on the falls. However, if the preventer bars are rotated up 90°, the falls can be released if slack. As the boat was moving up and down on the swells, the Radio Operator released the falls at the after end. The boat, attached at the forward end only, assumed a nearly vertical position with the action of the sea, and started to slam against the side of the vessel. The Chief Mate was unable to release the falls at the bow and as the boat dropped after a particularly large swell, the bow of the boat in way of the releasing gear fastening tore out, and the boat was free. The oars were unshipped and they rowed the boat clear of the ship. They were taken in tow by a motorboat from the CHALLENGER, and were taken aboard the tug.

41. The No. 3 lifeboat was manufactured by the Marine Safety Equipment Co., in 1966, manufacture number 1700. It is a riveted steel constructed, oar-propelled, 24-foot, 30-person capacity lifeboat, equipped with Harkrader Marine Safety Equipment Rottmer

disengaging apparatus. On 4 May 1974, this disengaging apparatus was inspected and found to be in good work order by the attending U. S. Coast Guard Marine Inspector at Todd Shipyard, Alameda, California, while the SS TRANSHURON was undergoing a U. S. Coast Guard inspection for certification.

42. When First Assistant Engineer Poore observed the difficulty in releasing the forward falls, he ran and got a fire axe and was in the process of cutting the falls when the bow of the boat tore out. As the lifeboat departed, he went to the upper bridge deck of the forward house, port side, and launched the inflatable liferaft by rolling its container over the side. When the container was in the water, he pulled the painter to trip the CO^2 cylinder. The raft inflated properly and then came free of the painter at its connection to the raft and sailed away under the influence of the wind and sea.

43. The liferaft in question was serviced in the presence of a U. S. Coast Guard Marine Inspector at the licensed service facility for Switlik liferafts located at Coast Marine and Industrial Supply, Inc., 398 Jefferson Street, San Francisco, California, on 8 May 1974. Records at the U. S. Coast Guard Marine Safety Office in San Francisco indicate that the raft was manufactured by the Switlik Parachute Co., Trenton, New Jersey in January of 1967 and bore the serial number SPC/MM/34, Lot Number 9. Regulations in effect at the time of the servicing required that the nylon raft painter have an unknotted breaking strength of 3000 pounds. Manufactures' instructions approved by the Coast Guard require that it be attached to the raft's towing bridle with a bowline knot. It was standard practice at the Coast Marine raft service facility to tape the bitter end of the bowline knot back on to the painter as an added assurance that the painter line would not become inadvertently detached. Reports have been received of painters found severed when rafts are opened for servicing.

44. Poore then went up to the bow, where there was the least amount of oil on the water, and waited for the boat from the tug CHALLENGER. The boat approached to within about 30 feet and the boat crew said they couldn't get any closer. Poore jumped overboard, the boat crew threw him a line which he caught; he was then taken aboard the boat and then the tug. The CHALLENGER then took the group to Cochin. En route to Cochin, the following message was transmitted to the tug owners in Manila, for relay to Hudson Waterways:

"2 MT CHALLENGER/DVDB CK 61 29 SEPT 74 100LT
RUSH RUSH CAPT. BELLA LUSTEVECO MANILA

5943/TRANSHURON
MARINE BOARD

"MASTER S/S TRANSHURON REQUEST PASS FOLLOWING MESSAGE TO SHIPTRAMP NEW YORK X QUOTE MASTER AND FOUR OFFICERS ABANDON SHIP 0830 LOCAL STOP NO HOPE TOTAL LOSS CARGO TOTAL LOSS STOP 28 MEN STILL ON KILTAN ISLAND MUST BE EVACUATED STOP YOU MUST PHONE COCHIN AGENT AND MAKE ARRANGEMENTS TO EVACUATE THESE MEN STOP ABOARD MT CHALLENGER. UNQUOTE.

RE FINDOR"

45. Upon receipt of information concerning the stranding, Hudson Waterways engaged the services of a salvage company to conduct a survey. A survey party boarded the vessel on 12 October 1974, and found little pollution and only a small amount of oil leaking from underwater on the starboard side. The island has a bank about 4-feet high on the side nearest the vessel, and there was an oil mark on it for about 3/4 mile. No evidence of oil was elsewhere on the island, in the lagoon or the sea. The weather decks and superstructure of TRANSHURON were covered with oil from the action of the sea. Oil was also in the internal spaces where portholes and doors had been left open.

