The Swedish Club

Online Loss Prevention Training

Handouts

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1 Case 1 – Grounding in port

It was early autumn, and the feeder container vessel was alongside port side to doing cargo operation with a heading of north-west. With the wind from the west-south-west, this gave a strong beam wind on the vessel's port side. The vessel was fitted with a single controllable-pitch propeller and bow and stern thrusters.



During cargo operations, wind speeds intermittently exceeded crane operating limits, and an electrical fault affected one of the gantry cranes. Cargo work was repeatedly interrupted and delayed. To protect the liner schedule, the charterer decided to advance the departure time, leaving some cargo and reducing the time available on board for final cargo planning, stability work and passage planning.

The master requested a pilot for departure and ordered one tug because of the prevailing wind. No tug type or minimum bollard pull requirement was specified. Port control allocated a conventional single-screw tug with a bollard pull of about 39 tonnes.

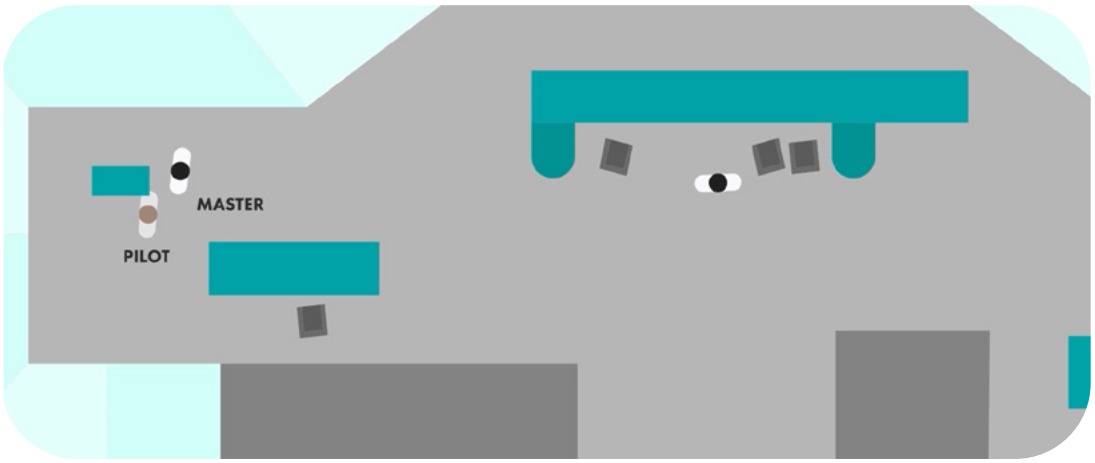


The pilot boarded at about 18:12 local time. A pilot card was completed and the pilot received information on the vessel's particulars and recent port experience. With the master's agreement, the pilot took the conn from the port bridge wing and operated main engine pitch, rudder and thrusters. There was no structured master–pilot exchange discussing the manoeuvring plan, tug positioning, defined abort points, maximum wind limits or emergency options. Bridge team roles were not allocated. The master remained on the bridge, and the second officer was on the stern.

At around 18:30, unmooring commenced. The tug pressed the vessel onto the quay while lines were let go. Once all lines were released, the strong west-south-westerly wind pushed the bow away from the berth more quickly than the stern, leaving the vessel angled relative to the quay.

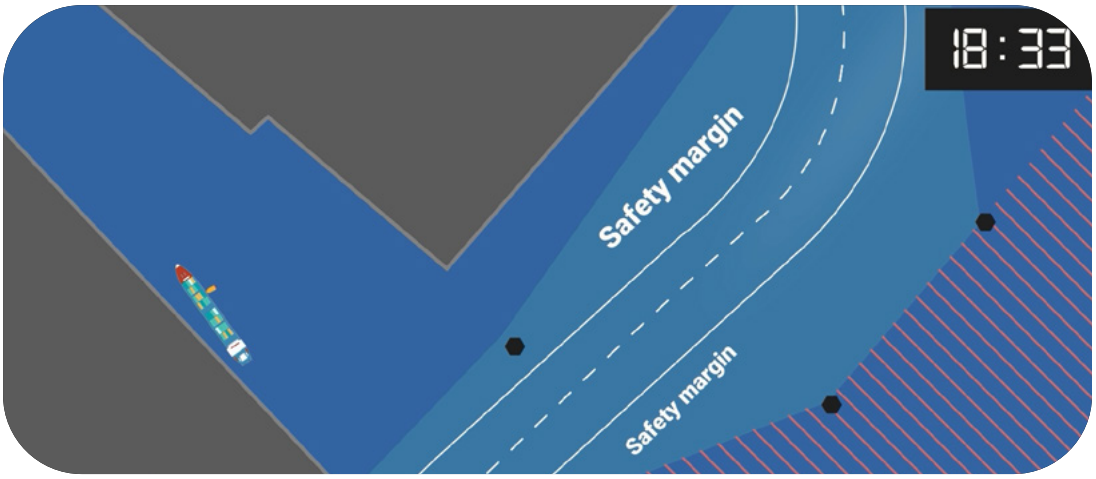


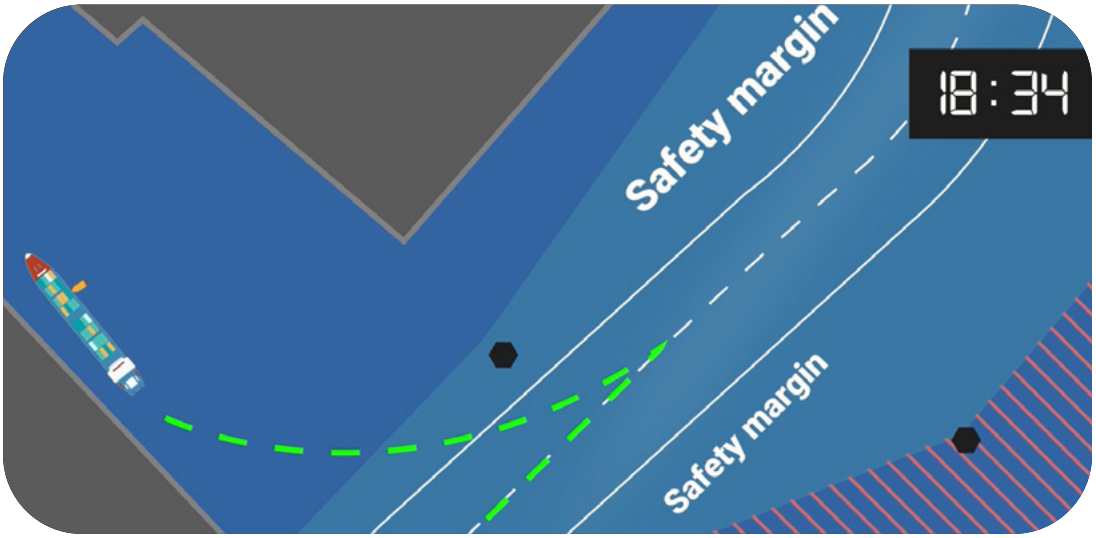
The pilot ordered astern propulsion to clear the berth and begin the manoeuvre into the fairway. The bow thruster was used to push the bow to port with the intention of aligning the vessel with the outbound track. The stern thruster, of lower power and operating in increasingly disturbed flow as astern speed increased, had limited effect.

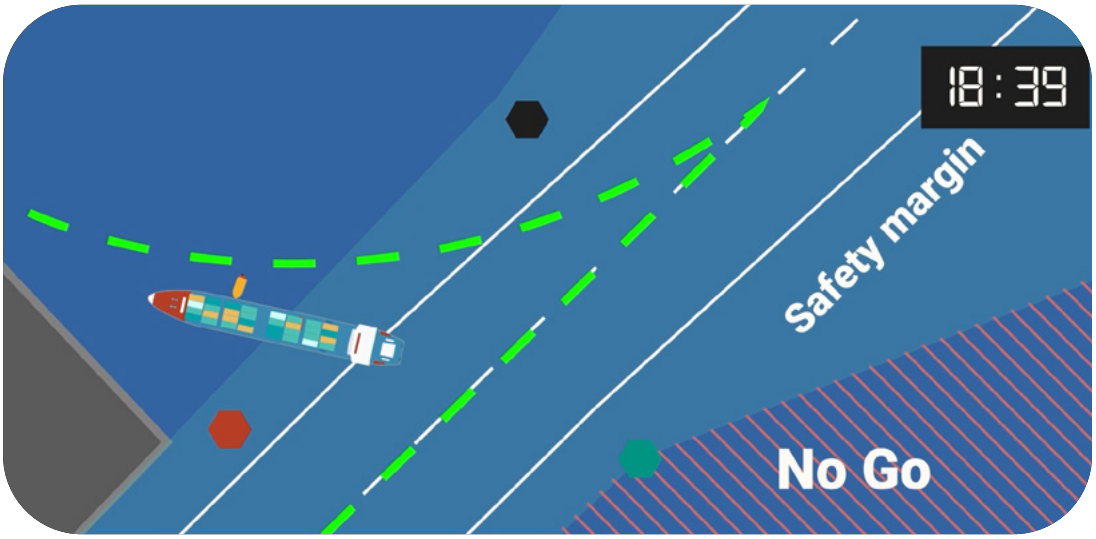


The tug was positioned on the starboard side approximately one-third of the vessel's length from the bow, pushing to assist the swing. The turning basin and entrance to the fairway were marked by a red spar buoy near the quay and a green ice buoy on the fairway's outer edge. The pilot concentrated on ensuring that the bow cleared the red spar buoy while the vessel continued to move astern.

From the aft mooring station, the second officer observed the stern gradually closing on the green ice buoy and repeatedly reported decreasing distances by UHF radio. On the bridge there was limited discussion about the developing situation. During the manoeuvre the pilot took a short mobile-phone call while remaining in control of the conn.

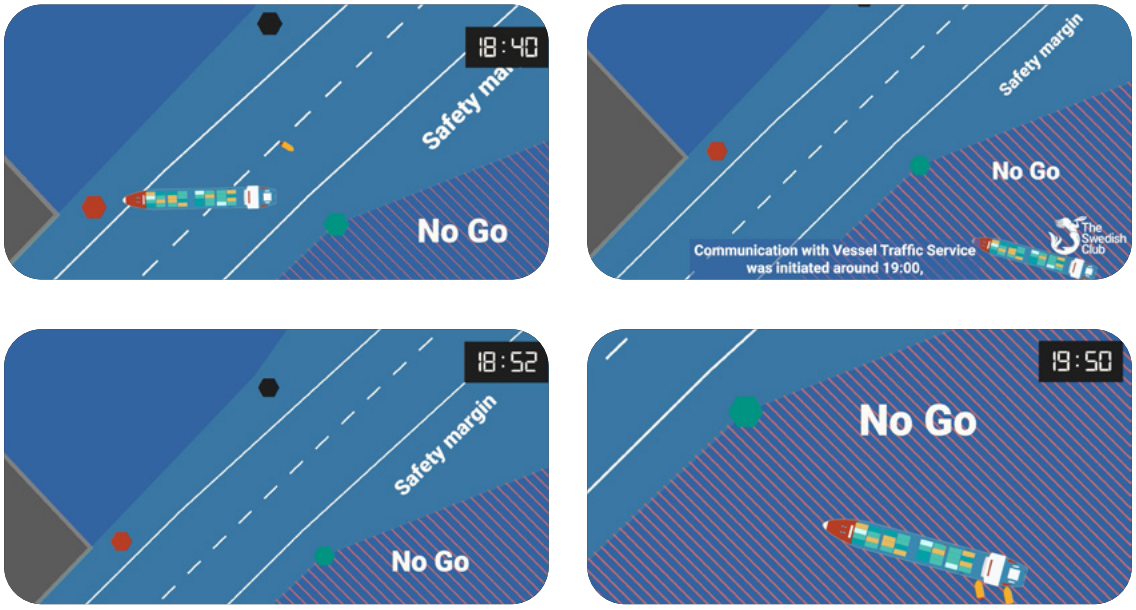






At about 18:42, the stern made contact with the green ice buoy. The buoy was forced under the stern and its structure and mooring arrangements came into contact with the vessel's propeller and rudder. The buoy was heavily damaged and displaced from its charted position. On board, strong vibrations were felt, and it was assumed that the rudder and/or propeller had sustained damage.

After the contact, the vessel's steering response was reduced. The pilot and master had incomplete information about the extent of the damage and were cautious in the use of main-engine power. The tug attempted to reposition but was unable to prevent the vessel from drifting sideways under the combined effect of wind and momentum. The vessel moved out of the fairway towards shallower water.



At approximately 18:54 the pilot suggested let-go the port anchor. The master agreed and instructed the forward mooring team to let-go the port anchor. Difficulties were encountered with tangled chain. Before the anchor was let-go, the vessel ran aground at about 18:57. The grounding was light and there was no reported breach of hull integrity, pollution or injury.

Communication with Vessel Traffic Service was initiated around 19:00, after VTS had observed the vessel's abnormal movements and attempted to call the ship. A second tug, an ASD (Azimuth Stern Drive) tug was dispatched. Working together, the two tugs refloated the vessel at about 19:50 and towed her to an alternative berth, where she was all fast around 20:24.

Subsequent underwater inspections confirmed damage to the rudder stock and blade, deformation and edge damage to the propeller and minor hull indentation in the stern area. The vessel was declared unfit for independent navigation. After discharging remaining cargo, she was towed to a repair yard in another country for permanent repairs and returned to service after an off-hire period of roughly three months.

1.1 Questions

When discussing this case please consider that the actions taken at the time made sense for all involved. Do not only judge but also ask why you think these actions were taken and could this happen on your vessel?

1. Do we have a pre-departure meeting with everyone involved to discuss the plan and what to expect? (These considerations apply to arrivals as well.)

2. If we do, is the departure plan discussed with the pilot and the entire bridge team?

3. In what ways can we improve our current MPX (Master Pilot information exchange) to ensure everyone is on the same page regarding the manoeuvring plan?

4. What are the environmental limits for departure?

5. What specific steps can we take if the planned departure manoeuvre conflicts with sudden changes in weather or equipment status?

6. According to our SMS and company philosophy, should we have delayed departure in this scenario?

7. Do we allow the pilot to manoeuvre the vessel?

8. How do we ensure that, if a tug is ordered, it is sufficient for the prevailing winds?

9. Do we use closed-loop communication on the bridge?

10. How do we encourage every bridge team member to speak up when they notice potential hazards, and how do we ensure their input is immediately acknowledged?

11. What key indicators or cues might we miss if we focus too heavily on one task (e.g., manoeuvring or communication) instead of sharing responsibilities?

12. How do we handle unforeseen personal distractions (e.g., phone calls) on the bridge to maintain collective focus and situational awareness?

13. What are our current procedures for emergency anchoring, and how can we reduce the time and complexity involved in dropping anchor during unforeseen circumstances?

14. Are there any recent near-misses or incidents within our company or the industry that highlight similar risk factors, and what can we learn from them?

15. What in our system do we need to change to avoid this from happening again?

16. What support do we need from management (additional training, updated procedures, more resources) to strengthen our practices?

17. What immediate, actionable steps can we take from today's discussion?

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1.2 What can we learn?

1. Treat the Passage Plan as berth-to-berth, include the turning basin and fairway as integral parts of the plan.

- Use the Passage Plan+ structure:
  - Route plan – including the track through the basin and fairway and the position of buoys and no-go areas.
  - Manoeuvring plan – thruster use, expected rates of turn, speed profile and pivot strategy in the basin.
  - Towing plan – number, type and bollard pull of tugs, positions and modes (push/pull) in each phase.
  - Mooring plan – line configuration for both departure and potential re-berthing.

- Ensure that no-go areas, shallow areas and critical buoys are clearly marked on ECDIS and radar, with safety margins that the whole bridge team understands and has been briefed on. (Passage Plan+)

- Define wind and current limits for each port and berth, taking into account vessel size, windage, available tugs and fairway geometry. Incorporate these limits into company port cards and the Passage Plan.

- Make the towing plan a standardised document embedded in the Passage Plan, specifying for each port:
  - minimum number of tugs,
  - minimum bollard pull and appropriate tug type,
  - discuss positions for each phase with the pilot (initial unberthing, swing, entry/exit of the fairway)

- Ensure that tug orders and intentions are clearly understood on the bridge: if the pilot communicates with the tug in a different language, orders should be repeated in the bridge working language.

