MARS – Lessons Learned

MARS Report No 365 March 2023

MARS 202311

Procedural shortcut undercuts quality

➔ A tanker was in port to discharge two separate parcels of cargo to the shore terminal in sequence, one after the other. The chief officer completed the company's valve line-up checklist and the cargo handling plan (CHP) as per the company Safety Management System (SMS). All deck officers and ratings read and initialled the CHP and attended the cargo handling briefing.

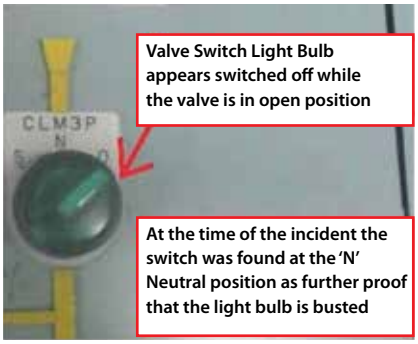

Photo 1

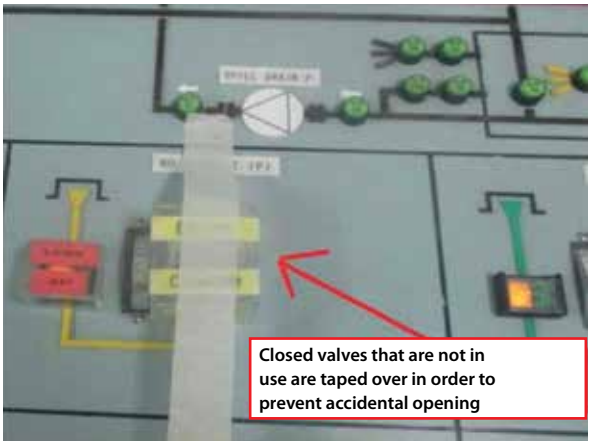

Photo 2

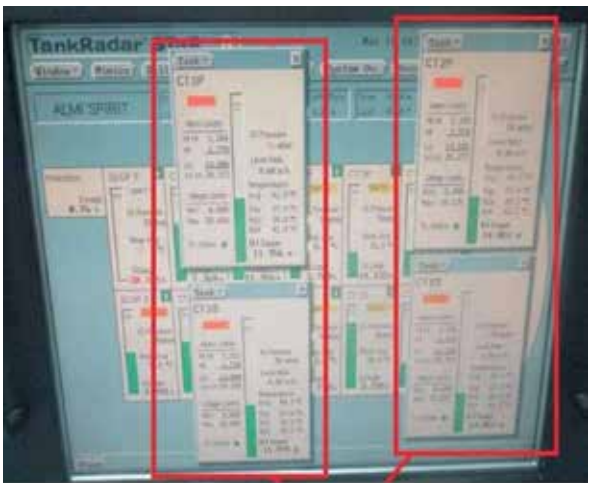

Photo 3

Unknown to those on board, the valve to the tank containing the second parcel had been left open after cargo loading and draining of the cargo arm. This remained unidentified for reasons that are explained below. Once the first parcel had been unloaded it was discovered that product from the second parcel had been discharged simultaneously with the first, contaminating both parcels.

The investigation revealed several unsafe conditions that allowed this incident to occur.

- The light indicating that the tank valve is open was defective. When the vessel arrived at the discharge port, the fact that the light was off was taken as an indication that the valve was closed. (Photo 1, left)
- It was standard practice that when more than one parcel is loaded, the valves that are not being worked are protected by a plastic cover which is secured in position with tape. This precaution causes its own unsafe condition; making harder to visually check the actual status of the valve. (Photo 2)
- The pre-arrival checklist asks, among other things: 'Have all cargo lines/valves been checked?' The Chief Officer is expected to open and close all cargo valves to validate their operational condition before the cargo operation begins. Due to the demanding trading pattern and the frequent port calls, the good operating condition of the valves had been frequently validated. This created a false sense of safety and inclined the chief officer to skip checking each and every cargo valve before the operation. As a result, the forgotten open valve of the load port was not identified in time.

Other 'barriers' in place to allow timely identification of any deviation from the plan were also sidestepped or otherwise annulled:

- The digital cargo level gauging system screen was rearranged so that the display for the first parcel was shown on top of the other tank readings. It was therefore difficult to see the change in quantity of the second parcel that was being simultaneously discharged. (Photo 3)
- The junior deck officers did not check/record the ullage of the second parcel during the discharge of the first parcel. They assumed that the ullage of the second parcel would remain the same during the discharge of the first parcel so they pre-entered the expected ullage values for the tanks in the discharge progress record in order to save time and effort.

