Mariners' Alerting and Reporting Scheme

MARS Report No 358 August 2022

MARS 202232

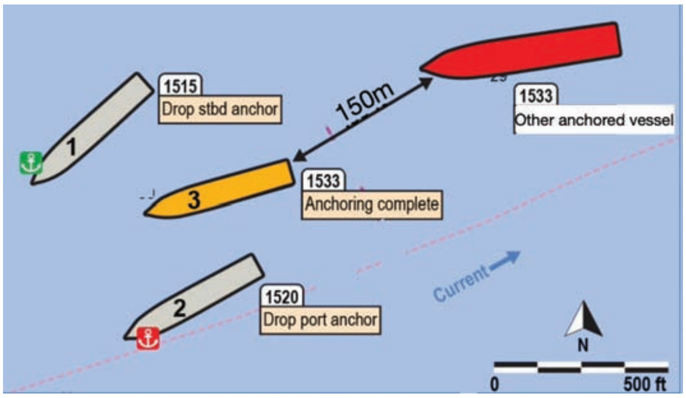
Two anchors are not always enough

As edited from NTSB (USA) MAB-21/15

➔ A loaded general cargo vessel had left berth but went to anchor in the river for repairs before proceeding to sea. The pilot showed the Master and Chief Officer his intended anchoring position on the ship's ECDIS and informed them of his plan to use both anchors, establishing a 'good spread' between the port and starboard anchor chains. There were thunderstorms forecast for that afternoon that could bring strong and gusty winds to the area and river water levels were high, causing an outflow current of about four to five knots.

The starboard anchor was let go (position 1 in the diagram). The vessel then manoeuvred to port and, five minutes later, the port anchor was also let go (position 2). The starboard anchor was heaved to four shackles on deck and the port to three shackles in the water. About 15 minutes after the port anchor was let go the pilot informed the Master that the anchoring was finished. The pilot was satisfied with the situation (position 3), but recommended keeping the engine on short standby due to the inclement weather that was due to arrive and the strong river current. Another issue was that the vessel's stern was only 150 metres from the bow of another ship anchored astern (shown in red in the diagram).

The pilot left the vessel a few minutes later. Unknown to him, the vessel was not in a stable condition and continued to yaw between the anchors.



Even though the vessel astern was only 150 metres away, the OOW set the anchor watch alarm on the ECDIS for a radius of 180 metres. Soon, the vessel was moving astern at a speed over the bottom of about 1.8 knots. At 1602 there was a watch handover; the relieving officer, unfamiliar with the vessel's ECDIS because he was new, asked why the ship was not in the middle of the ECDIS 'anchor watch' circle. The officer being relieved offered to help familiarise the relieving officer with the ECDIS, but they did not further discuss the vessel's position at anchor as they went on to other business. About 10 minutes later, the OOW aboard the vessel anchored astern called on VHF radio giving a warning – he had noticed that the general cargo vessel was moving astern toward his vessel.

At 1639, the OOW became aware that they were now too close to the other anchored vessel. He contacted the engine room and engine control was received on the bridge nine minutes later. The Master began using full ahead engine, along with the bow thruster and rudder, to reduce the swing and bring the ship ahead. By this point, the ship was unable to turn to starboard away from the other anchored ship. At 1655, with the first vessel now broadside to the current and pushing on the bow of the other anchored vessel, both vessels were now dragging anchor.

Tugs were requested to help hold and stabilise the vessel. The first tug arrived on scene about 30 minutes later. A further 30 minutes passed before pilots arrived on both vessels, but more tugs were needed to extricate the vessels from their position. Although these arrived some time later, the vessel nonetheless hit a shore dock at a speed of 6 knots before its bow grounded on the river bank. Damage to the two vessels and the dock were estimated at $16.9 million.

Lessons learned

- The first minutes after anchoring are important. Special attention should be given to ensuring the vessel's anchors are indeed holding and the vessel is stable.
- Given the distance of just 150 metres from the stern of the vessel to the bow of the other anchored vessel, the anchor watch alarm radius setting of 180 metres was too large to provide a timely alarm of the ship dragging.
- When at anchor, all means to detect vessel movement should be employed. In particular, the radar should be used to crosscheck ranges to shore or other anchored vessels.
- In this case, there were four shackles on deck on the starboard anchor and three in the water on the port anchor. Best practice with opposing forces ahead (such as in a river current) would be to have equal amounts deployed on each chain to avoid unequal distribution of stress. Unequal distribution of stress could result in one anchor taking the load, then dragging and putting the load on the other anchor, which in turn takes the load, and then drags. This in effect nullifies the advantages of deploying two anchors.

Readers may remember another recent MARS report where dragging anchor in a crowded anchorage caused problems; M202216.

