

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

M-205

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Forwarded to:

Admiral James S. Gracey  
Commandant  
U.S. Coast Guard  
Washington, D.C. 20593

SAFETY RECOMMENDATION(S)

M-83-1 through -7

Shortly before 2000 P.s.t. on February 14, 1982, a fire erupted in the engineroom of the Cypriot bulk carrier PROTECTOR ALPHA while it was moored to the dock in the Columbia River at the North Pacific Grain Growers Association grain elevator near Kalama, Washington. As a result of the accident three crewmen were injured. Three persons who were not crewmen, but who were involved in firefighting operations, were also injured; one Coast Guardman was injured fatally. The PROTECTOR ALPHA's engineroom and the entire deckhouse, which included the pilothouse were completely destroyed. The damage has been estimated at \$15 million. 1/

The PROTECTOR ALPHA was outfitted with only one self-contained breathing apparatus -- all that it was required to carry under the Safety of Life at Sea Convention of 1960 (SOLAS 1960) to which it was subject. The Safety of Life at Sea Convention of 1974 (SOLAS 1974), which became effective in May 1980, requires new cargo vessels to carry at least two self-contained breathing apparatus. U.S. regulations 2/ require U.S. cargo vessels on an international voyage to carry two self-contained breathing apparatus, with one spare recharge for each. Both the SOLAS conventions and U.S. regulations refer to the self-contained breathing apparatus as being part of a "fireman's outfit."

The fire in the engineroom resulted almost immediately in the loss of electric power aboard the ship and rendered its electrically driven primary fire pumps inoperative. The ship's emergency fire pump had been considered inoperative even before the fire erupted. However, even if the fire pumps on the vessel had been operable, the crew would have had to enter the smoke-filled engineroom to fight the fire. Accepted firefighting practices require a hose team of at least two persons, supported by a backup hose team of at least two others, to attack a fire. Therefore, for the crew to have directed even one stream of water or foam at the fire in the engineroom, they would have needed, at a minimum, four self-contained breathing apparatus and probably many spare charges. The Safety Board believes, therefore, that a requirement for one or two self-contained breathing apparatus is totally insufficient to provide adequate fire protection to ships. This insufficiency

1/ For more detailed information, read Marine Accident Report—"Fire On Board the Cypriot Bulk Carrier PROTECTOR ALPHA, Columbia River Near Kalama, Washington, February 14, 1982" (NTSB-MAR-83-1).

2/ 46 CFR 96.35-10 and 46 CFR 96.35-20.

makes it virtually impossible for crewmen entering an enclosed space to make an effective shipboard fire suppression effort. Since sufficient breathing protection is not available to crewmen on board ships, fires must be fought by abandoning the space on fire and activating an installed fire extinguishing system. However, if a system malfunctions or if an error is made in activating the system, the fire quickly burns out of control and the situation becomes desperate, especially if the ship is at sea. The Safety Board believes that the Coast Guard should review, from a practical firefighting viewpoint, the requirements for self-contained breathing apparatus aboard cargo vessels and determine a more realistic number of such appliances to require. Once such a number is determined, the Coast Guard should amend the appropriate domestic regulations and work through the International Maritime Organization (IMO) to effect a similar requirement on an international basis.

Based upon the testimony of the first officer that he had been informed that the crew had activated the CO<sub>2</sub> fire extinguishing system when he returned to the vessel with the master and the testimony of the assistant chief of the Kalama Fire Department that the CO<sub>2</sub> piping was frosted when he went into the CO<sub>2</sub> storage room with the chief engineer, the Safety Board believes that the crew, at some time shortly before it was ordered ashore, activated the 67 cylinders of the CO<sub>2</sub> system preset to discharge into the engineroom. In order for a CO<sub>2</sub> system to extinguish a fire, the space on fire must be sealed off from the outside atmosphere. The CO<sub>2</sub> gas may then blanket the fire, depriving it of oxygen and smothering it. If the compartment containing the fire is not properly sealed, the CO<sub>2</sub> gas will dissipate and the fire will rekindle. In this accident, the engineroom was not effectively sealed until sometime after the master and the first officer returned to the vessel.