Lessons learned

- Procedures can be (and sometimes are) sidestepped by crew with a mind to ease the workload and accelerate a process. Attention to detail by vessel leaders should nip this practice in the bud before it becomes routine.
- Sometimes, well meaning 'barriers to hazards' put in place by crew, such as the plastic cover protection on the valves of tanks not being worked, can have unexpected negative consequences.

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MARS 202312

SART detection reduced when search Radar on AUTO mode

As edited from USCG (USA) Marine Safety Alert 12-22

➔ During a recent marine search and rescue incident, a survivor was drifting in the water holding an activated 9 GHz (X-band radar) Search and Rescue Transponder (SART). The survivor saw four vessels pass close by as he held the SART above water, but none of the vessels' crews detected the SART on their radars.

The survivor was finally rescued after three hours in tropical storm-like conditions. After the incident, the survivor's SART was tested. It was found to be in good condition and operating in accordance with all requirements for a 9 GHz SART. So, what went wrong?

The post-incident analysis revealed the X-band radar settings that are optimal for navigation might actually prevent the SART signature from displaying on a searching vessel's radar screen. The gain, sea clutter, rain clutter, and tuning on X-band radars are commonly operated in Auto mode, but this was found to drastically reduce or completely eliminate the ability of the receiving radar to display the dots or circular lines that indicate the SART's position.

In addition, the orientation of the SART antenna and the height of the SART above the water both affect the ability of an X-band radar to detect a SART. The SART is designed to free-float or to be mounted on a pole in a life raft or on a survival craft. This height above the water will improve the device's ability to transmit and receive signals, while also providing a much better target than a SART floating in the water.

The narrow end of a SART is the antenna. This should be vertical and as high as possible. But the narrow end is also the only suitable location for a person in distress to firmly hold a SART. If a person in the water holds a SART by its antenna, the SART's ability to transmit and receive signals from an X-band radar will be reduced.

Lessons learned

- If you are on a vessel that has been assigned search and rescue duties and are searching for possible survivors, do not use the AUTO mode for radar rain, sea and gain settings. Use the manual modes and adjust the rain and sea clutter settings to the lowest possible setting that will still give a somewhat clear screen. The gain should be put to the highest possible adjustment without causing undue radar returns that pollute the screen.
- If you are a survivor floating in the sea and have an activated SART in hand, hold it as high as possible above your head but do not use the narrow end as a handle. This is the antenna.
- If you are a survivor in a lifeboat or liferaft, mount the SART as high as possible with the narrow end up.

MARS 202313

Shifting anchorage position ends in disaster

As edited from the Republic of Liberia report published on December 20, 2019

➔ A loaded bulk carrier arrived at an anchorage off a busy port. Once at anchor, the plan was to use the ship's cranes to discharge the cargo of scrap steel into self-propelled lightering barges made fast alongside both sides. After the cargo lightering operation had begun, the vessel was observed to be dragging anchor in a southerly direction. There was a low under keel clearance and strong currents, so the main engine was used to slow the movement of the vessel. Despite this, the cargo discharge operation to the barges continued apace.

Discharging operations had been ongoing for about three days when the local Port Control called the vessel and instructed them to reposition their anchorage position because they had by now dragged too close to the pilot boarding area. The plan was to lift anchor and move back to the initial anchorage spot. The Master decided to continue cargo discharge into the three barges moored on both sides of the vessel while making the move under slow engine.

As the vessel was about to drop anchor at the planned position, Port Control advised the vessel not to re-anchor there, but to go to a position further out. As they made way towards the new position, the combination of strong tidal current astern (approx. 1.5kts), the slow speed of the bulk carrier and the added drag of the barges on both sides made manoeuvring more sluggish.

It became apparent that course made good was bringing the bulk carrier into a collision situation with an anchored vessel. In a desperate attempt to avoid contact with the anchored vessel the engine was increased to half ahead and then full ahead and hard port helm ordered. The bulk carrier nonetheless made contact on its starboard side with the other anchored vessel. The lightering barge that was moored on that side sustained major damage and foundered within five minutes. Some of its crew jumped into the water and were recovered. Unfortunately two crew were trapped within the sinking barge and were later declared deceased.

