Mariners' Alerting and Reporting Scheme

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MARS 202123

Aground, then punctured, a vessel turns sideways

As edited from SHK (Sweden) report RS 2018:02

➔ A general cargo ship loaded with grain was in a river waterway and approaching a lock entrance. On the bridge the pilot was steering the vessel and the Master was controlling the main engine according to the pilot's instructions. The propulsion/steering consisted of a reversible propeller surrounded by a controllable propeller nozzle/rudder.

As the vessel approached the lock at about 4 knots, the Master initiated a reversing manoeuvre according to the pilot's instruction, but the reverse order did not work. The vessel's bow now pointed to the port shore. A new reverse manouevre was attempted. Reverse power began, but not in time to keep the vessel from grounding. With reverse power still at full, the ship came back into the channel relatively quickly. During this movement, the vessel's starboard side heavily contacted the cement support dolphins of the lock approach jetty. Unknown to the crew, this contact caused a hull breach just below the waterline.

The ship was quickly moored port side to, on the lock approach jetty. Shortly afterwards, the ship began to list to starboard. Due to the grounding, it was assumed that there was water ingress into one of the starboard double bottom ballast tanks, so the crew countered by filling port tanks. The ship had an estimated list of 15–17 degrees to starboard so ballasting on the port side continued as there was concern that the ship would capsize to starboard. The list to starboard was decreasing when suddenly the vessel flopped to port and lay against the jetty with a 20 degree list. The crew were brought on shore. The ship later rolled further to port and stabilised at about 54 degrees.

After nearly four weeks salvage work, the ship was declared a total constructive loss and was scrapped. The investigation found, among other things, that although the initial grounding incident was relatively minor, it quickly developed into a serious accident requiring a protracted salvage process. Water ingress was not into the double bottom tanks as initially assumed by the crew, but into the starboard dry-space tanks higher up, with the breach just below the waterline.

Lessons learned

- If at all possible, leave a ship in its grounded position until a full assessment of the damage has been carried out.
- If damage to the hull is suspected, ensure your information as to water ingress is correct before initiating any counter action. Sound all tanks and first establish where the damage has occurred.
- Once you have established where the damage has occurred, initiate corrective action as per the stability booklet or stability calculations. Any unplanned or improvised actions could have unintended consequences.
- Commonly, provided the ship still has positive stability, damage stability tactics require filling the double bottom tanks on the damaged (lower) side first (or removing cargo higher up) to lower the CG.

MARS 202124

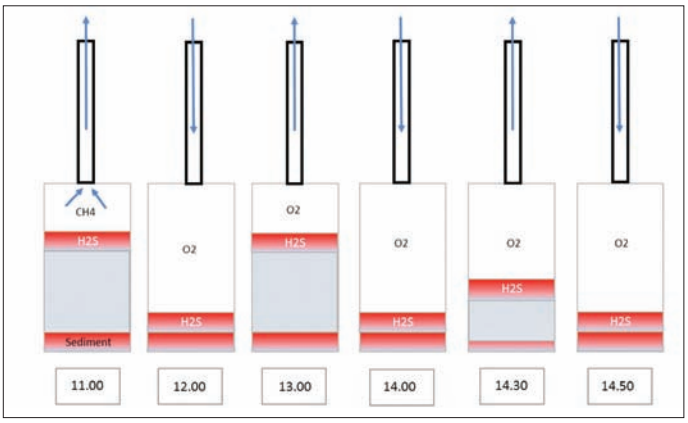
Enclosed space: Deadly H_2S goes undetected and rescue attempts are haphazard

As edited from the AIBN (Norway) report Marine 2020/02

➔ A factory trawler was underway and being made ready for fishing. Crew had finished cleaning the factory and were preparing the silage tanks for cleaning. Silage tanks are special compartments that contain unused fish parts that are processed into silage and later pumped ashore (used to make oil and protein concentrate used in feed for farmed fish). The tanks had last been cleaned about five weeks earlier and there was still silage residue at the bottom of the tanks. Cleaning these tanks included preparatory work such as flushing the tanks by filling them with seawater and emptying them several times and then lowering a fan into the tank to ventilate. The usual method was to lower the fan into the tank using a rope.

Access to silage tank

Flushing was accomplished as per the below diagram (not to scale). For the ventilation, a plastic hose was attached to the blower to channel the gases out into the open air. It had previously been a challenge to prevent the hose getting twisted when the fan was lowered, and it was decided to send someone into the hold to position the fan correctly, if safe. The oxygen level in the tank was measured by lowering an oxygen detector on a string, but it is not known how far down the tank it was lowered. The oxygen detector did not sound an alarm, and therefore it was deemed safe to enter the tank.



Two crew rigged the fan and hose. When the equipment was ready, one crew member with an oxygen detector entered the tank. After descending part of the way the fisherman shouted to his colleague on deck that there was a lot of silage residue left in the tank; he then proceeded down to the bottom of the tank. Suddenly, he shouted 'There is no air here' before jumping back onto the ladder. After a few steps he abruptly fell backwards, landing at the bottom of the tank, unmoving and face-down in the silage residue.

The crew member outside the tank raised the alarm and one of the vessel's Breathing Apparatus (BA) sets was brought to the access hatch. Within minutes, the BA was donned and a crew member descended into the silage tank. He shouted up to throw down the end of a fire hose that he planned to use to hoist the victim up. Another crew member wearing a BA entered the tank, and the two of them attempted to fasten the hose around the victim, with limited success.