To respond correctly to a shipboard fire, a crew must be adequately trained. The best form of training is undoubtedly provided by the shoreside marine firefighting schools. However, there are relatively few such schools worldwide, and lessons learned by those fortunate enough to have attended such schools can be short lived if they are not reinforced by frequent and meaningful drills. For the majority of crewmen, who have not attended such schools, the shipboard drill is probably the only firefighting training available to them. The master of the PROTECTOR ALPHA described the weekly drills that he conducted aboard the ship as being little more than a muster of the crew and a demonstration by the officers of how to operate a portable fire extinguisher. Unfortunately, such drills are probably representative of the type of fire drill conducted on many cargo ships and are, to a large extent, devoid of training value for fighting a ship fire. The Safety Board has identified this problem in the past. In its report of the fire on board the Italian passenger ship ANGELINA LAURO, <sup>3/</sup> the Safety Board cited the perfunctory nature of shipboard fire drills and recommended that the Coast Guard develop and implement more stringent requirements for conducting fire drills on foreign passenger vessels that embark passengers in U.S. ports. <sup>4/</sup> The Safety Board believes that there is a need for more meaningful fire drills aboard cargo vessels, as well as passenger vessels, and that the Coast Guard should work within the International Maritime Organization (IMO) framework to stimulate international action to develop guidelines for conducting meaningful drills.

<sup>3/</sup> For more information, read "Marine Accident Report -- "Fire Onboard the Italian Passenger Ship ANGELINA LAURO, Charlotte Amalie Harbor, St. Thomas, U.S. Virgin Islands, March 30, 1979" (NTSB-MAR-80-16).

<sup>4/</sup> The Coast Guard did not fully concur with this recommendation, but it did agree to emphasize more realistic drills when conducted in the presence of Coast Guard inspectors.

The PROTECTOR ALPHA was equipped with a fixed CO<sub>2</sub> fire extinguishing system. At the time of the accident, the system was activated, but it failed to extinguish the fire. As previously stated, this failure was probably the result of a premature release of the CO<sub>2</sub> gas before the engineroom was properly sealed. However, since all plans, diagrams, and operating instructions that pertained to the CO<sub>2</sub> system aboard the PROTECTOR ALPHA were printed in German, a language that no one aboard the vessel could read or understand, it is possible that when the CO<sub>2</sub> was released, it was erroneously routed to a space other than the engineroom. SOLAS 1960, which applied to the PROTECTOR ALPHA, did not require that fire control plans be printed in the national language of the ship's crew. SOLAS 1974 requires fire control plan descriptions to be in "the national language." It further requires that if the national language is neither English nor French, a translation into one of those languages shall be included with the plans. Unfortunately, these particular requirements apply to new ships only. <sup>5/</sup> The Safety Board believes that operating instructions for vital emergency equipment, such as fire extinguishing systems, and vital ship data, such as stability information, should be available in a language which is readily understood by the ship's officers. The Safety Board therefore believes that the Coast Guard should propose adoption of a resolution to this effect by the IMO.

In accordance with U.S. Coast Guard policy, the COTP for Portland, Oregon, developed a contingency plan for response to shipboard fires. However, a copy of this plan was not sent to the Kalama Fire Department. The COTP said that copies of the plan were sent only to "major ports" in his jurisdiction. The Safety Board believes that for a shipboard fire contingency to be effective, it must be distributed as widely as possible. Such a plan should be sent to every local firefighting authority within which ships regularly dock. Its distribution to smaller port areas, which are remote from major firefighting resources, is perhaps more important than to major ports because major ports are generally capable of dealing effectively with a major shipboard or waterfront fire even without the benefit of a Coast Guard contingency plan.

Small port areas, which are remote from major firefighting resources, face special problems which are not adequately addressed in the current contingency plan. The logistical problems incidental to fighting a shipboard fire in remote areas must be solved ahead of time. In this accident, the fire erupted about 2000 on February 14, 1982, and the first of the vessels and supplies necessary to fight the fire were not on scene until around 0300 the following morning. Response to a shipboard fire must be more timely than this if the firefighting effort is to be successful. The fact that the vessel was cast adrift from the dock and anchored in the river does not, in the Safety Board's opinion, entirely explain the lack of a more timely response. Because a fire could break out on a ship at any time, whether the ship is at a dock or in the river, the contingency planning should provide for a timely response in either eventuality.

