Log M-221

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

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Forwarded to:

Mr. Michael Klebanoff
President
Ogden Marine, Inc.
280 Park Avenue
New York, New York 10017

SAFETY RECOMMENDATION(S)

M-83-63 through -65

About 0015 on June 16, 1982, the engineer on watch discovered an excessive amount of water in the engineroom bilges on the U.S. flag tankship OGDEN WILLAMETTE, which was en route to Bayway, New Jersey, from Puerto Armuelles, Panama, via the Panama Canal loaded with 150,000 barrels of Alaskan crude oil. The vessel was steaming at its normal sea speed of about 16.0 knots in the Caribbean Sea about 50 nmi southeast of Jamaica. He immediately ordered the engineroom bilge pump started and notified the chief engineer. The entry of water exceeded the capacity of the bilge pump, and when the water level reached the main circulating pump motors, the engineering plant was secured. Although the chief engineer closed the main circulating pump's high sea suction valve and the main condenser's overboard discharge valve, the water continued to rise, and the master ordered the crew to abandon ship. 1/

The engineroom flooded to about 6 feet below the main deck. The vessel remained afloat with its after deck awash. It was towed to the Cayman Islands, where the engineroom was pumped out and the cargo was transferred to another tanker. The OGDEN WILLAMETTE was later towed to New Orleans for repairs. The damage was estimated to be $16 million.

The 2000-2400 (8-12) engineroom watch had been relieved about 2350 on June 15 by the 0000-0400 (12-4) watch, which consisted of a licensed third assistant engineer and an unlicensed oiler/maintenance utility (OMU). The previous watchstanders gave the engineer and the oiler routine information, and said that nothing unusual had happened during their watch. About 2355, the 12-4 oiler began his inspection of the engineroom, which included, but was not limited to, checking oil levels on the machinery, recording temperatures of water at the inlet and outlet sides of the main condenser, checking the bilges for water, and checking the main shaft bearings and the stern tube bearing in the shaft alley.

1/ For more detailed information, read Marine Accident Report—"Engineroom Flooding and Near Foundering of U.S. Tankship OGDEN WILLAMETTE, Caribbean Sea, June 16, 1983" (NTSB/MAR-83/06).

When the 12-4 oiler returned to the operating platform, the watch engineer left to start his inspection of the engineroom spaces. About 0010 on June 16, he went down to the generator flat, checked the generators and the air compressor, and proceeded to the port side to look at the evaporator. After completing this inspection, he went to the lower level via the forward ladder and discovered water in the bilges almost over the cargo pumps. He immediately returned to the operating platform and ordered the oiler to start the engineroom bilge pump. He called the chief engineer and the first assistant engineer and informed them of the excessive amount of water in the bilges. He then returned to the lower level to check that the bilge pump was operating. He did not open the emergency bilge suction valve from the main circulating pumps which is provided to pump water out at a much faster rate.

After finding the bilge pump operating and being informed by the oiler that the bilge suction valves were open, the watch engineer returned to the operating level and found that the chief engineer and the first assistant engineer had arrived. The chief engineer immediately took charge, and the first assistant engineer went below to check the water level. The first assistant engineer said that when he reached the ladder to the lower level, the water had risen to an estimated height of 3 1/2 to 4 feet above the tank top (the lowest level of the engineroom). He stated, "it's right up to the bottom of my motors [main circulating pumps]." He said that, from his position on the ladder, the starboard condensate pump motor was visible because the rising water had not yet reached it. He immediately returned to the operating platform and told the chief engineer, "the water will be at the electric motors at any time now." He then rang the general alarm.

Within seconds after the chief engineer was informed of the water level, the No. 1 generator started to surge. He ordered the main engine stopped. The second assistant engineer arrived in the engineroom, and he and the third assistant engineer started to put out the fires in the boilers. The chief engineer then went aft and started to close the manually operated shaft alley watertight door using the handwheel provided. However, the smoke from the burning insulation in the electric motors became unbearable and forced him to leave the engineroom before fully closing the watertight door.

The chief engineer ordered the first assistant engineer to start the fire and bilge pump located in the shaft alley. The first assistant engineer sent the second pumpman and the 4-8 oiler into the shaft alley via the shaft alley escape trunk in the steering gear room to align the valves and start the pump. When they entered the shaft alley, they noticed that the shaft alley watertight door had not closed properly. A 2-inch-wide gap at the upper port corner of the door allowed the water in the engineroom to leak into the shaft alley. The water level in the shaft alley was over the top of the fire and bilge pump, and water was beginning to enter the pump motor housing. The oiler stated that they did not attempt to close the watertight door because "the pump would be further in the water and that would lessen any chances on trying to get the pump started."

The OGDEN WILLAMETTE was towed to the Cayman Islands, about 280 nmi away because the vessel's owners and the Jamaican government could not agree on a location in Jamaican waters where salvage and emergency repairs could be made. About 1400 on June 24, the OGDEN WILLAMETTE anchored about 1/2 nmi off the southwestern end of Little Cayman Island, located approximately 100 nmi off the south coast of Cuba.

Salvage divers began surveying the underwater hull in the way of the engineroom. After finding no visible damage, they rigged a patch over a seachest where they detected a surge of water. They also plugged the auxiliary condenser's overboard discharge line.