46. The vessel was found hard aground at position 11° 29.9N, 73° 00.1E, on a heading of 300°T., and with a 1.5° list to starboard. Soundings indicated that cargo tanks 3, 4, 7, 8, 9 Port, 4, 5, 6, 7, 8, 9 Center, and 3, 4, 5, 6, 7, 8, 9 Starboard were leaking. The after pumproom, engineroom, engineroom double bottom tanks and the after peak tanks were also leaking. The engineroom and shaft alley were flooded to within about 4-feet of the main control platform. No cracks were found in the ship's sides from the waterline to the main deck, and the vessel was not breaking up. Draft of the vessel was 25.0-feet forward, 23.0 midships starboard, 22.0-feet midships port, and 21.5-feet aft. Soundings taken around the vessel suggested that it was hard aground from the after part of No. 2 cargo tanks to the stern. Soundings of the cargo tanks indicated that of the 117,251 barrels of cargo, approximately 89,723 barrels remained onboard.

47. Concerned because the vessel posed a pollution threat, the India government took the necessary action to have the cargo removed and stored in tanks ashore. On 6 December 1974, it was reported that the transfer had been completed.

CONCLUSIONS

1. The cause of this casualty was the loss of main propulsion power. Contributing to the stranding were:

a. Delay by the Master to take independent action to obtain assistance from those vessels offering or capable of rendering help.
b. Delay of communications between TRANSHURON and Hudson Waterways.
c. Failure of TOSHIMA MARU's line-throwing gear.
d. Action of TOSHIMA MARU after the gun failed.

2. The loss of main propulsion power was due to a fire in the main propulsion control desk, caused by the action of sea water directed onto high voltage components in the control circuitry. Contributing to the fire were:

a. Failure of a pipe nipple in a gage connection in the circulating water header of the freon condenser of the air conditioning unit.
b. Wasting of the material of the pipe nipple due to the connection of dissimilar metals in a salt-water environment.
c. Location of the air conditioning unit under the main switchboard and the proximity and alignment of the gage connection to the opening in the deck of the main propulsion control desk.
d. The opening in the deck of the main control desk.

3. Contributing to the extent of damage caused by the fire were:

a. Failure of the engineer on watch to take immediate action to de-energize the propulsion control desk. The damage was further aggravated by the failure of the Chief Engineer to de-energize the control desk following his arrival on scene. No amount of CO_2 from all available sources would have been effective while the circuitry remained energized.

4. The fire was successfully extinguished after the main switchboard was completely de-energized.

5. Emergency repairs were beyond the independent capability of the ship's crew.

6. Difficulty encountered during launch of No. 3 lifeboat was caused by the failure of the crew to use proper procedures and operate the release lever for simultaneous release of the falls at both ends of the boat.

7. Cause of the loss of the liferaft are unknown. The most likely causes are:

a. Vandalism.
b. Painter not properly secured to raft.

8. Cause of the failure of the hose of the B-V semi-portable CO^2 extinguisher is unknown. There are no regulations which specify periodic testing of hoses for semi-portable CO^2 fire extinguishers.

9. The installation of the air conditioning unit was not in compliance with existing regulations.

RECOMMENDATIONS

1. That the Coast Guard take necessary action to immediately disseminate (prior to the formal release of the report) the basic facts concerning the cause of this casualty to the marine industry, including those involved in approval and inspection, to reemphasize the hazard of piping in way of electrical equipment, and the need for shielding or other precautionary measures.

2. That the Masters of vessels emphasize knowledge of the operation of fire fighting, lifesaving and all other emergency equipment during drills.

3. That Coast Guard personnel, as part of the routine inspection procedure, insure that crew members indicate knowledge of the proper operation of installed fire fighting systems.

4. That the Coast Guard give consideration to amending applicable regulations to require that hoses of semi-portable CO^2 fire extinguishers be tested at the time of each inspection for certification.

5. That the regulations in Title 46 CFR 111.30-1(c) be amended to include a requirement for the shielding of switchboard openings in the base and sides, in addition to the existing requirement for a drip-cover over the top.

6. That the Coast Guard conduct a survey of the establishments that service inflatable life rafts to determine if there is evidence of a significant problem due to vandalism involving the painters and if so, pass the information to the raft manufactures for consideration relative to design modification.

7. That further investigation be conducted concerning the violation of regulations relative to the air conditioning unit installation, including the circumstances which permitted the installation.

5943/TRANSHURON
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