- Apply a clear bridge team model: nominate who has the conn, who is monitoring, who is the assisting navigator and who is the lookout. The master retains command and must be prepared to take back the conn when risk increases. (Passage Plan+)

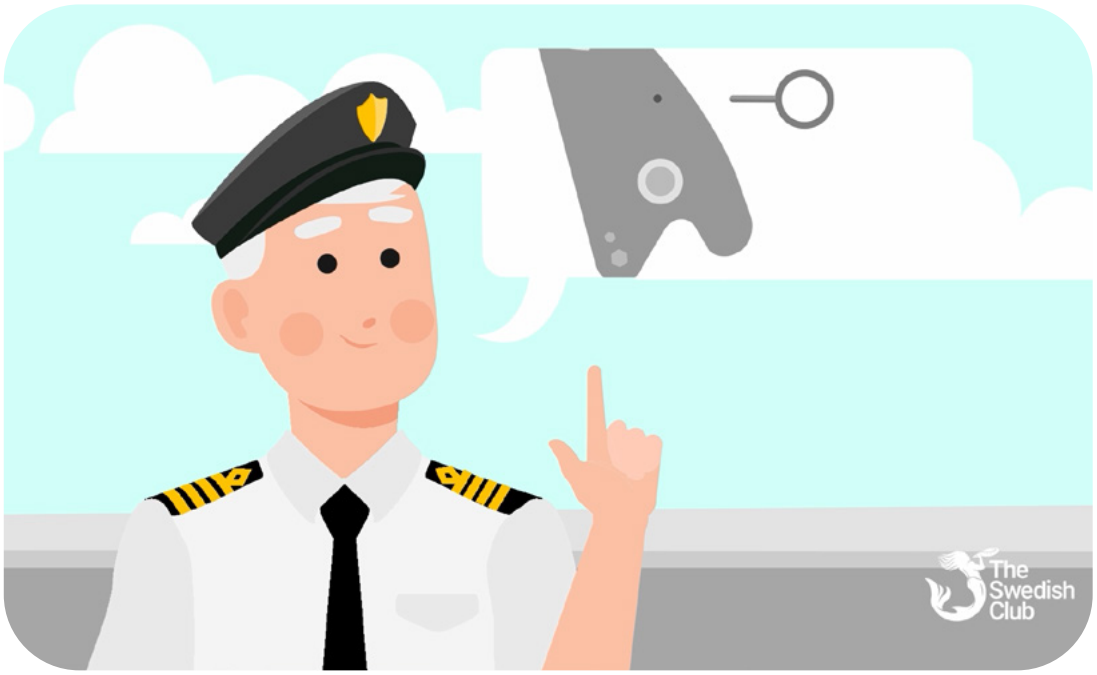
- Use the master–pilot exchange to walk through the passage-phase sections relevant to the port: course and speed profile in the basin, use of thrusters and tugs, environmental limits, abort points and the safety margin.

- Encourage “thinking aloud” by the conning officer or pilot so that intended manoeuvres are announced and can be checked and challenged by themonitoring officer and master. (Passage Plan+)

- Train and use a structured challenge model (such as PACE) so that repeated hazard reports from aft or forward stations trigger escalation and, if necessary, transfer of the conn back to the master. (Passage Plan+)
- Standardise distance reporting from mooring and anchor stations (for example, distance and relative bearing to hazards or quay corners) and require closed-loop communication on the bridge.
- Ensure anchors are ready at departure.
- Conduct regular anchoring drills under realistic conditions, including handling of the chain.
- Use the Passage Plan+ due-diligence approach at fleet level: identify high-risk ports, define practical controls (tug policies, environmental limits, training, port cards) and verify that these are in place on board.
- Maintain and update port cards for regular ports, summarising berth layout, bathymetry, buoyage, typical wind patterns, tug options and lessons from any incidents or near misses.
- After challenging manoeuvres or incidents, carry out structured debriefs and add the findings into port cards, bridge procedures and training programmes.
- When procedures and policies are added ensure, it is as per the 4Ps – Practice, Procedures, Policies and Philosophy. This is defined in The Swedish Club article From Philosophy to Practice – The 4Ps.

2. Case 2 – Rescue boat drill ended with injuries

The vessel was in port and the master wanted to do a rescue boat drill as no drill had been completed since the vessel was delivered about a month earlier. It was a nice day with favourable weather and the harbour authority had given the vessel clearance to launch and manoeuvre the rescue boat in the harbour.

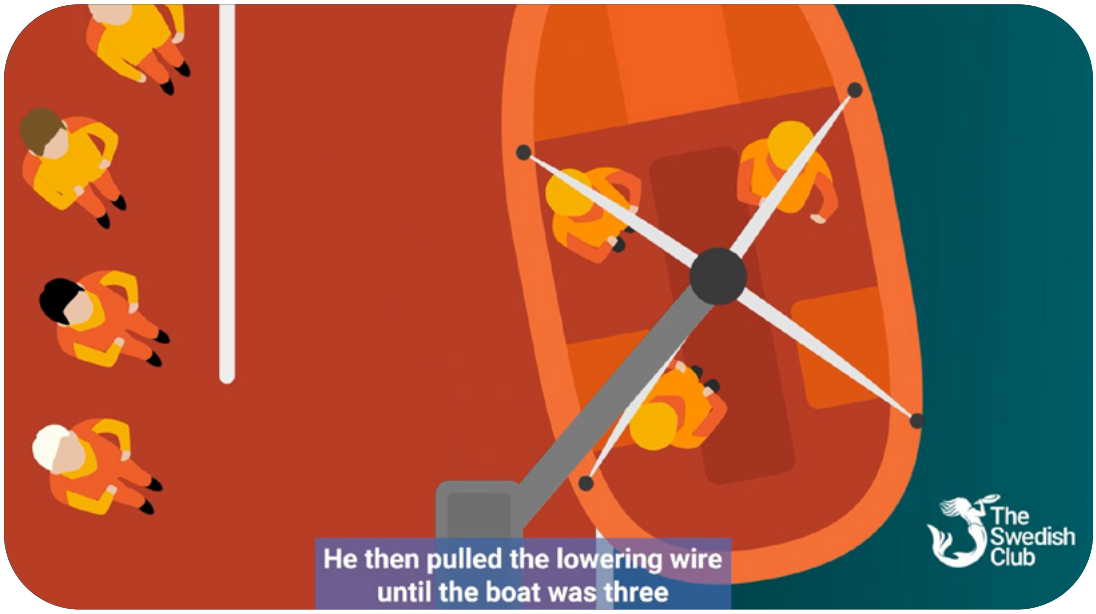


The people assigned to the rescue boat in an emergency were the Chief Officer, bosun, oiler and third engineer. The Chief Officer was in charge of organising the drill. He had joined the vessel in the shipyard about two months before delivery.



During that time he had watched the shipyard complete a rescue boat drill but had not been involved himself.

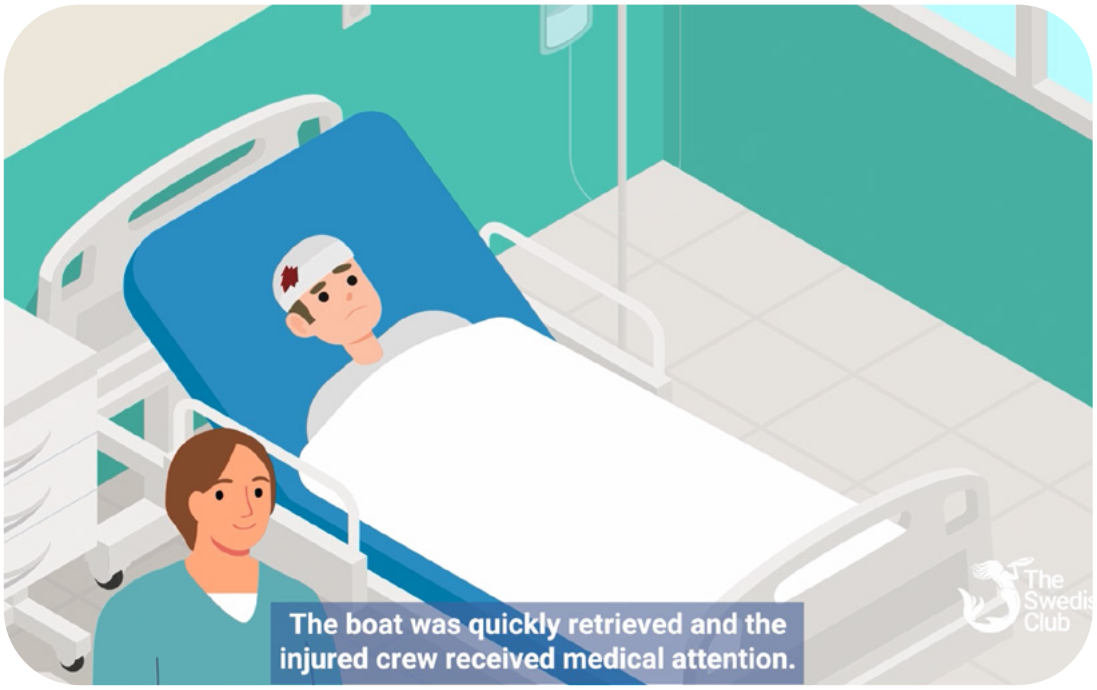
Before the drill commenced the Chief Officer had a short briefing with all available crew and the master. After the briefing, the crew embarked into the rescue boat. The master informed the rescue boat crew that the safety pin should be removed before the boat was waterborne. He did not state at what precise height the pin should be removed but assumed the crew would remove it just before the boat was waterborne.



The Chief Officer pulled the slewing wire until the boat was positioned so it could be lowered. He then pulled the lowering wire until the boat was three meters above the surface, where he removed the safety pin. At the same time the slewing wire, which was hanging free, somehow got caught in the release lever for the hook and caused the boat to drop into the water.



The boat was quickly retrieved, and the injured crew received medical attention. The four crew members were not severely injured. Two crew members had to be admitted to hospital. This was a fortunate outcome as there could have been fatal consequences or really serious injuries.



2.1 Questions

When discussing this case please consider that the actions taken at the time made sense for all involved. Do not only judge but also ask why you think these actions were taken and could this happen on your vessel?

1. What sections of our SMS would have been breached if any?
2. Does our SMS address these risks?
3. How could we improve our SMS to address these issues?
4. Do our procedures make sense for the work we actually do?
5. What in our system needs to be changed to avoid this from happening on our vessel?
6. Do we have a risk assessment for launching of the rescue boat?
7. If we do, could this risk assessment be improved?
8. What were the key procedural failures that led to the rescue boat accident, and how can they be prevented in future drills?
9. What maintenance and inspection procedures should be in place to ensure rescue boat equipment functions correctly?
10. Do we have operating instructions for the rescue boat on load release hook, lowering the boat and the safety locking pin?
11. Do all officers and crew know how to operate and lower the rescue boat?
12. How can communication among crew members be improved to ensure a smooth and safe rescue boat operation?
13. What best practices should be followed when conducting rescue boat drills to minimize risk to personnel?
14. How can a safety culture be promoted among crew members to encourage proactive hazard identification and reporting?
15. What additional training or practical drills could help the crew be better prepared?
16. What support do we need from management (additional training, updated procedures, more resources) to strengthen our procedures?
17. What immediate, actionable steps can we take from today's discussion?

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2.2 Port state findings

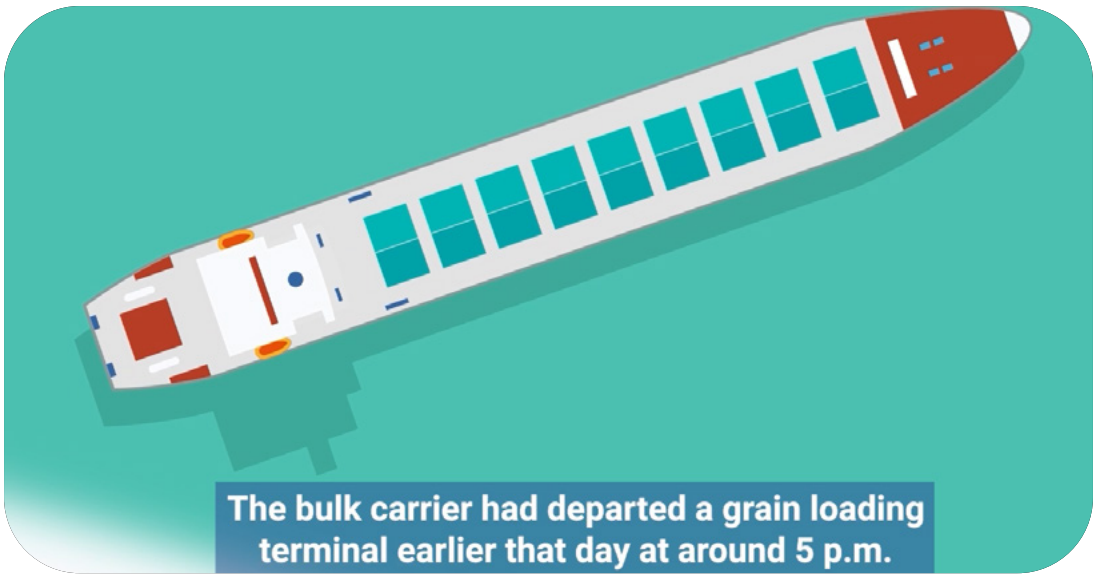
- A port state inspector boarded the vessel to investigate the incident, he raised a couple of deficiencies and was concerned that the safety pin had been removed too early.
- Operating instructions for the rescue boat on load release hook and safety locking pin, not included in SOLAS training manual.
- Operating instructions for control/handling of remote-control wires for slewing and lowering of rescue boat, not included in SOLAS training manual.
- The flag state and classification society were not notified of the accident.
- Rescue boat launching instructions and rescue boat training to be reviewed.

2.3 What can we learn?

- In SOLAS chapter III regulation 35.3 there is a requirement for detailed instructions in the training manual on how the rescue boat should be launched. SOLAS chapter III reg 3.3.6 requires that, if possible, designated rescue boats shall be launched each month with their assigned crew aboard and manoeuvred in the water. In all cases this requirement shall be complied with at least once every three months.
- Follow IMO Circulars MSC.1/Circ.1206 and MSC.1/Circ.1326 for safe rescue boat launching procedures.
- It is imperative to ensure that no wires or ropes get caught in any equipment when the rescue boat is being lowered. The company should ensure that the crew are aware of this risk and implement procedures to prevent this.
- Ensure the risk assessment addresses the risk of wires being caught.
- To make the team more resilient it is important to conduct hands-on training sessions covering release mechanisms and remote wire handling.
- It is essential that all officers know how to launch and manoeuvre the rescue boat and not just the designated officer for an emergency.
- Implement routine maintenance and pre-drill safety checks on lifeboat and rescue boat mechanism.
- Promote a safety culture that encourages reporting and addressing unsafe practices before an incident occurs.

3 Case 3 – Unofficial charts lead to grounding

The bulk carrier had departed a grain loading terminal earlier that day at around 17:00 LT, carrying about 45,000 MT of bulk corn, bound for another port to complete cargo loading before proceeding to ports in the Middle East. The sailing draft upon departure was recorded at 9.78m, adhering to the maximum permitted draft of the day.

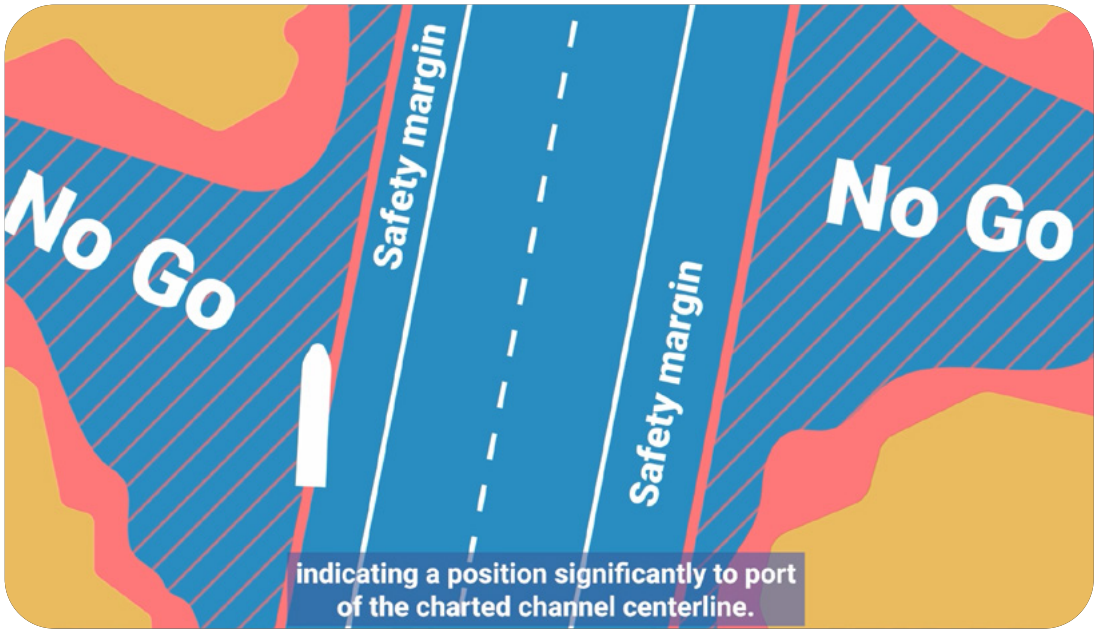




The river navigation was under the command of an experienced local river pilot, assisted by a second pilot. After the harbour pilot disembarked at 19:30 LT, the downriver passage continued without notable incident until 22:01 LT when the vessel was suspected of briefly touching the bottom, prompting the pilot to reduce engine speed to half ahead. Ten minutes later, while approaching the vicinity of a navigational buoy, the vessel's speed dropped rapidly from 8.5 knots to zero, signifying a clear grounding event.



