

Safety Clicks

Learning from
others' mistakes

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Bridge Resource Management

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In our last issue, we discussed company culture and reviewed the findings of the US Navy investigation into several recent incidents in the Pacific fleet that resulted in the deaths of many sailors.

The NTSB recently released its findings from the investigation of the El Faro tragedy. Aside from the El Faro Captain's stubborn refusal to listen to his mates' recommendations to change course, the findings are strikingly similar.

In both investigations, the bridge and other equipment was working properly. The break downs occurred because the crew did not understand how the equipment worked and failed to work as a team.

Bridge Resource Management is the ability to make use of all available resources including equipment, information and personnel, in order to safely complete the vessel's mission.

Open communication, situational awareness, speaking up and working as a team are all human factors of Bridge Resource Management. While these are often referred to as "soft skills", but there is nothing soft about them. The ability to evaluate a situation, information and personnel to draw conclusions and make decisions are critical to safe operations in any dangerous activity.

That means the entire crew, from deckmen to engineering to the bridge need to be able to communicate effectively, update each other when the situation changes and speak up if they see something unsafe. It also means that each crewman needs to understand how to use the equipment in his department and know how it could be affected by changing conditions.

How well do you know your equipment? How would rough seas affect your systems? Do you know what to do in an emergency?

Lessons from the El Faro Investigation

The cargo ship El Faro lost engine power in a Category 3 hurricane during its weekly run between San Juan, Puerto Rico and Jacksonville, Florida and sank near the Bahamas in 2015. None of the 33



A preliminary report submitted to the U.S. Coast Guard found that the El Faro was operating with a minimum margin of stability and would not have met standards for a ship built today.



El Faro's bridge as seen from an ROV. The vessel was found at a depth of 15,000 feet.

TOP Safety Card Hits
(Fleetwide last month)

Housekeeping 11

Safety Attitude 6

Procedures 4

[El Faro Investigation: NTSB Report](#)

crew members survived. A thorough review of the ship's black box and two years of investigation produced the following conclusions.

The NTSB board unanimously agreed that the cause of the accident was the captain's insufficient action to avoid the hurricane, his failure to use current weather data, which was available on the vessel and his refusal to consider multiple requests by his bridge crew and shipowner Tote Maritime Inc.'s management system to change course.

"By not coming to the bridge as the mate suggested, and by dismissing their suggestions to change course, the captain missed opportunities to reassess the situation and alter the voyage plan," said Carrie Bell, who investigated human factors in the accident. "Given the responsibility of his position, and the risk of upcoming weather, it is difficult to explain how the captain could have been absent from the bridge as the ship sailed into a hurricane."

Multiple incidences of the crew not understanding how the equipment worked or lack of training on systems was evident.

The company did not have an effective training program for use of the Bon Voyage weather information software. Up to date weather information was available on board, but the captain relied on an emailed report that was six hours behind real time. It appears the captain was unaware of the delay inherent in the software.

The company used CargoMax software for its stability instrument—which could have identified the vessel's downflooding points—but did not effectively train the crew to use it.

The ship began to list due to increasing wind on the vessels beam— at times over 100 miles per hour. The level of lube oil in the main engine sump was not maintained in accordance with the vessel's operation manual, increasing the risk of loss of oil pressure at a sustained list.

If the ship's officers had know the maximum static list angle at which the propulsion engine operated, they would probably have attempted to correct the list before the engine failed or added oil to the tank to prevent loss of suction.

A watertight scuttle to cargo hold 3 on the second deck was open, allowing water to violate the watertight envelope of the vessel. The water in cargo hold 3 along with the motion of the vessel caused automobiles in the hold to break free of their lashings. The free floating vehicles most likely broke the seawater piping to the emergency fire pump, flooding the hold and significantly compromising the vessel's stability. The bilge pumps were activated but could not keep up with the rate of flooding. By the time the captain ordered abandon ship, it was too late to save the vessel or the crew.

The vessel did not have a damage control plan and the captain was exempt from training in heavy weather operations, including advanced meteorology and ship handling.

The company's lack of oversight in critical aspects of safety management, including gaps in training for shipboard operations in severe weather, denoted a weak safety culture in the company and contributed to the sinking of *El Faro*.