Lightering barge foundering after contact

Lessons learned

- Good seamanship would normally see the lightering operations halted and the barges released prior to weighing anchor and re-positioning the vessel. This would have increased manoeuvrability, possibly allowing the move to be accomplished without incident. No fatalities would have been sustained even had the collision nonetheless occurred.
- Low under keel clearance will cause increased drag forces on a vessel and can initiate dragging anchor when all other factors seem benign.

MARS 202314

Mobile phone distraction – huge salvage extraction

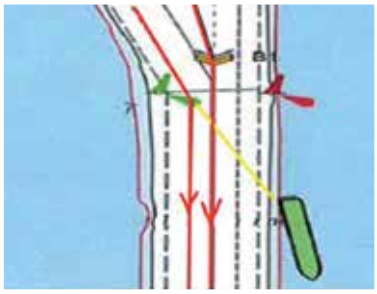
As edited from US Coast Guard (USA) MISLE Activity Number: 7412263

➔ A large container vessel left port outbound under pilotage and was underway in a restricted waterway in darkness. The pilot was using his Portable Pilot Unit (PPU) as the primary means of navigation, as was his practice – he cited reliability and other issues with equipment that was not his own as his reasons for preferring this. However, no equipment failures had been cited on this vessel. When the relieving OOW came to the bridge, the pilot was conning the vessel but was also on his mobile phone on a personal call, as he had been for the past 47 minutes. About eight minutes after the new OOW had relieved the previous OOW, the pilot finished his call and ordered full ahead.

Very soon after ordering full ahead the pilot made another personal call on his mobile phone lasting approximately four minutes and sent a text message image to another pilot on non-urgent business matters. As the vessel approached a course alteration point the pilot ordered a heading of 161°. The helmsman confirmed this order. About two minutes later, the pilot viewed another screen on his PPU with the intention of taking a screenshot from another voyage. This action had the effect of distracting the pilot; he was now preoccupied with saving the screenshot and sending a non-urgent business email to another pilot. Meanwhile, the vessel crossed the inbound lane, overshooting the next course alteration to starboard.

The OOW voiced his concern, stating that the vessel's heading was 161° and speed was approximately 13 knots. The pilot, looking at his phone, verbally acknowledged the OOW but took no action. The OOW then informed the pilot that the pilot's PPU did not match the ship's ECDIS – in which he was correct, as the PPU was still showing a previous voyage that the pilot wanted to make a screenshot of. The pilot put away his mobile phone and began to use the ship's ECDIS, ordering first 15° starboard rudder, then hard to starboard approximately 20 seconds later. The vessel grounded in the mud outside the channel soon afterwards.

Various initial salvage efforts with the vessel's own engines and then with tugs in the hours and days that followed the grounding failed to re-float the vessel. The salvage operation finally required dredging operations around the vessel and the removal of 505 containers. The vessel was finally refloated some 35 days later.



Intended route(s)

Actual route

Lessons learned

- Whether you are a pilot, OOW or Master – if you are in the wheelhouse and assisting or conning a vessel keep your mobile phone in 'airplane mode'.
- The concept of 'challenge' in Bridge Resource Management (BRM) is an important one. In this case the OOW knew they were running into danger but his first 'challenge' to the pilot was understated and oblique. He only restated the facts of their present course and speed, hoping to stimulate an action from the pilot. When the action did not come the OOW then remarked that the pilot's PPU image was not the same as the vessel's ECDIS. The two minutes that were lost during the intervening time were probably enough to have saved the grounding had the action come immediately after the first 'challenge' from the OOW.
- An example of a diplomatic yet firm and unambiguous 'challenge' could be: 'Mr Pilot, we are running into danger and our speed is 13 knots – we seem to have missed the course alteration point'.

MARS 202315

Routine task ends with fall

➔ A vessel was at anchor near a port. As part of regular maintenance checks, a member of the engine room crew went into the funnel space to verify whether the funnel flaps were working. In order to do this he installed a ladder in the relatively confined space and climbed up, unassisted. He slipped from the ladder and fell to the deck. He suffered multiple minor injuries for which he had to be evacuated to a shore hospital.

Reenactement of victim's final position

Lessons learned

- Routine, everyday tasks can be deceptive; we tend to discount the potential harm of hazards we have successfully avoided in the past.
- A rule of thumb when using a ladder: have a second person hold the base while you climb. It is generally accepted that if the height of your climb is greater than 2/2.5 metres, use a safety harness.

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