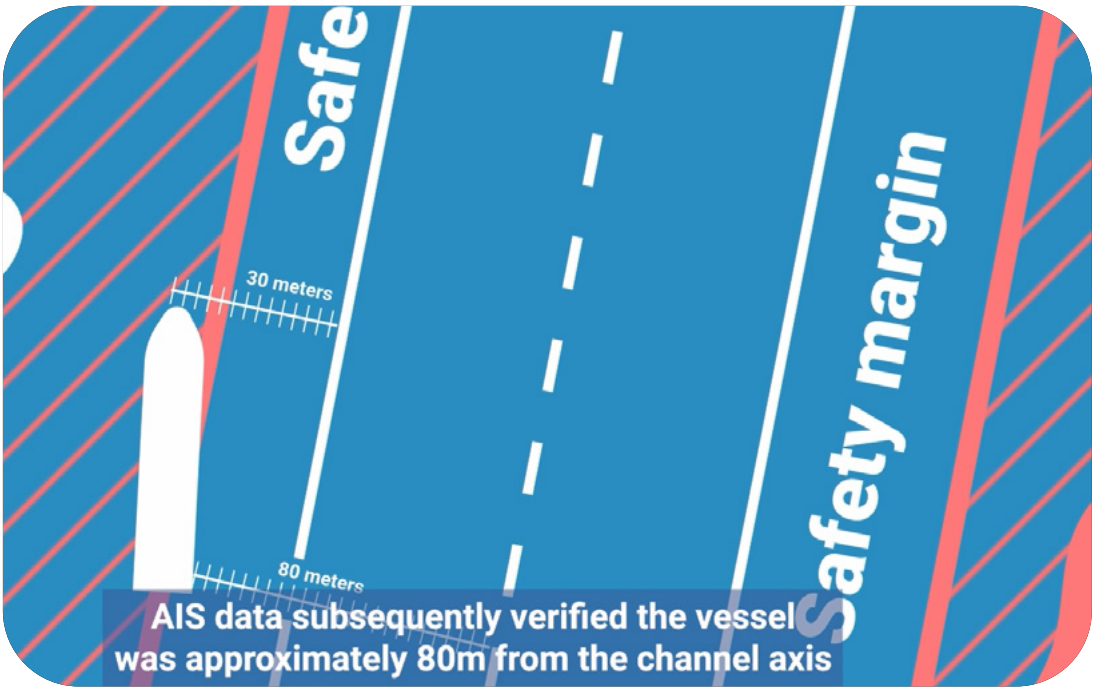
Following immediate unsuccessful attempts to re-float with engine commands of full ahead, hard rudder, and full astern, the vessel officially reported grounding at 22:35 LT. The pilot initially attributed the grounding to insufficient river depth, claiming incorrect tidal information, despite the vessel's ECDIS indicating a position significantly to port of the charted channel centerline. AIS data subsequently verified the vessel was approximately 80 meters from the channel axis and 30 meters beyond the channel limit at the time of grounding.



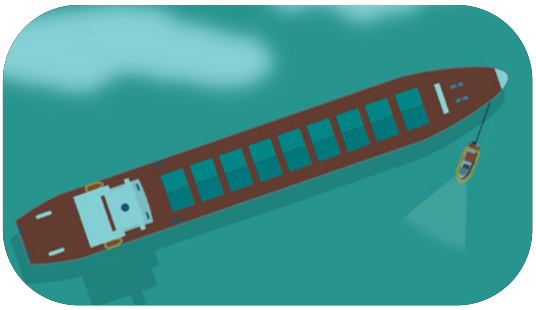
The local Coast Guard responded promptly, boarding at 23:30 LT for initial assessments and confirming no pollution or environmental damage. Due to the urgency of clearing the navigational obstruction, salvage operations commenced promptly. Assisted initially by one tug, and later joined by a second tug, the bulk carrier was successfully refloated the following day at 23:35 LT.

Inspection by the Coast Guard revealed no structural damages or water ingress, leading to clearance for the vessel to continue her voyage.

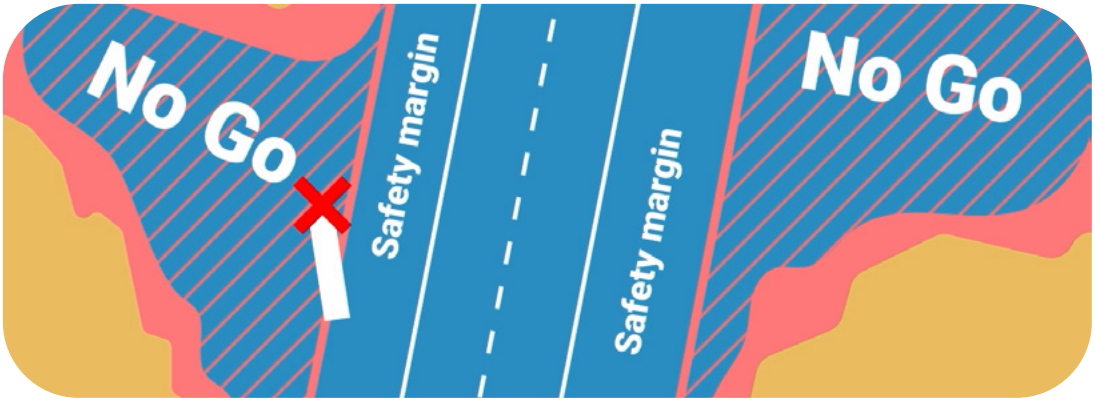
Investigations highlighted significant discrepancies between the vessel's ECDIS display and the pilot's personal tablet-based ENC chart, which displayed the vessel inaccurately positioned within the channel boundaries. Preliminary surveyor findings indicated that the grounding was most likely due to the out-of-date chart utilized by the pilot.



It was noted that the electronic charts displayed on the pilot's and salvage master's tablets were not official navigation charts. According to maritime rules, the only official charts recognized are those displayed on certified ECDIS equipment or official paper charts issued by a recognised hydrographic service.







3.1 Questions

When discussing this case please consider that the actions taken at the time made sense for all involved. Do not only judge but also ask why you think these actions were taken and could this happen on your vessel?

1. Does our SMS address these risks?
2. What specific techniques could help the bridge team maintain situational awareness, especially under high stress and nighttime transit conditions?
3. How could the use of a safety margin have improved the bridge team's situational awareness? (reference The Swedish Club publication Passage Plan+)
4. What steps should be taken when discrepancies between navigational systems are observed?
5. How can reliance on unofficial charts be reduced onboard?
6. Why is it crucial to cross-check pilot-provided navigational aids against official ship systems?
7. What are the responsibilities of the watchkeeping team regarding monitoring vessel position?
8. What immediate corrective actions should the crew take upon detecting positional deviations?
9. In what ways could early or enhanced communication with the pilot have helped identify sailing outside the channel?
10. Do we use the closed loop and PACE when we communicate operational issues on the bridge? (reference The Swedish Club publication Passage Plan+)
11. After a vessel touches bottom , how do we determine if it is safe to proceed further? Who needs to be notified?
12. How might fatigue or stress influence the judgement and reaction times of the crew and pilot during prolonged high-pressure conditions in restricted waterways?
13. Which everyday practices can we reinforce to handle abnormal conditions more safely?
14. How can lessons from this event be transferred to other high-risk navigation areas—rivers, straits, or ports?
15. What immediate, actionable steps can we take from today's discussion?

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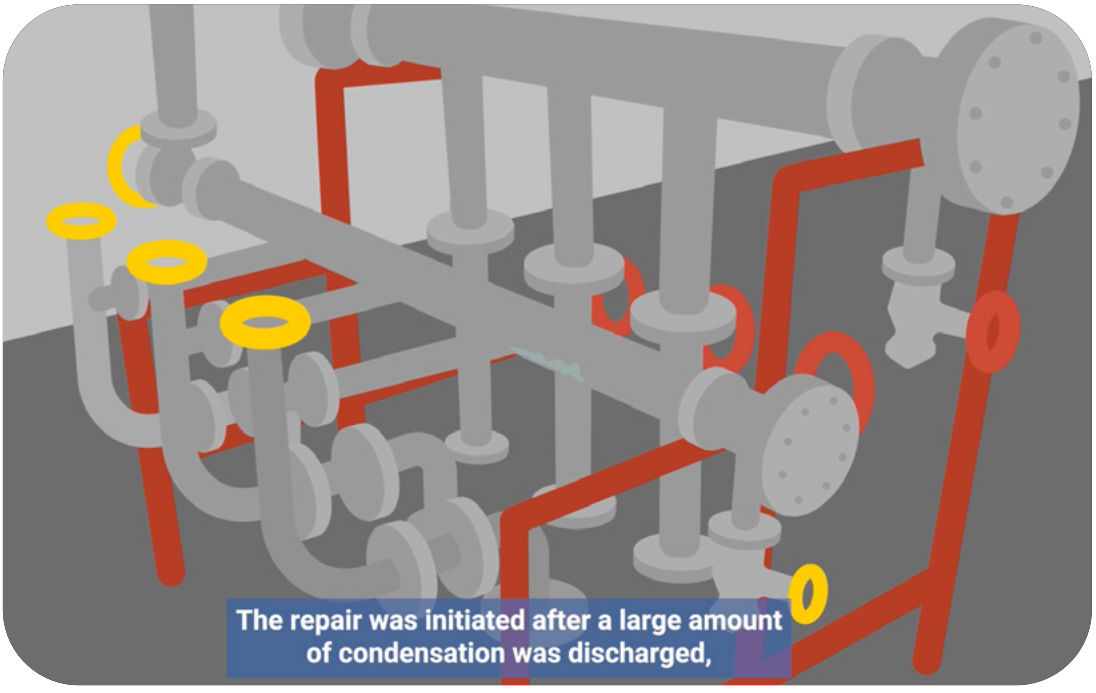
3.2 What can we learn?

- Ensure pilots use verified and regularly updated official nautical charts.
- Reinforce bridge team vigilance in monitoring vessel position against official navigation aids and ECDIS.
- Use radar overlay on the ECDIS.
- Use radar to continuously verify the vessel's position relative to the channel and surrounding navigation aids.
- Maintain a proper and frequent echo sounding watch to detect shallow patches early and confirm under-keel clearance.
- Adjust speed proactively to minimize squat effect in shallow waters and during critical channel transits.
- Use parallel indexing on radar and ECDIS to verify the vessel's track in real time and detect any deviation early.
- Regularly cross-check positions between pilot-provided equipment and shipboard navigational systems.
- Incorporate comprehensive pilot/master exchanges with clear identification of critical navigation points and depths along the intended route.
- Implement enhanced training emphasizing situational awareness and immediate corrective actions upon recognizing positional deviations.
- Prepare contingency plans for immediate corrective actions, including use of anchors, in case of loss of steerage or speed.
- Monitor tide and river level forecasts closely and adjust passage plan when unexpected changes occur.
- Implement relevant suggestions from Passage Plan+
  - Setup no-go areas and a safety margin.
  - Follow a Route plan - This is the track keeping phase of the voyage within a corridor associated with the track.
  - Effective communication is needed in case the pilot makes a deviation from the planned corridor. Use PACE to ask the pilot about his intentions. Establish clear communication protocols between pilot and bridge team, ensuring all helm and engine orders are repeated and confirmed as per closed loop communication.
  - Involve the entire bridge team actively in navigation, assigning clear roles to improve collective situational awareness.

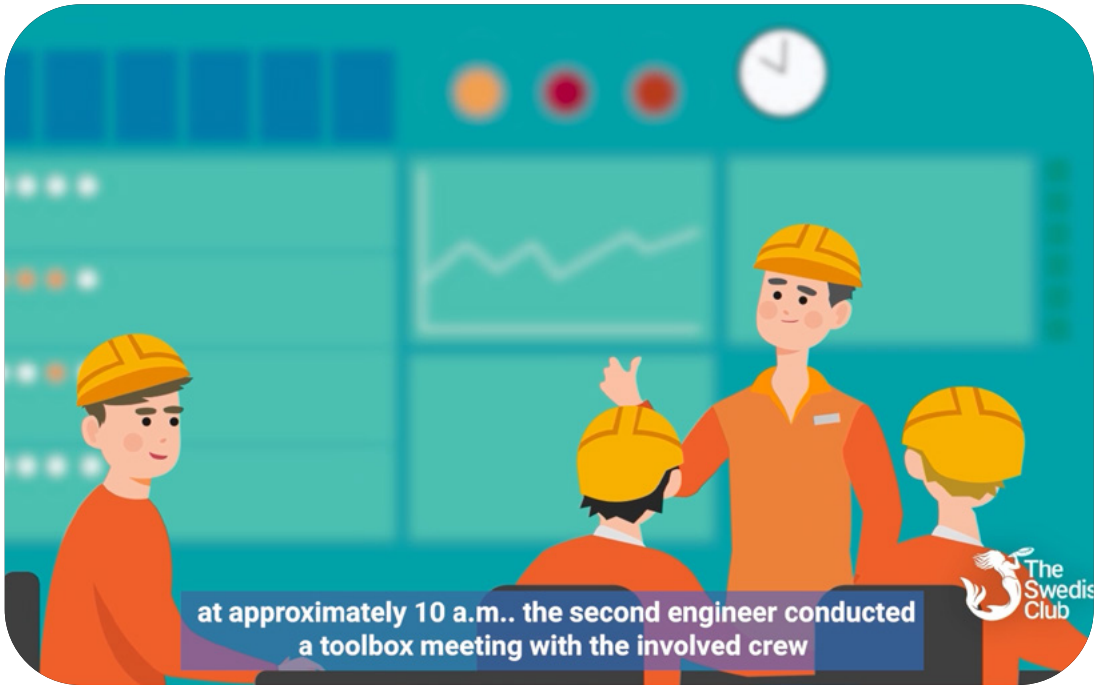
4 Case 4 – Injury - Two crew members burned by hot water

The incident arose during the repair of a valve in the engine room which was connected to a 12-inch steam pipeline that ran from the auxiliary boiler to the cargo tank heating coil system on deck. The repair was initiated after a large amount of condensation was discharged from the deck pipeline drains during weekly checks, leading the Chief Officer to suspect a faulty valve. The valve and heating system were not routinely used on the vessel's current trading pattern.





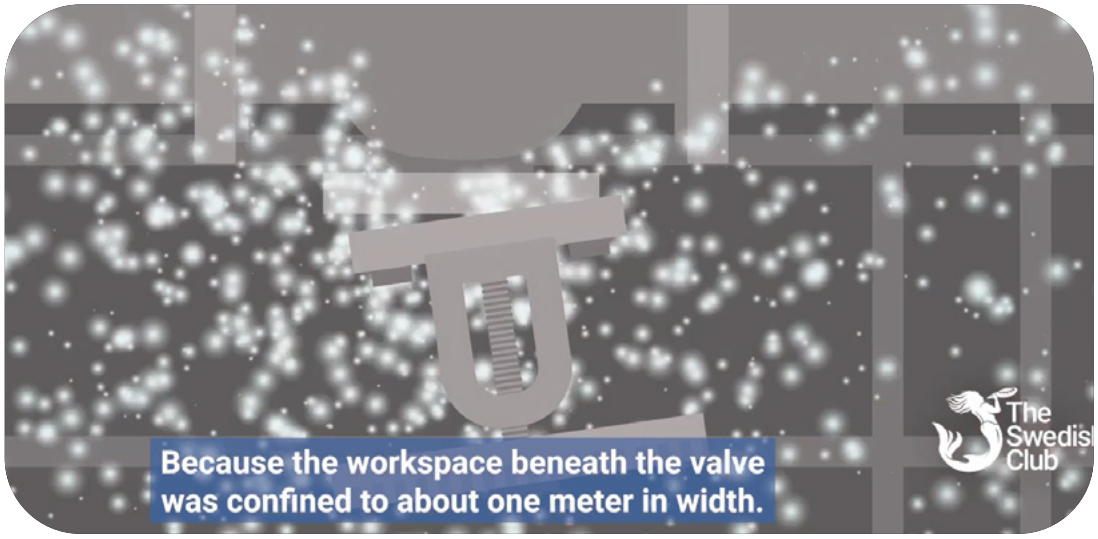
The Chief Engineer assigned the Second Engineer to carry out the repair. At approximately 10:00 AM, the Second Engineer conducted a toolbox meeting with the involved crew, detailing the steps to be taken: shutting down the auxiliary boiler, draining the pipeline of water, and blanking the line at a flange near the boiler before commencing any work on the valve. During this meeting, the Fitter and the Motorman expressed concerns that this was a non-routine task more suitable for dry-dock conditions, but their objections were overruled and the job proceeded as planned.