MARS 202233

Berthing lines – embedded hazards

➔ During berthing operations at a loading terminal, the line-handling crew were surprised to find metal rings and tags entwined within the yarns and strands of a vessel's lines. These objects present a potential catch point and/or finger entrapment hazard for anyone handling the lines. There is also a risk that these objects could detach and become projectiles when lines are under load or when lines are being run. This was the fourth vessel in six months to have lines with such hazards. The terminal authorities grew concerned and made a MARS report.

It is likely that the rings and tags are items associated with materials used to pack the lines themselves. It is also possible that these objects could have become embedded within the lines during usage.

Lessons learned

- When bringing a new line into service, ensure all packing and extraneous materials are removed from the line before use.
- It is good practice to observe and inspect berthing lines at every use; as they go out and when they come on board. The inspection should cover the general state of the line, but be aware of any objects that may embed themselves into the fibre of the rope during usage.

MARS 202234

Sleep inertia can be costly

As edited from NTSB (USA) report MIR 22/09

➔ A tug was pushing two steel tank barges loaded with naphtha on an inland waterway. The Master had been at the con/helm for several hours before retiring to his cabin for some rest. About 4.5 hours later, a little after 0500, the Master awoke and proceeded to the wheelhouse to assume the watch, even though his watch normally started at 0600.

The tow was approaching the eastern end of a lock when the Master entered the wheelhouse. The officer offered to take the tow through the lock before turning over the watch, but the captain declined and took the con/helm about five minutes before manoeuvring the tow into the lock. The officer informed the Master that he was having trouble communicating via handheld radio with the deckhand, who was stationed on the lead barge.

The Master reduced speed on the engines, keeping them 'in clutch' ahead to provide steering control as the tow neared the long wall on the north side of the lock. The Master's expectation, from experience, was that they would stop and secure in the lock with the bow of the lead barge about 15 metres from the closed gates ahead. However, on this morning, he was not consistently receiving distance reports from the deckhand because of ongoing trouble with their handheld radios.

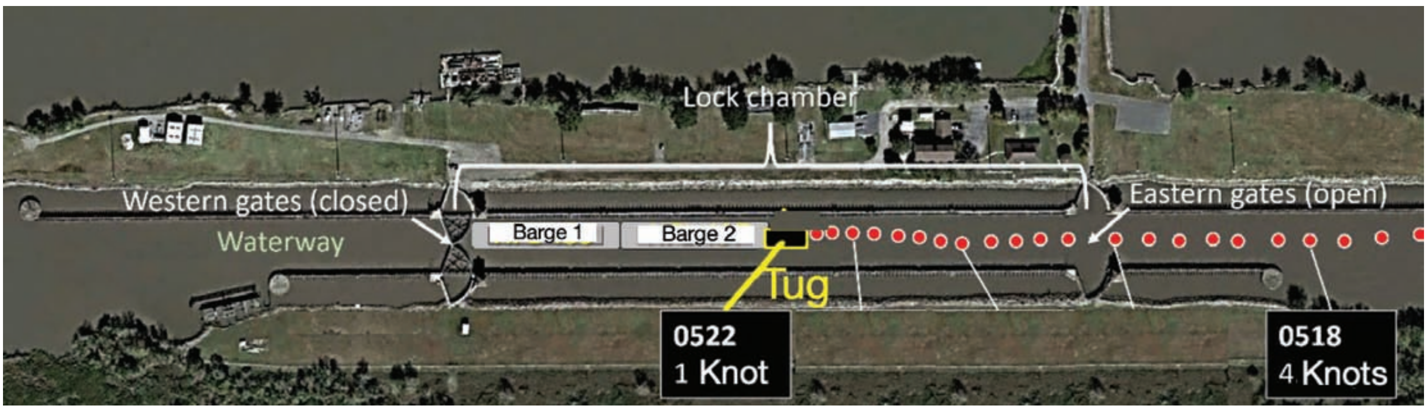
As the Master was manoeuvring the tow in the lock, the GPS feed to his electronic chart system (ECS) failed, denying him his primary source of speed indication. In the darkness, he had to judge the speed of the tow by watching the illuminated lock wall through his side windows and the lock gates through his forward windows.

With the tug and barges now at a speed of about two knots, the Master received a distance report from the deckhand and, realising they were close to the front of the lock, put the engines to full astern. The tow continued to slow but was still making about one knot when the starboard bow of the forward barge (1 in picture) struck the closed western lock gate.

The official investigation found that the Master's performance and decision making were probably negatively affected by sleep inertia. Sleep inertia can be a factor for 30 minutes or more after waking, especially in demanding situations that require high levels of attention and cognitive demand. Further, waking during a circadian low, such as in this case at 5am, and partial sleep deprivation, can amplify the effects of sleep inertia.

Lessons learned

- The company operations manual required that a change of watch was not to occur during 'a critical move'. Examples included operations involving 'bridges, locks, and docking operations'. The requirement is one of common sense and, in this case, does seem fully justified.