Salvage pumps were set up, and by 1800 on June 29 the engineroom was pumped out, and the survey party entered the engineroom. The salvage master discovered that the water entered the engineroom through the auxiliary condenser's overboard discharge line. The U.S. Coast Guard inspector stated that, "the chief engineer was very distraught with himself in that he did not secure this valve when the casualty was discovered." While the salvage crew was pumping the engineroom, the plug in the discharge line became dislodged, and the water level started to rise. After the salvage crew closed the 12-inch-diameter gate valve to the discharge line, the water was pumped out. When the pumps were secured, the auxiliary condenser's overboard discharge valve was opened slightly to allow seawater to enter the system to determine the location of the leak. A crack was discovered on the bottom of the 26-inch-diameter rubber expansion joint in the main low sea suction line inboard of the suction valve. The 12-inch-diameter inlet valve to the auxiliary condenser located over the inlet pipe to the main condenser also was found open. No other sources of water entry were found.

The chief engineer's policy of leaving the inlet and discharge valves open at all times increased the probability that a valve could be overlooked when it became necessary to close all sea connections in an emergency. An open sea valve to a system not in use also increases the risk of flooding by any failure in the associated piping. Even though the chief engineer secured the main inlet and discharge valves for the main condenser after the flooding was reported, which indicated that his first thought was to close off the water inlets to the engineroom, he failed to close the valves for the auxiliary condenser which also were connected to the main cooling system. During the emergency, he and his watch engineers apparently did not remember which valves in the cooling system were open. The status of all systems should be known to all watch engineers so that nothing is overlooked when rapid decisions have to be made, especially in an emergency.

When a marine engineer prepares to operate any machinery in an engineroom, he should comply with the basic requirements for operating the particular equipment--that of aligning valves, adjusting controls, and checking power sources before starting. If the valves for the auxiliary condenser are left open when not in use, they tend to be forgotten, as they were in this case. The accident aboard the OGDEN WILLAMETTE indicates that some important operational items were overlooked.

It is particularly important that engineering personnel be trained in procedures to be followed if the engineroom floods. In this case, no attempt was made to open the engineroom emergency bilge suction valve and close the main high sea suction valve when the flooding was first detected. If a list had been prepared of the various emergencies that could occur in the engineroom of the OGDEN WILLAMETTE, with steps to follow in each situation, the watch engineer might have taken the proper action to combat the flooding. When the general alarm sounded, the chief engineer's entire department responded to the emergency; however, when the machinery was stopped, the chief engineer ordered everyone out of the engineroom while he alone attempted to secure the area. He closed the main condenser's high sea suction valve and overboard discharge valve and started to close the shaft alley watertight door. If he had ordered some of his assistant engineers to perform these tasks, he might have remembered to close the auxiliary condenser's overboard discharge valve. He had been chief engineer aboard the vessel since 1969. No one aboard knew the systems as well as he did. He could have delegated the various tasks and still have maintained overall control of the situation. Had he done so, the engineroom probably would have been secured more quickly and evacuated before anyone was affected seriously by the smoke and fumes.

When the 12-4 third assistant engineer ordered the engineroom bilge pump started, he apparently did not think of opening the emergency bilge suction valve on the main circulating pumps, nor did the chief engineer instruct him to do so. By using the emergency bilge suction, the engineroom could have been pumped at a faster rate, and with both main circulating pumps in operation, the flooding might have reduced sufficiently to allow the chief engineer time to check other systems such as the auxiliary condenser whose valves were open. The water was rising at the rate of 4 feet per hour when reported by radio to the Coast Guard. The chief engineer had checked the main low sea suction valve to see if it was closed, but he did not check the overboard discharge valve for the auxiliary condenser. At the reported flooding rate, there should have been ample time to close this valve before the rising water made it inaccessible.

One of the last tasks the chief engineer attempted before leaving the engineroom was the closing of the watertight door to the shaft alley. He could not complete this task and instead ordered it closed from the remote control station in the main deck passageway after he exited the engineroom. This method of closing the watertight door did not permit the operator to visually check the closure. The Safety Board could not determine why it did not close completely from the remote station. If the door had been closed immediately after the general alarm sounded, the gap near the top of the door might have been detected and the door closed completely before the engineroom was evacuated, thus preventing the flooding of the shaft alley. The Safety Board believes that where circumstances require that shaft alley watertight doors be kept open on tankships while at sea, they should be closed immediately upon the sounding of the general alarm. A crewmember should be so designated in the fire and emergency procedures on the ship's station bill to close the shaft alley watertight door.

Therefore, the National Transportation Safety Board recommends that Ogden Marine, Inc.:

> Modify the station bills of the S/S OGDEN WILLAMETTE and similar vessels in your fleet under the "fire and emergency station" section to designate an engine department crewmember to close the shaft alley watertight door. (Class II, Priority Action) (M-83-63)
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> Provide a ready means to inform the engineering personnel on vessels in your fleet of the current status of all seavalves in the engineroom so that each watch is aware of the valves that must be closed to maintain watertight integrity in an emergency. (Class II, Priority Action) (M-83-64)
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> Require that the chief engineer of each vessel in your fleet establish written procedures for the watch engineers to follow for emergencies such as flooding, fires, and explosions. (Class II, Priority Action) (M-83-65)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and McADAMS, BURSLEY, and ENGEN, Members, concurred in these recommendations.

By: Jim Burnett
Chairman