The boiler was shut down, the line drained, and the blank installed before the crew took a lunch break. After lunch, the Fitter and Motorman positioned themselves beneath the valve to remove the bonnet cover. Both were wearing boiler suits, safety helmets, leather gloves, ear protection and eye goggles.



They had removed two nuts and partially loosened two others when a sudden discharge of hot water—estimated between twenty and thirty litres—occurred. Because the workspace beneath the valve was confined to about one meter in width, the two men could not escape the surge of water. Both suffered burns to their legs, arms, back, buttocks, and portions of their faces. Although two other crew members in the vicinity received minor splashes and were treated with first aid onboard, the injuries to the Fitter and Motorman were more severe.



The Master arranged for the immediate evacuation of the injured men from the anchorage. They were transferred by launch from the vessel to shore and then taken to a specialized burn treatment facility at a local hospital.

Both crew members were reported to have sustained first and second degree burns over a large proportion of their bodies but were fortunately able to make a full physical recovery.



4.1 Questions

Do not only judge but also ask why you think these actions were taken and could this happen on your vessel?

1. Does our SMS address these risks?
2. What sections of our SMS would have been breached if any?
3. Do our procedures make sense for the work we actually do?
4. What in our system needs to be changed to avoid this from happening again?
5. How can we improve our toolbox meetings and communication so that crew members feel comfortable raising concerns, especially for non-routine jobs?
6. What additional steps can we take to ensure that equipment is fully cooled, isolated, and safe to work on before maintenance begins?
7. In what ways can we enhance our PPE standards to match the specific hazards of each task, such as working with hot fluids or steam under pressure?
8. What best practices should be followed when conducting this kind of job to minimize risk to personnel?
9. What mechanisms should we put in place so that any crew member can stop work if they suspect an unsafe condition, and how should this process be documented?
10. How can we ensure that all crew members, receive continuous training on hazard recognition, risk assessment, and proper emergency response?
11. What communication channels can we strengthen to make certain that safety concerns raised during toolbox meetings are properly evaluated and escalated if necessary?
12. How should we follow up after an incident to confirm that corrective actions (such as updated procedures, improved PPE, and training) have been implemented and are effective?
13. How can we encourage a proactive safety culture where lessons learned from past incidents—both onboard and from industry sources—are regularly reviewed, discussed, and incorporated into daily operations?
14. What additional training or practical drills could help the crew be better prepared?
15. What support do we need from management to strengthen our procedures?
16. What immediate, actionable steps can we take from today's discussion?

Notes

1. Does our SMS address these risks?

2. What sections of our SMS would have been breached if any?

3. Do our procedures make sense for the work we actually do?

4. What in our system needs to be changed to avoid this from happening again?

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14. What additional training or practical drills could help the crew be better prepared?

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16. What immediate, actionable steps can we take from today's discussion? recognition, risk assessment, and proper emergency response?

4.2 Port state findings

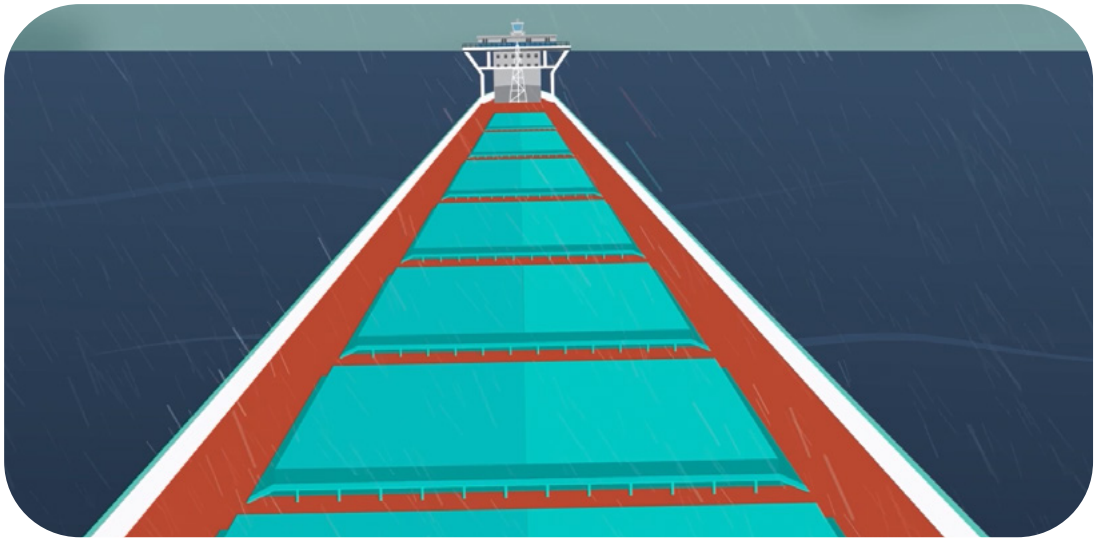
- During interviews with the Master, Chief Engineer, and involved crew, it emerged that there was no written procedure in the vessel's SMS for this kind of maintenance.
- Both the Master and Chief Engineer acknowledged the lack of formal guidelines and agreed that, going forward, more extensive personal protective equipment would be employed and additional cooling times instituted before undertaking similar work.
- They concluded their onboard investigation by recommending prompt valve repair, while requesting documentation on drug and alcohol testing.

4.3 What can we learn?

- Conduct comprehensive risk assessments for all non-routine or high-risk tasks.
- Develop and maintain written procedures within the vessel's SMS for infrequent maintenance activities.
- Require appropriate PPE tailored to the specific task, including full-face shields, heat-resistant clothing, and chemical-proof suits when working on hot fluids or steam systems.
- Ensure concerns raised by crew members during toolbox meetings are thoroughly evaluated and, if warranted, escalated to higher management levels before proceeding.
- Implement clear protocols for emergency response and medical evacuation.
- Conduct regular training and drills to prepare crew members for unexpected incidents and reinforce adherence to established safety procedures.
- Review and update the SMS and training programs based on lessons learned from incidents, ensuring continuous improvement in safety culture and risk management.

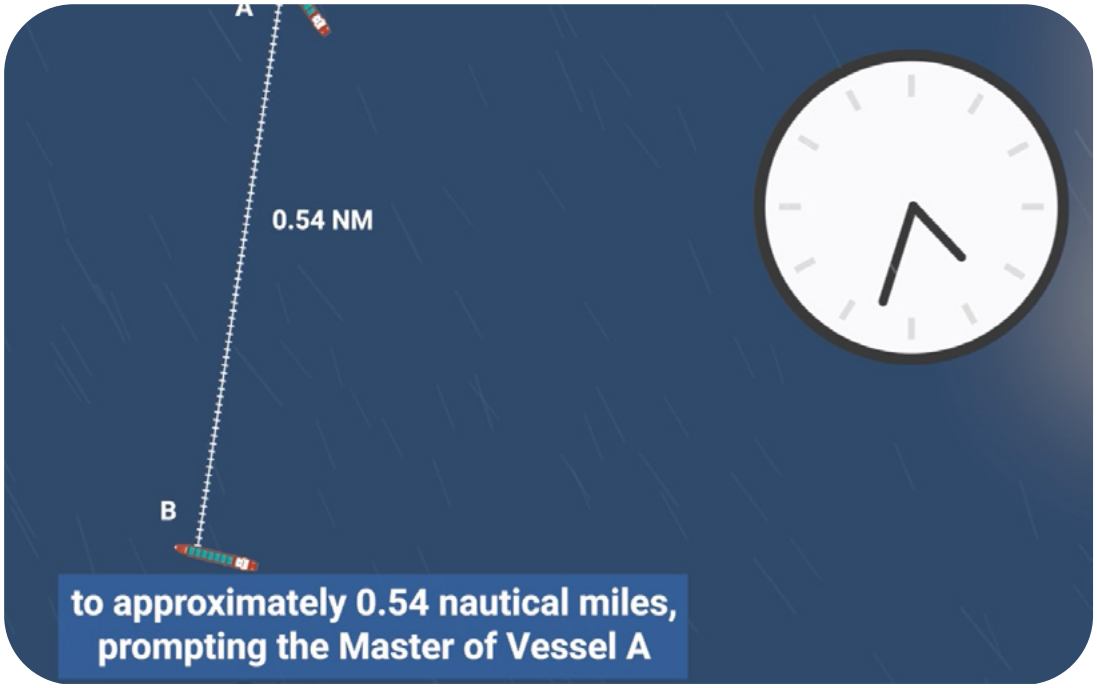
5 Case 5 – Dragging anchor led to collision

Two bulk carriers were at anchor awaiting berthing instructions. Vessel A had anchored using her port anchor with six shackles in the water and was positioned approximately 0.6 to 0.7 nautical miles north of Vessel B.

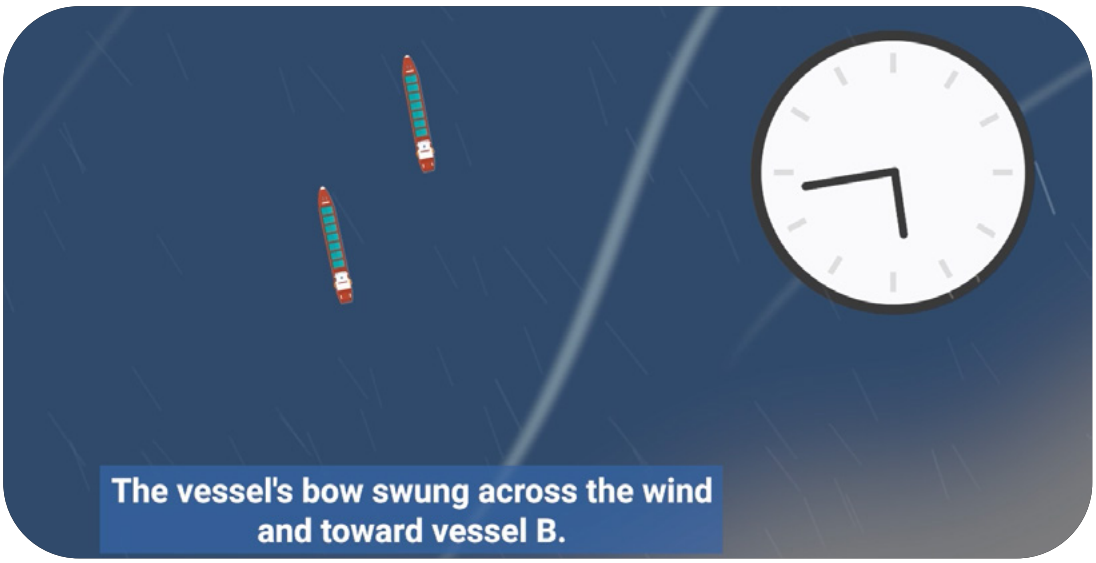


Initially, weather conditions on the day were moderate, with wind speeds between beaufort force 3 to force 5 overnight. However, conditions deteriorated significantly during the afternoon, with wind speeds intensifying to force 8 to force 9 from a northerly direction.

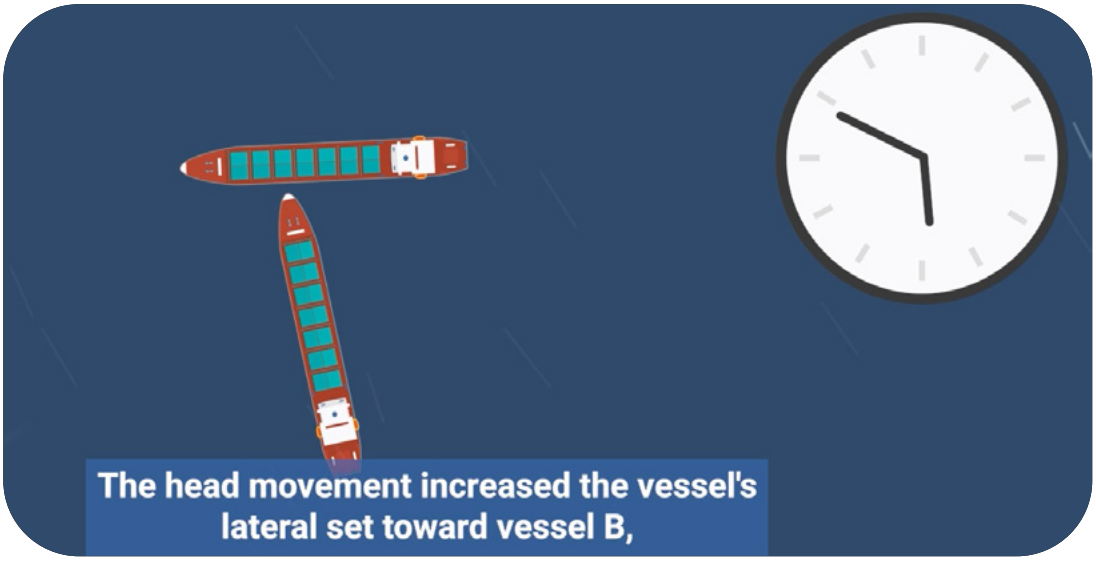
At around 16:30, the Officer of the Watch (OOW) onboard vessel A noted that vessel started to slowly drag anchor. This initial dragging reduced the distance between the two vessels to approximately 0.54 nautical miles, prompting the Master of vessel A to place the main engine on 5 minutes' notice. No additional precautionary measures were implemented.



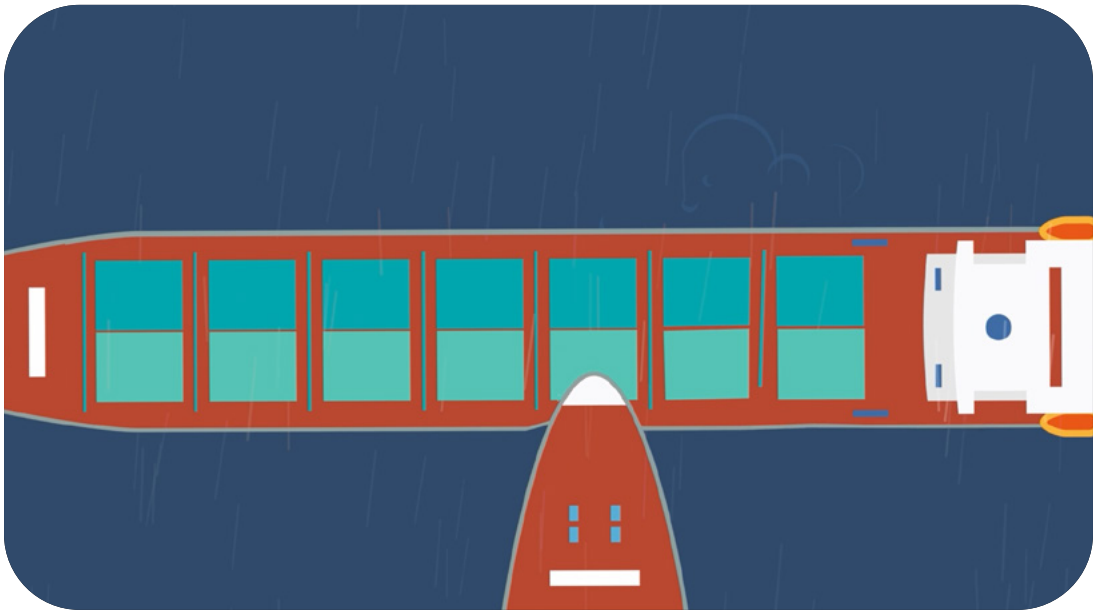
Approximately one hour later, at 17:34, vessel A started to drag, quickly accelerating to a dragging speed of 1.0 knots and subsequently 2.0 knots towards vessel B. The crew attempted emergency measures, including preparing the main engine and heaving the anchor. However, the engine took longer than expected to start, and when it became available, the Master ordered it to run ahead rather than astern.