Even though the city of Portland, Oregon, dispatched one of its fireboats to this fire, it had no responsibility to do so. The fire not only was located outside the jurisdiction of Portland, but also outside the State of Oregon as well. In the absence of specific arrangements, the city of Portland should not be expected to provide marine fire protection outside of its geographical limits. The Coast Guard dispatched vessels from Portland and Astoria, Oregon, but the Coast Guard does not consider itself to be, or hold itself out to be, a marine fire department. Moreover, larger Coast Guard vessels, which are the only vessels that have significant firefighting capability, were by nature slow

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<sup>5/</sup> SOLAS 1974 defines a new ship as a ship the keel of which is laid or which is at a similar stage of construction on or after the date of coming into force of the Convention (May 1980).

moving ships. By the time the vessels which were dispatched arrived at the accident scene, the fire was about to break out from the confines of the engineroom to involve the superstructure and was probably beyond control. This accident highlights the need for major firefighting resources to a more rapid response in remote port areas on the Columbia River. In 1975, the Coast Guard, the National Aeronautics and Space Administration (NASA), and the Maritime Administration participated in a project which resulted in the development of a lightweight, helicopter transportable firefighting module which could be deployed rapidly to the scene of a shipboard, dockside, or open sea fire incident. Such modules are commercially available today and are in use by the city of Miami, Florida, (Fire Department) and by the U.S. Navy. The Safety Board believes that the Coast Guard should take the initiative in promoting the availability of a more rapid response capability to a shipboard fire in remote port areas on the Columbia River with major fighting resources.

An effective contingency plan should provide clearly drawn lines of authority and responsibility. The plan must establish who is responsible for firefighting operations if a fire breaks out on a ship at a particular facility or within a particular fire district. The Safety Board believes that such a determination should be in the form of a written agreement between the COTP and each local fire authority, executed in advance of any fire, and appended to the contingency plan. For sparsely populated, remote municipalities lacking major resources and expertise in marine firefighting, and for areas within the COTP zone, which are outside municipal fire districts, consideration should be given to establishing agreements with private firefighting and marine salvage firms. Further, because the saving of shipboard property, whether from fire or from other cause, is the business of private salvors, they should be called as soon as it is recognized that the extinguishment of the fire is beyond the municipality's capability. The Coast Guard and the local authorities may then assume secondary support roles (as far as actual firefighting operations are concerned), which they are generally able to fulfill effectively.

Therefore, the National Transportation Safety Board recommends that the U.S. Coast Guard:

Review from a realistic, professional firefighting viewpoint the minimum number of self-contained breathing apparatus and spare charges that should be required on board cargo vessels which operate on international voyages and, based upon the results, amend the appropriate sections of Title 46, Code of Federal Regulations to reflect a more realistic quantity of that equipment required on board U.S. cargo vessels and work within the framework of the International Maritime Organization to obtain acceptance of a more realistic international standard as to the minimum number of self-contained breathing apparatus on cargo vessels. (Class II, Priority Action) (M-83-1)

Within the framework of the the International Maritime Organization, work to develop an international standard for conducting more meaningful shipboard fire drills. (Class II, Priority Action) (M-83-2)

Propose adoption of a resolution by the International Maritime Organization to the effect that operating instructions for vital emergency equipment and vital ship data, such as stability information, be printed in a language which is readily understood by the ship's officers. (Class II, Priority Action) (M-83-3)

Expedite the development of guidelines to Captains of the Port for coordinating multijurisdictional planning for various port disasters. (Class II, Priority Action) (M-83-4)

Take the initiative in promoting the availability of a more rapid response to a shipboard fire in remote areas on the Columbia River with major firefighting resources. (Class II, Priority Action) (M-83-5)

Require that COTP fire contingency plans define the lines of authority and responsibility for actually fighting a shipboard fire and that a pre-arranged, written agreement be formulated with the various local firefighting authorities within the COTP zone. (Class II, Priority Action) (M-83-6)

Establish and execute a policy whereby private firefighting and marine salvage firms are summoned to take control of firefighting activities if the immediate extinguishment of a shipboard fire is beyond the capabilities of the local fire department, or if the fire occurs while the ship is located outside a municipal fire jurisdiction. (Class II, Priority Action) (M-83-7)

BURNETT, Chairman, and McADAMS, BURSLEY, and ENGEN, Members, concurred in these recommendations. GOLDMAN, Vice Chairman, did not participate.

  
By: Jim Burnett  
Chairman