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- Fatigue has many negative effects on performance and is notoriously hard to objectively assess by its victims. Sleep inertia is a silent companion to fatigue and mariners would be well served to be aware of its existence.

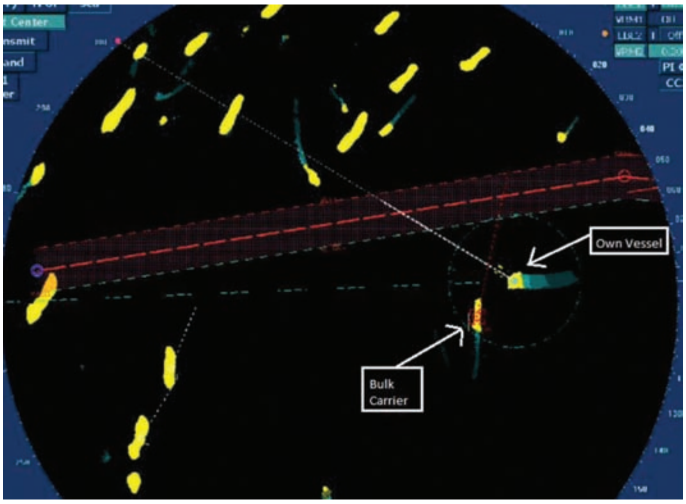
■ **Editor's note:** Accidents rarely if ever happen because of one unsafe condition or unsafe act. This accident is an excellent and clear example of this theory. The Master was possibly under the influence of sleep inertia, but several other factors had to conspire to bring about the end result. It was dark, so visual perception is reduced as compared to full daylight. As has been mentioned before in MARS, darkness changes everything. Additionally, communication with the deckhand forward was problematic and the GPS speed input failed at just the wrong time.

MARS 202235

Near collision – vessels pass at 35 metres

➔ In darkness, a vessel was proceeding to a busy anchorage under the con of a pilot who had just boarded. The pilot and the Master engaged in small talk as they proceeded and there was also an OOW and a lookout on the bridge. Another vessel underway in the vicinity had recently altered course to port and, unknown to the bridge team or pilot, was now in a potential close quarters situation. Almost 10 minutes passed before the potential close quarters situation was observed by local VTS and the bridge team alerted to the danger by VHF radio.

Only now, with the other vessel just 0.3 nm away, was it plotted. There was initially some confusion as to the speed of the other vessel as the value was changing; but this was be expected in the first minute after plotting as the ARPA target acquisition algorithm needs to refine the calculations. Emergency course alterations were made and the bridge team tried to communicate with the other vessel by VHF radio. As the distance decreased between the two vessels, the bridge team, now under some stress, sounded a long blast on the fog horn. Finally, the other vessel passed astern only 35 metres away.



Lessons learned

- A common mistake when a pilot boards is for the bridge team to relax; the unstated assumption is that the pilot has everything under control. Not so! The bridge team must continue to do their jobs in full support of the pilot and visa versa.
- As part of a bridge team, never assume that someone else will see it. It is possible for any member of the bridge team to make an error or miss a cue. YOU may be the only one that identifies a potentially hazardous situation, and for this reason, every bridge team member should be alert.
- The danger signal is at least five short blasts.

MARS 202236

Check your steering gear

➔ A *Seaways* reader, member of The Nautical Institute and experienced navigation assessor, has sent the following note of interest. It is well worth reviewing:

One of the most frequent failures I find during navigation assessments is the testing of steering gear prior to departure from port. The ways in which tests are conducted are an eye opener, and range from (simply) turning on the steering motors and turning the rudder a few degrees each side of amidships through to the full test of all equipment. Often, no engineer is present in the steering flat to observe the mechanical operation and hence many elements of the test are not carried out.

Most of the pre-departure tests take place within one hour of sailing – a time when the Master and Chief Officer are busy with administration tasks and hence no supervision is provided.

I have witnessed occasions where these tests could have resulted in serious incidents had a failure occurred during departure. In the most recent example, a failure did occur but thanks to tugs still in attendance and made fast, a disaster was avoided.

Here is an example of the items to be checked:

- Test of main steering gear;
- Remote steering gear control systems;
- Steering positions on the bridge;
- Emergency power supply;
- All rudder angle indicators;
- Steering gear power failure alarms;
- Automatic isolating equipment;
- Visual inspection of steering gear and linkages for damage and hydraulic leaks.

The regulations governing steering gear are covered in SOLAS Chapter II-I Regulation 29 & 30.

The key issue is a that minimum of two people are required to carry out these checks; a deck officer and an engineer officer.

■ **Editor's note:** Diligent readers of *Seaways* magazine may recall an article that appeared in the December 2007 edition under this editor's byline that suggests bringing the steering gear regulations into line with developing technology. Interested readers can peruse that article, archived here:
http://www.safeship.ca/uploads/3/4/4/9/34499158/steering_gear_performance.pdf
or in the *Seaways* archive online (NI members only)

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