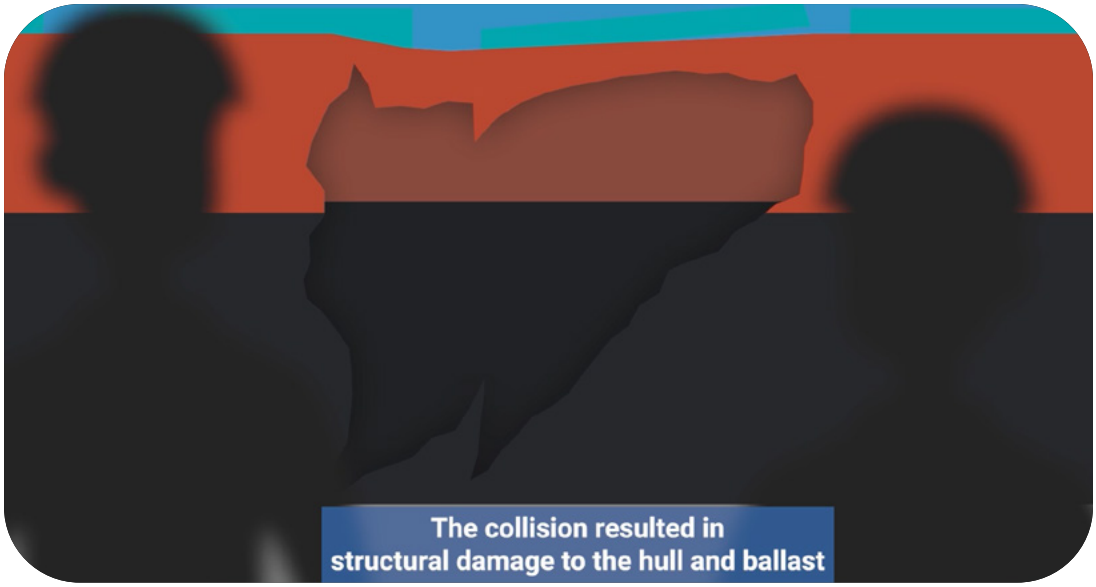
By driving the vessel ahead while the anchor cable was not fully secured, the vessel's bow swung across the wind and toward Vessel B. The northerly wind, combined with the tension on the cable, caused the vessel to sheer uncontrollably. Instead of relieving the drift, the ahead movement increased the vessel's lateral set toward Vessel B, ultimately resulting in a collision at approximately 17:53. The port side amidships area of Vessel A struck the bow of Vessel B.



Vessel B remained stationary and securely anchored throughout the event, having taken suitable precautions for the prevailing conditions. No proactive manoeuvres were made by vessel B, likely due to the limited time available to respond once the situation became apparent.



The collision resulted in structural damage to the hull and ballast tanks of Vessel A and to the bow and starboard anchor of Vessel B. There were no injuries or pollution reported.



Heave up the anchor and leave the anchorage if these environmental limits are exceeded.

Sheltered waters:

- Current velocity: max. 2.5m/s
- Wind velocity: max. 25m/s.
- No waves (sheltered waters)

Outside sheltered waters:

- Current velocity: max 1.5 m/sec
- Wind velocity: max 11 m/sec
- Significant wave height max 2 m

5.1 Questions

When discussing this case please consider that the actions taken at the time made sense for all involved. Do not only judge but also ask why you think these actions were taken and could this happen on your vessel?

1. Does our SMS address these risks?
2. What immediate actions should be taken if anchor dragging is suspected?
3. How can anchor watch practices be improved to prevent similar incidents?
4. Why is proactive weather monitoring critical when at anchor?
5. What are the procedures for preparing and testing the main engine readiness at anchor?
6. How can effective communication with nearby vessels improve safety at anchorages?
7. What specific signals or alerts should be made if a vessel begins dragging anchor?
8. Under what circumstances should a secondary anchor be deployed?
9. What role can tug assistance play in preventing collisions in anchorage areas?
10. How frequently should weather forecasts and anchorage conditions be reviewed?
11. Are our anchoring procedures sufficient to deal with problems like this?
12. What are the environmental parameters for leaving the anchorage?
13. Do we have Risk Assessment procedures onboard that address these risks?
14. What is the maximum depth that our anchoring equipment is designed to anchor at?
15. What specific techniques could help the bridge team maintain situational awareness?
16. What additional contingency plans or drills might strengthen a crew's ability to react to a situation like this?
17. Which everyday practices onboard can we reinforce to handle abnormal conditions more safely?
18. How can lessons from this event be transferred to other high-risk situations?
19. What immediate, actionable steps can we take from today's discussion?

Notes

1. Does our SMS address these risks?

2. What immediate actions should be taken if anchor dragging is suspected?

3. How can anchor watch practices be improved to prevent similar incidents?

4. Why is proactive weather monitoring critical when at anchor?

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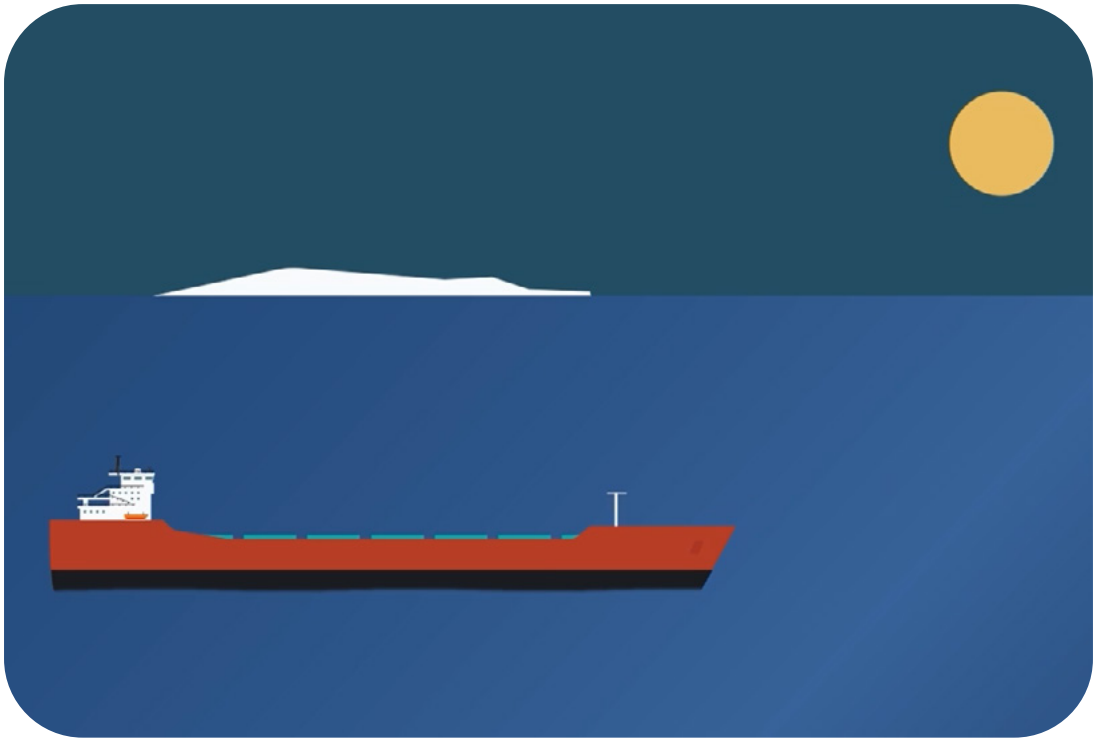
19. What immediate, actionable steps can we take from today's discussion?

5.2 What can we learn?

- At the first sign of anchor dragging, take decisive steps, pay out more cable, prepare the main engine for use, or deploy the second anchor if conditions allow.
- Keep the main engine on immediate notice during heavy weather or when forecasts indicate worsening conditions. Regularly test readiness to ensure declared notice times are realistic.
- Maintain continuous position monitoring via ECDIS, GPS, and radar. Treat any unexplained position shift or steady movement over the ground as potential dragging.
- Continuously assess forecasts and actual weather. Increase anchor cable or re-anchor before conditions exceed the vessel's safe limits.
- If heavy weather is anticipated outside of acceptable parameters leave the anchorage.
- Ensure clear roles and vigilance on the bridge. Regularly log position checks and cable lead observations.
- Maintain proactive communication with nearby vessels and port control. Early coordination can prevent close-quarters situations.
- Preserve VDR, ECDIS, and logbook data following any dragging or near-miss. Review actions taken and update standing orders to strengthen future response.

6 Case 6 – Severely burned in an onboard explosion

The Capesize bulk carrier had loaded steam coal in all its 7 cargo holds. The master had received the cargo declaration from the shipper where it mentioned that there was a risk of methane release, which is common for coal cargo. During



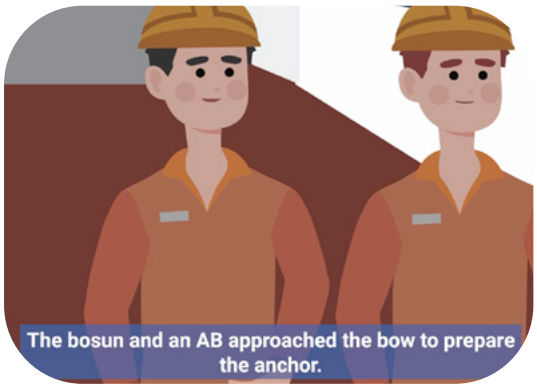
the voyage the vessel had sailed through heavy weather conditions which reached Beaufort scale 8.

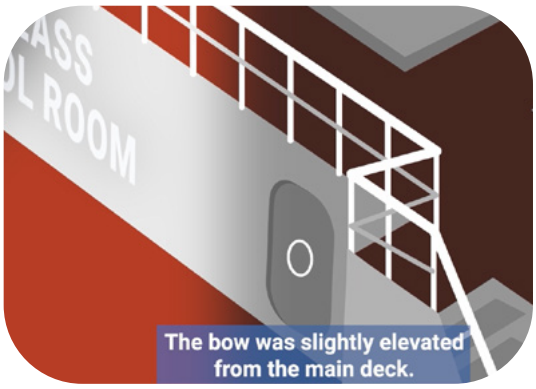


It was a clear winter evening, and the vessel was approaching port to anchor while waiting for a berth to be ready for discharging.

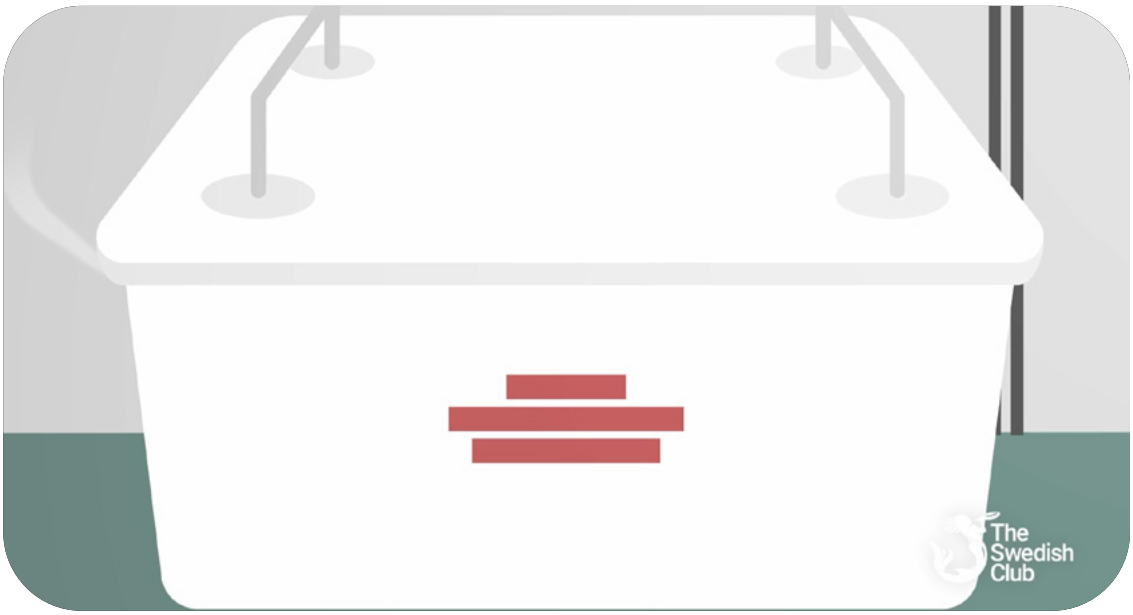
The bosun and an AB approached the bow to prepare the anchor. To start the anchor windlass, they had to enter the windlass control room on the bow. The bow was slightly elevated from the main deck. A ladder had to be used to get up to the bow. The door to the windlass control room was below the bow, facing the stern towards the cargo hatch coamings of cargo hold 1.

The hydraulic panel for the anchor windlass was inside the control room and other equipment panels. The access hatch to cargo hold 1 was also in the room.





The two crew members entered the room and approached the windlass panel. The bosun pushed the start button. At that moment there was a major explosion in the room.



On the bridge they heard a large bang from the bow but could not really see what had happened because it was dark outside.



The Chief Officer and another AB rushed to the bow to inspect what had happened.



The Chief Officer approached the bow and touched the bulkhead to the windlass room. He could not feel any heat. The Chief Officer shouted for the bosun but got no answer. He decided to open the door. He looked inside and there was almost no smoke in the room, but there were two bodies lying on deck, not moving. He could see that it was the bosun and the AB and he called on the radio for medical assistance and that two stretchers should be prepared.

The master called the VTS and asked for medical assistance. Within 10 minutes the 2nd officer arrived at the scene with first aid equipment, and soon afterwards crew members came with two stretchers. The bosun and the AB had severe burn injuries, and there was not much the 2nd officer could do but to give first aid and ensure that both men were breathing.



An hour later a coast guard cutter with paramedics arrived and the injured crew members were taken ashore. They were flown to a specialist hospital where they received help.

Both survived but had to go through painful surgery and it is unknown if they will ever be able to work at sea again.



6.1 Questions

When discussing this case please consider that the actions taken at the time made sense for all involved. Do not only judge but also ask why you think these actions were taken and could this happen on your vessel?

1. Do our procedures make sense for the work we actually do?
2. What in our system needs to be changed to avoid this from happening again?
3. How do we currently identify and classify enclosed or hazardous spaces on board?
4. Do we have additional spaces onboard that could be considered enclosed spaces?
5. Do we test the atmosphere and ventilate all enclosed spaces before entry?
6. Do we have a risk assessment for this kind of job?
7. If we do, could this risk assessment be improved?
8. Is a work permit required?
9. Do we get information from the charterer or shipper about the risks with the cargo?
10. Do we fully utilize the cargo declaration and any supplemental guidance from the shipper/charterer?
11. How is this information communicated to all relevant crew?
12. Is our cargo testing equipment as per the IMSBC code?
13. Are all the relevant crew trained for how to use the equipment?
14. How often do we calibrate and maintain this equipment?
15. How do we ensure spaces remain ventilated, especially in heavy weather conditions?
16. Are crew members encouraged to speak up if they suspect a safety issue, even if it delays an operation?
17. Do we have a system for reporting near-misses anonymously?
18. What additional training or practical drills could help to be better prepared for real-life scenarios like this?
19. Which everyday practices onboard can we reinforce to improve our procedures?
20. What support do we need from management (additional training, updated procedures, more resources) to strengthen our procedures?
21. What immediate, actionable steps can we take from today's discussion?

Notes

1. Do our procedures make sense for the work we actually do?

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20. What support do we need from management (additional training, updated procedures, more resources) to strengthen our procedures?

21. What immediate, actionable steps can we take from today's discussion?

6.2 What can we learn?

- It is probable that an accumulation of methane gas occurred within the windlass control room. The gas mixed with the air allowed the right concentration of gas to be ignited inside the hydraulic control panel by a switch or relay. The resulting ignition within the panel created an explosive flame and pressure wave that rapidly expanded into the control room. It seems likely that the methane gas entered the control room through the cargo hold access hatch.

- After the incident the windlass control room has been classified as an enclosed space which means that the crew has to test the atmosphere before entry to ensure it is gas free and has enough oxygen.

- The crew had planned to do gas testing of the cargo during the voyage. However, because of the heavy weather no testing was done the first week. Tests were done the last five days before arrival; no excessive amounts of methane gas were detected. An attending surveyor stated that the onboard gas testing equipment was not suitable for cargo testing but was designed for personal use when entering a cargo hold.