By the time the vessel's lifting equipment was lowered into the tank, the first crew's air ran out and he had to exit. Another crew member wearing a BA entered the tank and, together with the remaining rescuer, tried to secure the strop around the victim. They found the task very challenging as the victim repeatedly slipped out of the strop because he was unconscious. Finally, as they were hoisting the victim up, his inert body was caught repeatedly on the ladder cage. Another 20 minutes passed before they finally managed to get the injured person out of the tank.

When the victim was finally retrieved from the tank, CPR was immediately performed and attempts were made to resuscitate him using a defibrillator. This work continued non-stop, with most of the crew involved, until medical personnel from the local Coast Guard arrived. The medical personnel ascertained that the injured person had died and CPR was discontinued.

The investigation found, among others, that:

- The gas detector in use measured only the level of oxygen present. It was therefore not possible to determine whether the atmosphere was safe from other deadly gases such as hydrogen sulphide (H_2S) which is produced by bacterial decomposition of organic compounds containing sulphur such as, for example, the fish and fish waste in the silage tanks.
- The fisherman was probably exposed to a fatal dose (one or two breaths) of toxic hydrogen sulphide gas as he climbed down to the bottom of the tank.
- Efforts to rescue the victim from the tank were stymied by the lack of suitable equipment and training.

Lessons learned

- Enclosed space rescue is a specialised endeavour that requires specific equipment, training, and practice. Improvised rescue attempts put the victim and the rescuers at risk. SOLAS requires that crew members with enclosed space entry or rescue responsibilities participate in an enclosed space entry and rescue drill at least once every two months.
- Practising enclosed space rescue without the proper training and equipment is, at the minimum, an exercise in futility. At worst, this could engrain unsafe practices, putting the rescuers at risk.
- A best practice would have at least one crew member on the vessel who has attended a specialised enclosed space rescue training course. That crew member could act as enclosed space rescue team leader as well as on-board trainer.
- SOLAS requires testing enclosed spaces with a multi-gas detector which includes H_2S prior to entry. Testing for O_2 content alone is not enough to allow safe entry into many confined spaces.
- For deep tanks, tests should be made and recorded for several levels including at the bottom.
- Another best practice is to have BA equipment ready for use at the enclosed space entrance before anyone enters that space.
- Finally, best practice would see anyone and everyone who enters an enclosed space first fit a safety harness with evacuation rings. This greatly facilitates any rescue should they be injured or incapacitated while in the confined space.
- All enclosed spaces should have a lifting lug positioned above the entry point or have the space available around the entry for a rescue tripod to be rigged.
- When the opening to a confined space is limited and/or the person being rescued is bulky such that passage through the exit space or up the ladder is hindered, the arms of the victim must be kept above their head as they are being winched up, either by the person themselves or, if the victim is unconscious, by the rescuers using a second line and a wrist strop.
- Although ventilation is more efficient using a positive pressure approach (fan pushing fresh air into the compartment), when circumstances dictate, a negative pressure approach can be used by extracting contaminated gases from the space.

MARS 202125

Messenger line snaps, injures crew

A bulk carrier was berthing, using a combination of ship's and shore lines. The lines from shore were brought on board with the help of a long messenger line, which was placed on the warping drum to heave in. Once the shore line had been heaved onboard it was placed on the bitts.

At one point, one of the deck crew wanted to slacken the messenger but unintentionally heaved the messenger line instead of slacking it. It parted and struck his legs violently. He was not standing behind the controller guards at the time, and was not looking at the winch while activating the control. Additionally, the messenger line could have been simply uncoiled manually from the warping drum without use of the winch.

Lessons learned

- Even a 20mm messenger line can cause serious injury if it fails under tension.

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- Don't stand in the potential 'line of fire' of a line under tension.
- When operating a winch controller, stand behind the guard structure if one is fitted.
- Concentrate on the task but keep your general situational awareness keen.

MARS 202126

Pilot ladder failure

A vessel had been discharged and was ready to depart. A pilot had been ordered and had arrived via a small boat, boarding the vessel from the sea side. As the pilot stepped from the last rung of the pilot ladder onto the deck, one of the side ropes suddenly broke. Luckily, due to the fact the pilot had his weight and leg on the main deck, he did not fall.

Lessons learned

Pilot ladder defects are, unfortunately, a fairly common problem even today. The lives of persons using such ladders depend on a reliable, safe equipment. Ladders should be scrupulously inspected at regular intervals and any hint of defect corrected or the ladder taken out of service.

MARS 202127

Accommodation ladder wire rope fails

The vessel had finished berthing and the deck crew were deploying the starboard accommodation ladder for shore access. As the ladder was being lowered from its stowed position, the wire rope parted about two metres from its inboard end near of the outrigger's outboard guide sheave. The gangway fell and hung vertically along the ship's side. Fortunately, no one was injured and the ladder was recovered and secured. The wire had been installed 29 months earlier and had recently been inspected with no defects found. It was also reported that all rollers and moving fittings were able to turn freely without any signs of defects.

The company's post-incident investigation found that the wire's external condition appeared good. However, its internal condition was found to be poor, with corrosion evident.

Lessons learned

- Inspecting wire rope for internal defects is especially difficult but can be achieved in many cases by opening the strands with a marlin spike.
- Particular attention should be given to splices and any 'hidden' points of the wire ropes, such as in the rollers, especially at points where little or no movement takes place under normal usage.

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