- There should be testing equipment onboard that meets the requirements of the IMSBC Code. It also critical that the crew is properly trained on how to use the equipment. The vessel should have at least two gas meters on board (in case one should fail) with certificates of calibration that will cover the period of the voyage. At a minimum the meters should measure methane (usually in % of Lower Explosive Limit or LEL), carbon monoxide and oxygen. The LEL is the lower limit, below which a mixture of methane and air will not explode. For normal air (21% oxygen) the LEL is 5% methane. Gas meters usually measure the percentage of LEL with 100% representing 5% methane in air. Coal emits methane to varying degrees.

- If the methane content in the hold exceeds the LEL, the gases in the hold constitute an explosive mixture. Even a small spark can cause an explosion. An additional danger from a methane explosion is that coal dust that has settled may be agitated into a dust cloud and the methane explosion can ignite the coal in the air. This could lead to a stronger explosion and potentially more damage to the vessel.

- Encourage a culture where crew members feel empowered to question procedures and practices which can have a negative effect on safety.

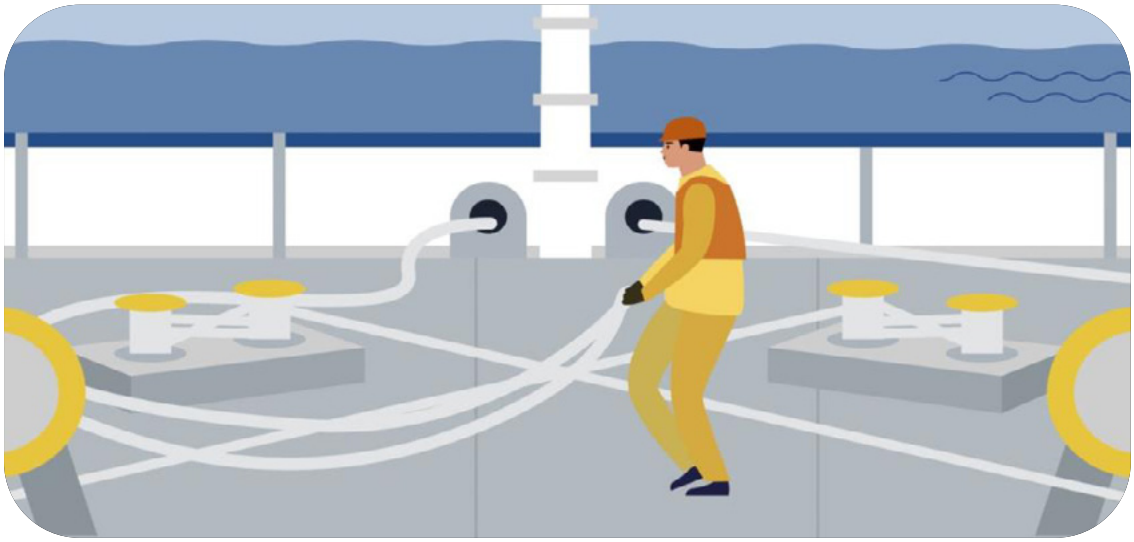
- Encourage crew members to come with suggestions on how to improve procedures and practices onboard.

- Promote adaptability and learning, encouraging crew to report near-misses and suggest improvements.

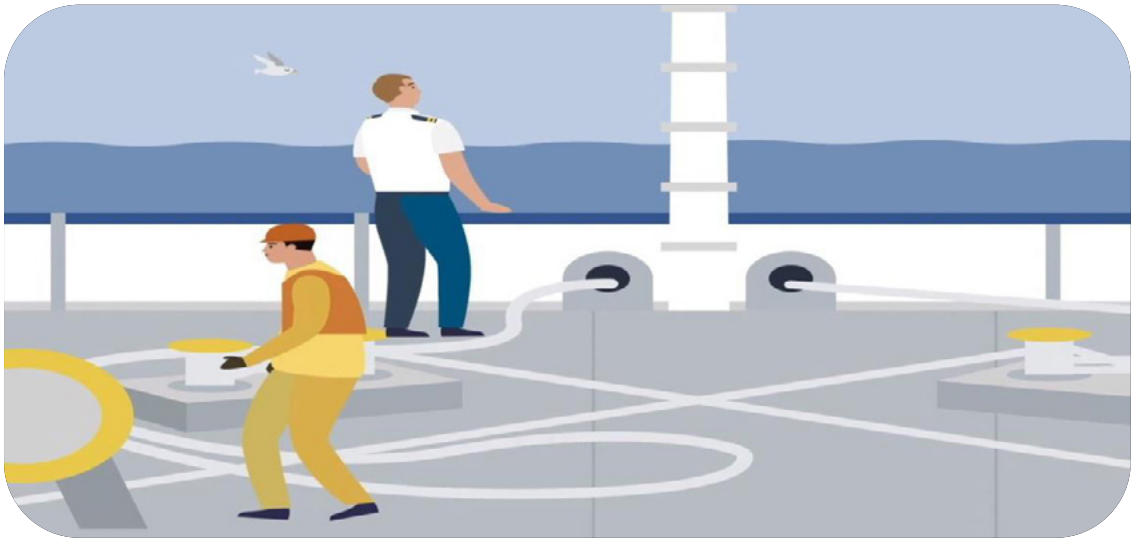
- Identify and support behaviours and practices that keep the crew safe under normal operations e.g., routine gas checks, thorough risk assessments. Ensure that these are the procedures on how the job should be done.

1. Case 1 – (produced in 2021) – He lost his leg during mooring operation

It was early morning, and the vessel was approaching the port. There was no wind or currents. On the stern, an AB was preparing the mooring ropes. The stern lines were put partly around a bollard with a bight at a right angle to the normal pull direction. After the AB had prepared the mooring lines, the Third Officer joined him. They talked for a while before the berthing operation began. First, the spring lines were sent ashore and made fast. The Master was on the bridge, and he put the engine pitch to zero, allowing the vessel a slight forward moment. The rudder was hard to starboard as the vessel was berthing port side alongside. After the spring lines were secured, the heaving line was connected to both stern lines.

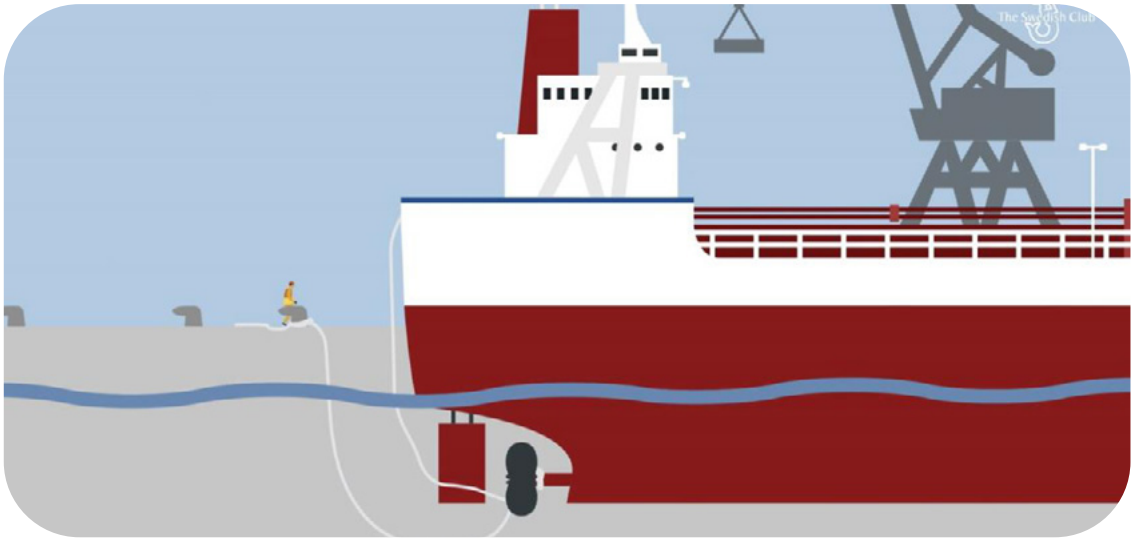


The Chief Officer, who had been by the manifold, came to the stern to assist and took charge of the mooring winch. The Third Officer walked to the stern railing by the fairlead. The linesmen shouted that they were ready to receive the stern lines, so the AB began to lower the stern lines into the water. He was facing the mooring winch and had his back to the Third Officer by the railing. He let the mooring lines run out at a very high speed.



Suddenly the Third Officer started to scream. The AB turned around and could see the Third Officer was caught between the mooring line and the fairlead. The mooring line's speed was now so fast that it cut through the officer's clothes, and he was bleeding badly. The mooring line was actually cutting through the Third Officer's leg which was cut off just below the knee.





The Chief Officer realised that the mooring rope was stuck in the propeller and screamed over the VHF to the Master to stop the engine. The Master pushed the emergency stop, and the propeller stopped.

The Third Officer was still standing but in severe shock, and he finally collapsed. The Chief Officer ran over to give first aid, and the gangway was rigged. A first aid team from shoreside came on board and helped. It took about 30 minutes for an ambulance to arrive and take the Third Officer to hospital. He survived but is now disabled and can never work at sea again.

1.1 Questions?

1. What were the immediate causes of this accident?
2. Is there a risk that this kind of accident could happen on our vessel?
3. How could this accident have been prevented?
4. How do we send mooring lines ashore?
5. Which side of the bollard should the mooring line have been?
6. How do we line up the mooring lines?
7. Have the crew been trained about the snapback area and other risks during the mooring operation?
8. Are the snapback zones clearly marked?
9. When we line up the mooring ropes is the snapback area considered?
10. Could the procedures be improved?
11. Do our mooring lines float?
12. Do we consider the risk of the stern lines getting caught in the propeller?
13. What sections of our SMS would have been breached if any?
14. Is our SMS sufficient to prevent this kind of accident?
15. If procedures were breached, why do you think this was the case?
16. Do we have a risk assessment on board that addresses these risks?
17. Could our risk assessment be improved?
18. How often do we inspect the condition of the mooring ropes?
19. Are these inspections logged in the PMS?
20. What do you think was the root cause of this accident?

Notes

1. What were the immediate causes of this accident?

2. Is there a risk that this kind of accident could happen on our vessel?

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13. What sections of our SMS would have been breached if any?

14. Is our SMS sufficient to prevent this kind of accident?

15. If procedures were breached, why do you think this was the case?

16. Do we have a risk assessment on board that addresses these risks?

17. Could our risk assessment be improved?

18. How often do we inspect the condition of the mooring ropes?

19. Are these inspections logged in the PMS?

20. What do you think was the root cause of this accident?

1.2 What can we learn?

- The vessel had a risk assessment for the mooring operation, but it did not include the risk of the mooring line getting stuck in the propeller, as the mooring line should be floating in normal circumstances. This time the mooring line was lowered too quickly and ended up under the surface. The propeller blades are only 2 metres below the surface, so the lines were sucked into the propeller.

- When passing lines to shore, they should be controlled and slowly passed to prevent the lines running below the water. This is also applicable for floating mooring lines.

- Another risk was that the mooring line was partly around the bollard, with a bight and a right angle to the normal pull direction. This arrangement caused the snapback zone to cover the entire area between the bollard and railing. When the rope ran out rapidly and became caught in the propeller, it snapped back to where the Third Officer was standing.

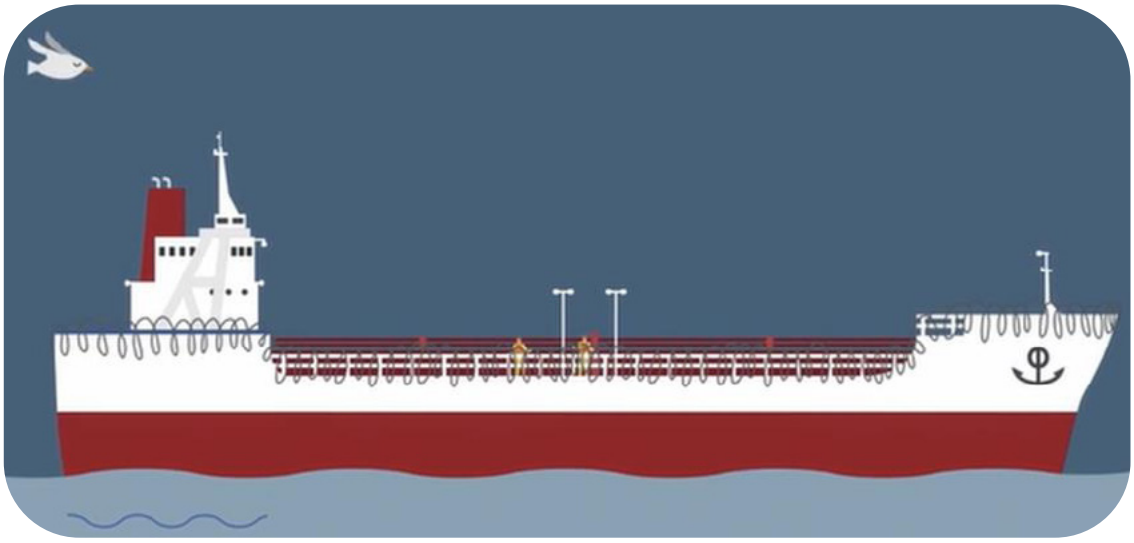
- The Third Officer was outside the normal snapback zone, showing the importance of evaluating each situation independently. The entire mooring deck could be considered a snapback zone. Mooring is a normal operation; however, it is a high-risk operation, and the risks need to be evaluated every time.

- It is important to always be aware of your surroundings and not stand too close to fairleads and ropes. Inexperienced crew members should be trained about these risks.

- When lines are prepared on deck, the line-up should be in direct line with the expected movement of the rope.

2 Case 2 – (produced in 2021) – Piracy attack while waiting for berth

The laden product tanker was drifting 20 miles outside a West African port where it would discharge its cargo. There had been pirate attacks in the area, so the Master had ordered preventive measures to be implemented as per the Ship Security Plan.



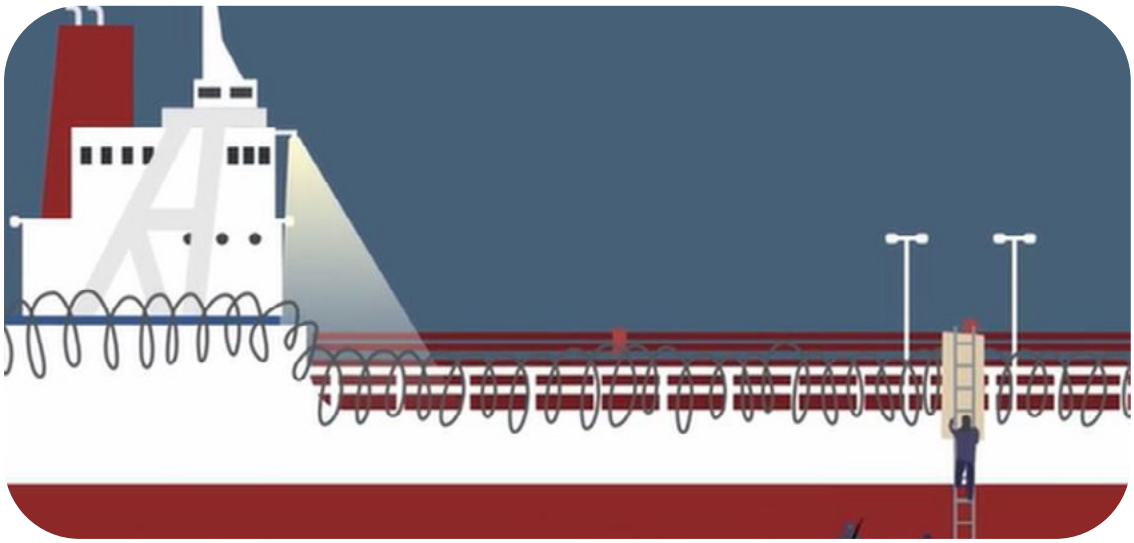
Two ABs were assigned to the poop deck and forecastle, but they were also to monitor the main deck. The crew prepared the deck and attached a single coil of barbed wire on the poop deck, forecastle and on the railing around the vessel; locked all doors and turned on all the outside lights. The Chief Officer noticed that a couple of lights were broken amidships and told the Bosun to repair them the next day.



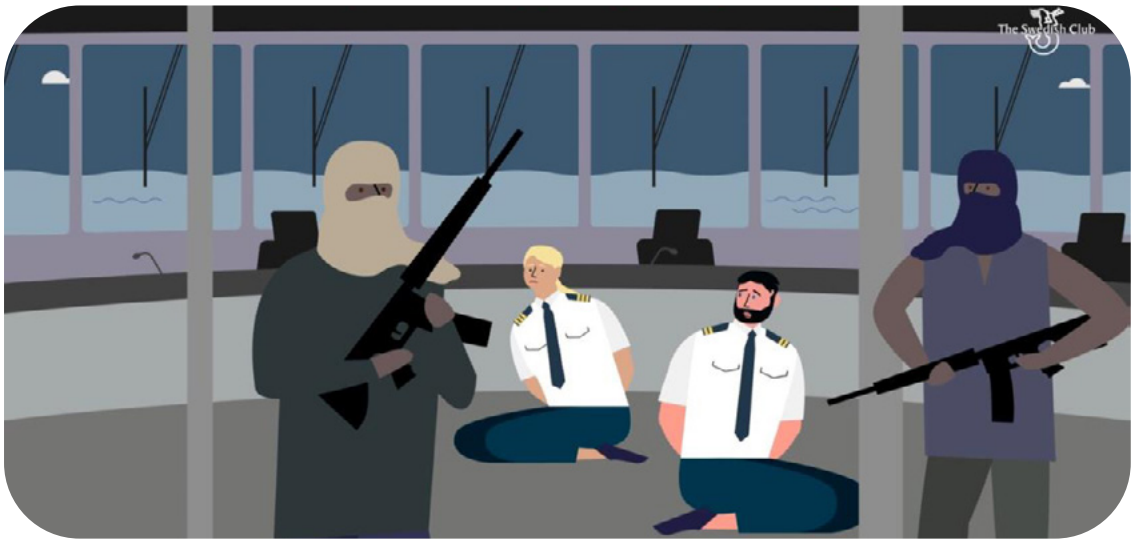
The agent had called the Master and informed him that the berth would be occupied for another two days and would be in contact when the berth was ready.

After midnight the Second Officer was on watch and was monitoring a dedicated VHF channel that the local navy was broadcasting on. The main engine was kept running so the vessel could manoeuvre instantly, and two ABs carried out regular patrols on deck.

Shortly after midnight, a small boat slowly approached the vessel. It stopped amidships by the broken lights where the freeboard was only 2 metres. A ladder was put on the railing, which had a carpet attached to protect from the barbed wire, and five men climbed on board.



None of the ABs saw the small boat approaching. The boat did not give a stable echo reading on the radar as it was made of wood and the choppy sea interfered.
The men who climbed on board were pirates and armed with machine guns. They made their way to the poop deck and surprised the AB on watch. The pirates demanded that the AB should take them to the bridge, or they would kill him. The AB unlocked the door into the accommodation and led the pirates to the bridge. When the pirates had secured the bridge, they asked for the Chief Engineer to be brought to the bridge. He was beaten when he arrived and told that he would be killed if he tried to sabotage the engine and that any engineer would be killed if they tampered with the engines.

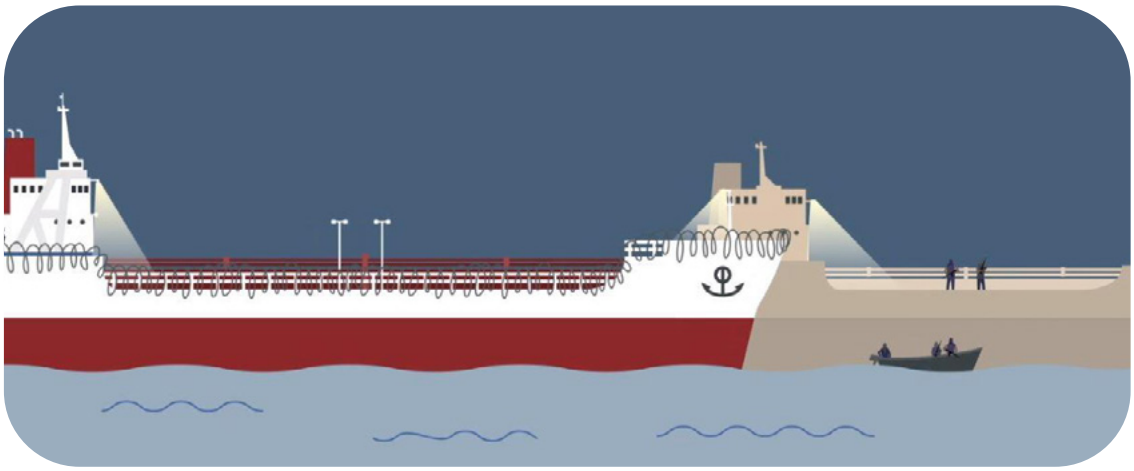


The Second Officer was told to show two of the pirates to the Master's cabin, and the other three remained on the bridge with an AB and the Chief Engineer. The Master was forcefully woken up, beaten and forced to open the safe and give all the money to the pirates. When the Master was taken to the bridge, ten more pirates had arrived. A larger vessel was drifting alongside, which looked like a fishing boat.

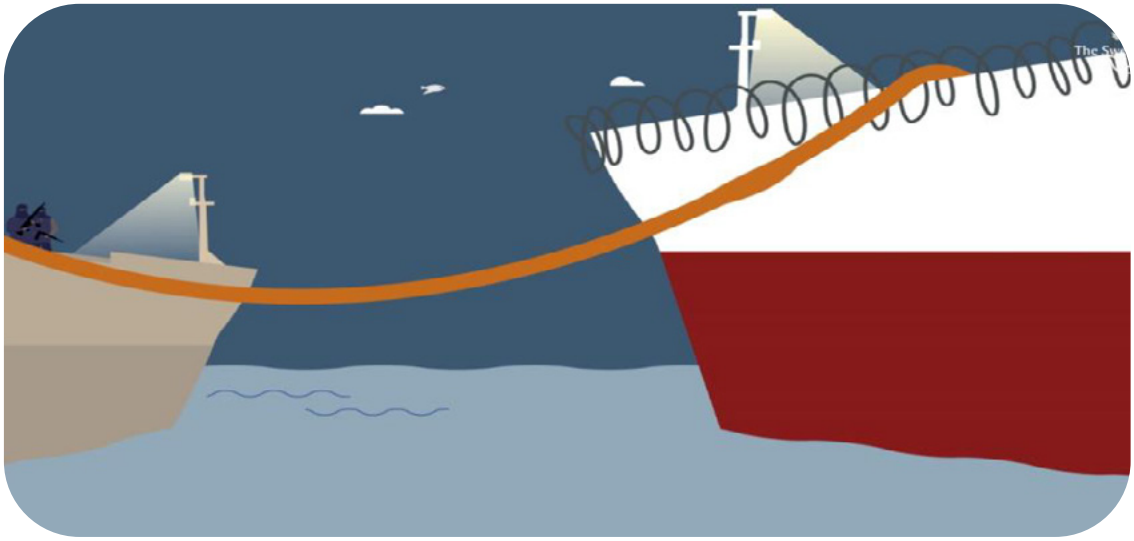
One of the pirates identified himself as the leader and explained to the Master that all the crew should be summoned to the mess room. If anyone resisted or tried to sabotage anything on the vessel, he would be killed.

All the crew, except the Master, were placed in the mess room and their hands were tied. The Master remained on the bridge. One of the Ship Security Alert System (SSAS) buttons was under a radar console, but the Master was not close to it and was too scared to push it.

The pirates took control of the vessel and sailed it for ten hours when they stopped beside another smaller tanker.



They started a ship-to-ship operation, and when the other tanker had been loaded, it sailed off.



The other two pirate boats had followed and were drifting alongside the vessel. The pirates took the Master to the mess room and tied him to a chair. He finally freed himself, and when he reached the bridge, he realised that the pirates had left, because both pirate boats were gone. He called the office and informed them of what had happened.

2.1 Questions

1. What are the immediate causes of this situation?
2. Is there a risk that this could happen to our vessel?
3. Could this incident have been prevented?
4. Would our ISPS measures have prevented the pirates from boarding the vessel?
5. Could we improve our SSP against pirates?
6. Is our SSP in accordance with the latest BMP and other piracy guidelines?
7. Is there any specific equipment or procedures that would be an improvement?
8. Do we have a sufficient number of floodlights?
9. Are the floodlights checked before entering a high-risk area?
10. As per our SSP should we have physical barriers which increase the height which will make it more difficult for the pirates to attach the ladders?
11. Do we have a citadel onboard?
12. If not, would we have this if we operated in a high-risk area?
13. Which sections in our SMS or SSP would have been breached if any?
14. Are our SMS and SSP enough to prevent this situation?
15. If procedures were breached, why do you think this was the case?
16. Do we have a risk assessment on board that addresses these risks?
17. What do you think is the root cause of this situation?

Notes

1. What are the immediate causes of this situation?

2. Is there a risk that this could happen to our vessel?

3. Could this incident have been prevented?

4. Would our ISPS measures have prevented the pirates from boarding the vessel?

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11. Do we have a citadel onboard?

12. If not, would we have this if we operated in a high-risk area?

13. Which sections in our SMS or SSP would have been breached if any?

14. Are our SMS and SSP enough to prevent this situation?

15. If procedures were breached, why do you think this was the case?

16. Do we have a risk assessment on board that addresses these risks?

17. What do you think is the root cause of this situation?

2.2 What can we learn?

- Best management practices should be followed and need to be adapted to every different area the vessel is visiting. It is essential that a piracy risk assessment for the trading area has been completed as described in 'Best Management Practices to Deter Piracy 5 (BMP5)' and 'Guidelines for Owners, Operators and Masters for Protection Against Piracy in the Gulf of Guinea'.

- It is not common for pirates in the Gulf of Guinea (GoG) to use ladders, but in this attack, ladders were used to board the vessel, so preventive measures should be analysed and implemented. Physical barriers which increase the height will make it more difficult for the pirates to attach the ladders. A proper risk assessment needs to be completed.

- It is imperative that all required equipment is in working condition. In this case, a number of floodlights were broken.

Ships operating in the GoG area are strongly urged to plan according to the following:

- Arrive at the pilot station, port, anchorage or STS area 'just in time'. Plan transit times with consideration to safe speed and maintaining distance offshore or use an offshore waiting area.

- Rendezvous - where possible, avoid waiting and slow steaming. Consider offering several alternative rendezvous points and advise rendezvous points at the last minute. If waiting, keep well off the coast (up to 200 NM). Do not give away waiting positions. Do not drift and keep engines ready for immediate manoeuvres.

- Vessels should proceed within the 200 NM range at full speed.

- Anchoring - where practicable, a prolonged stay at anchorage is to be avoided.

- Minimise use of VHF and use e-mail or secure satellite telephone instead. Where possible, answer only known or legitimate callers on the VHF, bearing in mind that imposters are likely and may even appear in uniform.

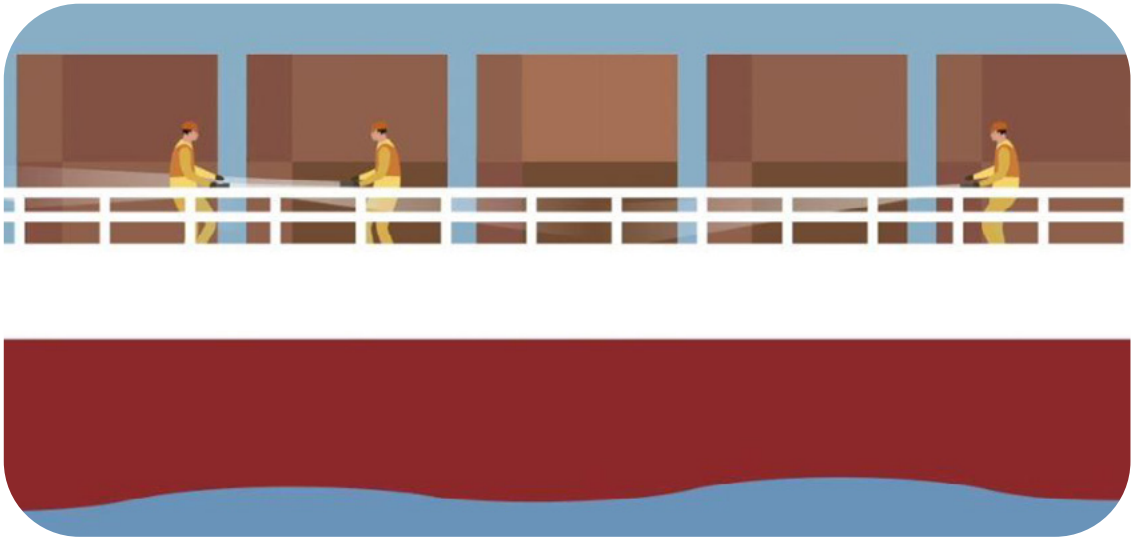
- The greatest risks of piracy are at night, and these need to be factored into all planning. Where possible, operations should start and end during daylight hours.

- The use of privately contracted armed guards on board is banned in Nigerian waters.

- If using an armed escort, due diligence on the company providing this service must be conducted to ensure strict adherence to the MOU issued by the Nigerian Navy and Nigerian Maritime Administration & Safety Agency (NIMASA).
- Shipowners and managers must have a means of verification that hardening measures are available and in place on vessels prior to entering the GoG area.
- Spot checks for verification at ports within the GoG area are an additional option to consider.
- Nigerian naval armed guards can protect merchant ships utilising patrol boats to escort ships in the region.
- Maintain all-round visual look-outs & good radar watch.
- Report to MDAT-GoG (the Maritime Domain Awareness for Trade – Gulf of Guinea, operated jointly by French and UK Navies); watchkeepers@mdat-gog.org, emergency tel: +33(0) 298 22 88 88.
- The MDAT-GoG will liaise directly with the navies in the region in the event of an attack. If a ship does not report to the centre, then there is likely to be a delay in the response from the regional navy. Alerts and warnings will be issued by MDAT-GoG, and they will also contact vessels in the immediate vicinity of an incident.

3 Case 3 – (produced in 2021) – Stowaways in the steering gear trunk

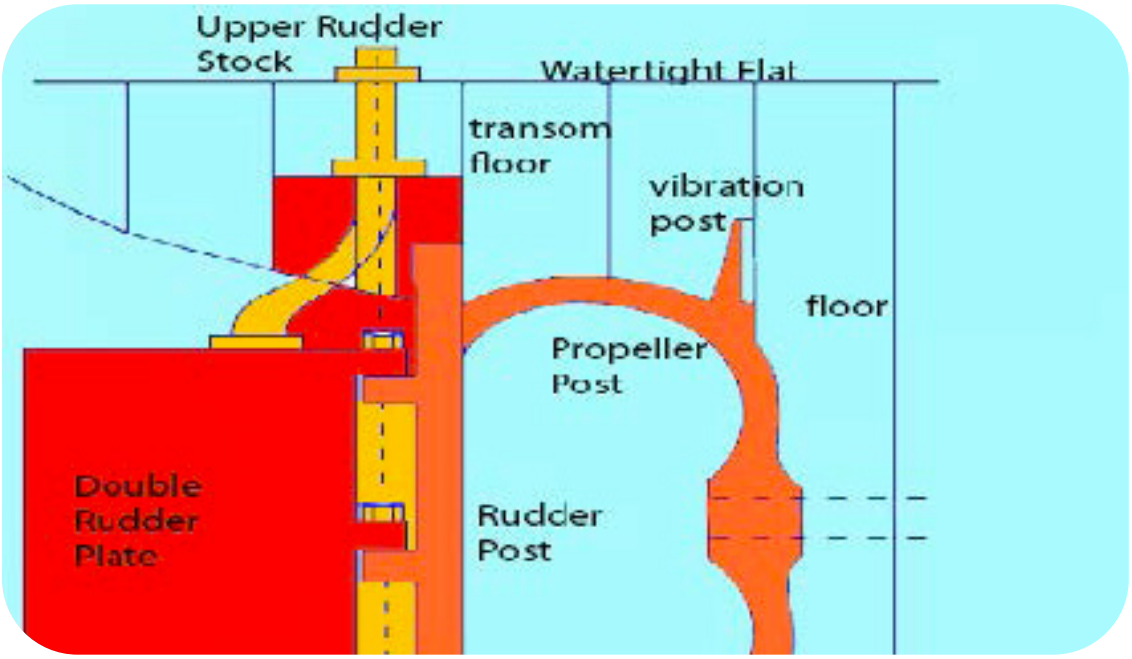
A container vessel had departed from Lagos, and the next port of call was in Malaysia. Before departure, the crew performed a stowaway search as per the Ship Security Plan. No stowaways were found.



The vessel departed, and after disembarkation, another search was carried out. Still, no stowaways were found.

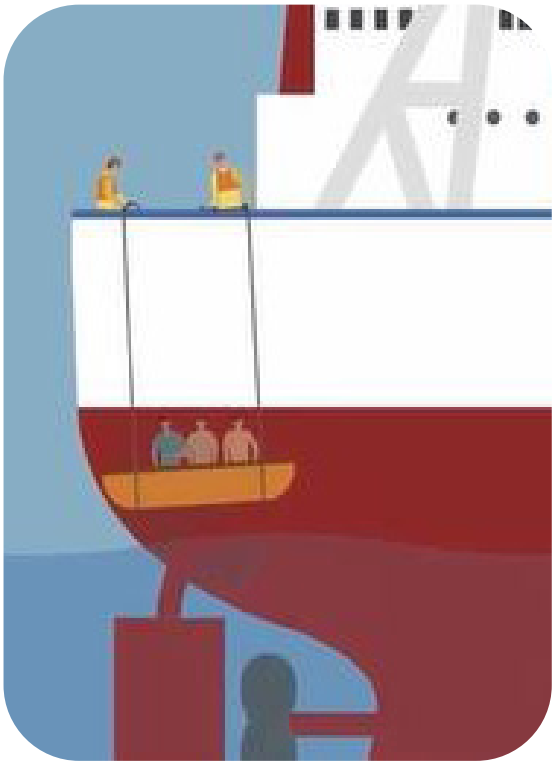
The following day the Bosun heard knocking sounds coming from the hull in the steering gear room. He informed the Master straight away. The crew began to investigate the sounds and could hear knocking coming from what they believed was the rudder trunk.

There was no access to the rudder trunk as it is space taken up by the rudder stock. The rudder trunk is only accessible from the outside of the vessel. This was a so-called unbalanced rudder, which means that the rudder stock is attached aft of the rudder hinges. The hinges are at the forward end of the rudder.



The vessel was in open sea, and the Master brought the vessel to a stop. The crew lowered a camera on the stern to see if they could see anything by the rudder. When they recovered the camera and watched what they had filmed they could see three people sitting on the rudder.





The crew lowered the rescue boat and picked up the three men. The stowaways had used a small rowing boat to reach the vessel and had then managed to climb up the rudder and then into the rudder trunk. So that the stowaways could disembark, the vessel had to divert to Cape Town.

There is never access to the rudder trunk from the inside of the vessel as it is just an open void considered part of the hull.

3.1 Questions

1. What were the immediate causes?
2. Is there a risk of this happening on our vessel?
3. What could you have done to prevent this?
4. Do we search the outside of the vessel when we are in a port with a high risk of stowaways?
5. Do we lower the rescue boat to inspect the rudder and steering gear trunk before departure?
6. If we have a void space for the steering gear trunk, do we have steel bars to prevent access?
7. In high-risk ports, do we use security guards?
8. What is the most likely access point for a stowaway?
9. What sections of our SMS and SSP would have been breached, if any?
10. Do our SMS and SSP address these risks?
11. How could we improve our SMS and SSP to address these issues?
12. What do you think was the cause of this incident?
13. Is there any kind of training that we could take to address these issues?

Notes

1. What were the immediate causes?

2. Is there a risk of this happening on our vessel?

3. What could you have done to prevent this?

4. Do we search the outside of the vessel when we are in a port with a high risk of stowaways?

5. Do we lower the rescue boat to inspect the rudder and steering gear trunk before departure?

6. If we have a void space for the steering gear trunk, do we have steel bars to prevent access?

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11. How could we improve our SMS and SSP to address these issues?

12. What do you think was the cause of this incident?

13. Is there any kind of training that we could take to address these issues?

3.2 What can we learn?

- It is extremely unlikely that a person would be able to sit on the rudder and not be washed out of the rudder trunk during a sea passage. If people in the rudder trunk are not found before departure or shortly after departure, they will most likely be lost at sea.

- To prevent stowaways from achieving access, please consider the following if the vessel is in a port with a high risk of stowaways;
  - ✓ If the rudder is above the waterline, using the rescue boat, inspect the rudder and if possible, the rudder trunk before departure.
  - ✓ Install protective grating or steel bars onto the steering gear trunk to prevent access from the rudder.

Avoid embarkation of a stowaway:

- Members of the crew, or reliable external guards, should be posted at the gangway and on RoRo vessels at each open ramp. Access points to the vessel should generally be kept to a minimum.

- Stevedores and other people who are authorised visitors on the vessel should carry identification cards or tags which they should wear to be easily visible. Records should be kept of people boarding and disembarking the vessel.

- Mooring lines, the outboard side of the vessel, and containers, whether sealed or empty, are common access points. To eliminate such possibilities, security must be tightened in the cargo handling routines, and the deck area should be patrolled regularly. Make sure that proper deck lighting is maintained during the night.

- The crew should be encouraged to report anything that looks suspicious.

- All doors and entrances to the accommodation, stores and similar should be kept locked in port.

- A search of the vessel, including the cargo holds, should be made before departure. Stowaways are often unaware of the hazards on board a vessel. They may hide in places which would seem highly unsuitable such as reefer holds, rudder trunks, ventilation fan shafts, funnels, and cargo tanks. Such areas should not be overlooked when the vessel is searched.

If a stowaway is detected on board:

- Search the vessel for more stowaways. If one has been able to sneak on board undetected, others may have been able to do the same.

- Search the stowaway and the surroundings where the stowaway was found for documents or other belongings which could confirm or give a clue as to his/her identity. Documents found should be kept by the Master in a safe place.

- The stowaway should be questioned in order to verify his/her identity in preparation for repatriation. A suggested questionnaire can be found using the link below. These details, including particulars of any documents found that confirm the stowaway's identity should be forwarded immediately to the owner's head office and the ship agent in the next ports of call.

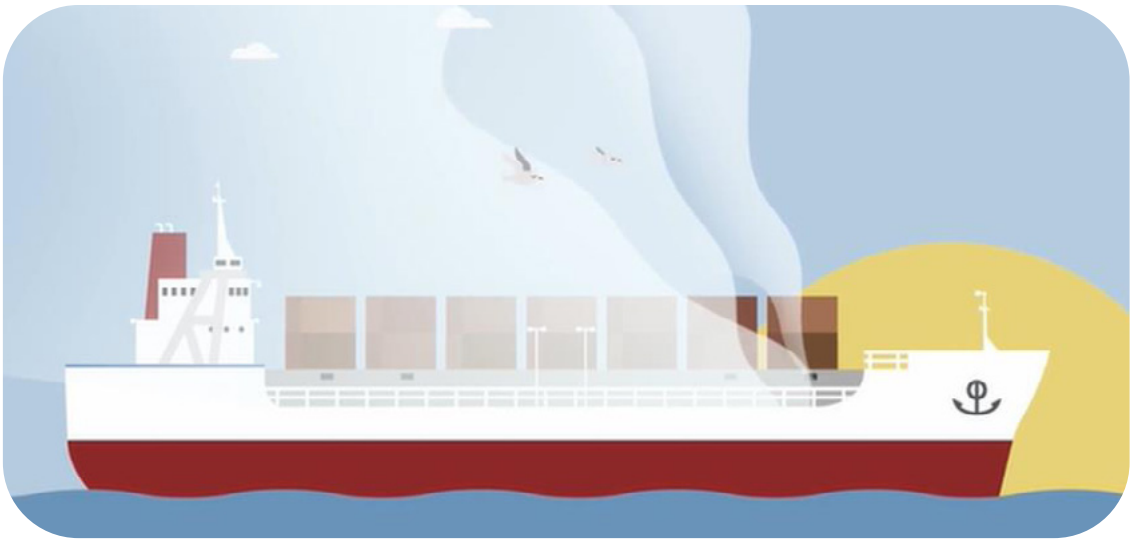
- While the stowaway remains on board, the immigration authorities in all ports of call should be informed of his/her presence and their status as a stowaway. Failure to inform the authorities properly can result in fines against the vessel.

- The Club advises strongly against signing on the stowaway as a crew member. The vessel may have fines imposed if the authorities discover the true status of the stowaway. By temporarily upgrading a stowaway to a crew member, the shipowner may also assume much wider liabilities in case of injury, illness, or death.

- The stowaway must be treated humanely. Adequate living conditions, such as meals, accommodation, medical attention, and sanitary facilities, should be provided until the stowaway can be disembarked.

4 Case 4 – (produced in 2021) – Misdeclared container caused fire

It was early morning, and from the bridge, the Master saw a large cloud of smoke issuing from the forward part of the vessel. At the same time, the fire detection system for cargo hold 3 sounded on the bridge. The Master described the smoke as being white at first and then greyish. The Chief Officer, however, described the smoke as being “dark grey, almost black”.



The ventilation fans for the cargo holds were stopped. The fans for cargo hold 3 were not operating at that time, but natural ventilation was being provided for the holds as the covers for the vents were open. Crew members closed the covers of the vents for cargo hold 3, and no crew member entered the cargo hold.

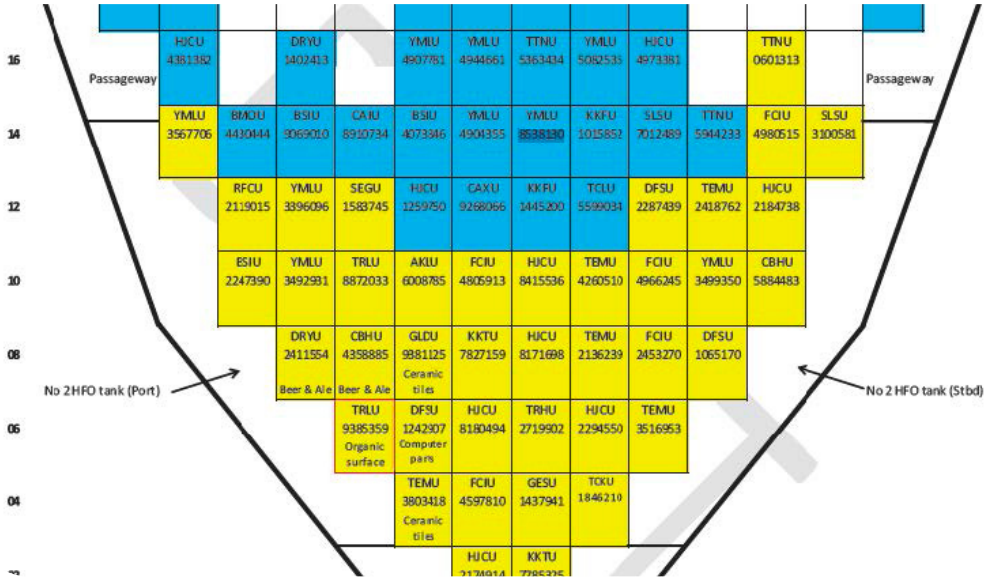
Meanwhile the Master navigated the ship to a nearby anchorage. After various checks had been performed, the Chief Engineer released the contents of almost 200 CO2 cylinders into cargo hold 3. This discharge was the designated full complement of CO2 required for the hold and appeared to extinguish the fire. A couple of hours later smoke began to issue from the hold, and a further 50 CO2 cylinders were released into cargo hold 3. About six hours later, smoke was observed issuing from cargo hold 3, and the Chief Engineer released a further 50 CO2 cylinders.



Salvors boarded the vessel the following morning. Shortly before midnight, temperature checks were completed by the vessel's crew indicating that the temperature in cargo hold 3 was rising, so five more CO2 cylinders were released. In the morning another 20 CO2 cylinders were released. The salvors entered cargo hold 2 and measured the temperature of the bulkhead to cargo hold 3 - it was 80°C. It was decided that cargo hold 3 should be filled with water from the fire hydrants. The water filled three container tiers up, and after a couple of hours, the salvors considered the fire to be extinguished.



The container where the fire started was not declared as dangerous cargo but was actually loaded with calcium hypochlorite and had been misdeclared by the shipper. The charterer had loaded the container as per the rules of the IMDG code. As per the manifest, the container was allowed to be loaded in the cargo hold, but as the cargo was calcium hypochlorite, it should not have been loaded below deck or in the position it was stowed in.


16
14
12
10
08
06
04
Passageway
Passageway
No 2 HFO tank (Port)
No 2 HFO tank (Stbd)
HJCU 4181382
DRYU 1402413
YMLU 4907781
YMLU 4944661
TTNU 5363414
YMLU 5082535
HJCU 4973381
TTNU 0601313
YMLU 3567706
BMOU 4410444
BSIU 3069010
CAIU 8910734
BSIU 4073346
YMLU 4904355
YMLU 8538130
KKFU 1015852
SLSU 7012489
TTNU 5944233
FCIU 4980515
SLSU 3100581
RFCU 2119015
YMLU 3396096
SEGU 1583745
HJCU 1259750
CAXU 9268066
KKFU 1445200
TCLU 5599031
DFSU 2287439
TEMU 2418762
HJCU 2184738
BSIU 2247390
YMLU 3492981
TRLU 8872033
AKLU 6008785
FCIU 4805913
HJCU 8415536
TEMU 4260510
FCIU 4966245
YMLU 3499350
CBHU 5884483
DRYU 2411554
Beer & Ale
CBHU 4358885
Beer & Ale
GLDU 9881125
Ceramic tiles
KKTU 7827159
HJCU 8171698
TEMU 2136239
FCIU 2453270
DFSU 1065170
TRLU 9385359
Organic surface
DFSU 1242907
Computer pars
HJCU 8180494
TRHU 2719902
HJCU 2294550
TEMU 3516953
TEMU 3803418
Ceramic tiles
FCIU 4597810
GESU 1437941
TCKU 1846210
HJCU
KKTU



4.1 Questions

1. What were the immediate causes of this accident?
2. Is there a risk that this kind of accident could happen on our vessel?
3. How could this accident have been prevented?
4. What sections of our SMS would have been breached if any?
5. Is our SMS sufficient to prevent this kind of accident?
6. Does our SMS address these risks?
7. If procedures were breached, why do you think this was the case?
8. Do our procedures make sense to the work we actually do?
9. Are our firefighting drills effective enough to address the problems in this case?
10. Do we have sufficient firefighting equipment to deal with a situation like this?
11. What do you think was the root cause of this accident?
12. What preventive measures do we take?
13. Are the work permit and risk assessment easy to fill out?
14. Do the work permit and risk assessment make sense for the work we are doing?
15. How can we improve our work permit and risk assessment?
16. Any opinion on how to improve the situation of misdeclared cargo?

Notes

1. What were the immediate causes of this accident?

2. Is there a risk that this kind of accident could happen on our vessel?

3. How could this accident have been prevented?

4. What sections of our SMS would have been breached if any?

5. Is our SMS sufficient to prevent this kind of accident?

6. Does our SMS address these risks?

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14. Do the work permit and risk assessment make sense for the work we are doing?

15. How can we improve our work permit and risk assessment?

16. Any opinion on how to improve the situation of misdeclared cargo?

4.2 What can we learn?

- Calcium hypochlorite and other oxidising solids are often used for swimming pool sterilisation and fabric treatment (bleaching or washing). These materials do not oxidise, but they can be relatively unstable chemicals that decompose slowly over time, evolving oxygen. This self-decomposition can evolve heat. A self-heating process can therefore happen in which the material towards the middle of a body of cargo becomes hotter, so the rate of decomposition and heating increases. This can lead to 'thermal runaway' with very rapid self-decomposition and evolution of heat and gases, sometimes including further oxygen. The effects of this in a hold can be similar to an explosion. The heat and oxygen produced can lead to fire spreading.

Potential causes of self-decomposition incidents include:

- ✓ Exposure to heat, e.g. solar radiation (before or after loading), cargo lights and heated fuel tanks.
- ✓ Cargo formulation.
- ✓ Contamination of cargo at manufacture.
- ✓ Spillage and thus reaction between cargo and combustibles, e.g. timber.
- ✓ Excess quantity of cargo in containers giving insufficient dissipation of heat.
- ✓ Inadequate separation of packages in containers, also giving insufficient dissipation of heat.

- Calcium hypochlorite is not considered a stable substance as it decomposes under normal circumstances and slowly releases heat and oxygen. If the heat that is released can be dissipated, it is not significant and will not create any problems; however, it is recognised that when stowed in too great a bulk, the heat generated by the slow decomposition cannot escape fast enough. When such a scenario occurs, the internal temperature of the cargo rises, the rate of decomposition increases, and this can lead to a runaway reaction that ultimately results in a fire and/or an explosion. A similar problem can happen if the surrounding temperature is too high. Impurities within calcium hypochlorite can also increase the rate of decomposition. Such impurities can be introduced during the manufacturing process, or due to the nature of the packaging materials, or by the failure of packaging, allowing the escape of cargo.

- Calcium hypochlorite is an IMDG Class 5.1 oxidising agent as described in the IMDG Code. The Code stipulates the following requirements in relation to the stowage and segregation of the common types of high strength calcium hypochlorite:
  - ‘Category D [on deck only]. Cargo transport units shall be shaded from direct sunlight and stowed away from sources of heat. Packages in cargo transport units shall be stowed so as to allow for adequate air circulation throughout the cargo. Separated from ammonium compounds, acids, cyanides, hydrogen peroxides and liquid organic substances.’

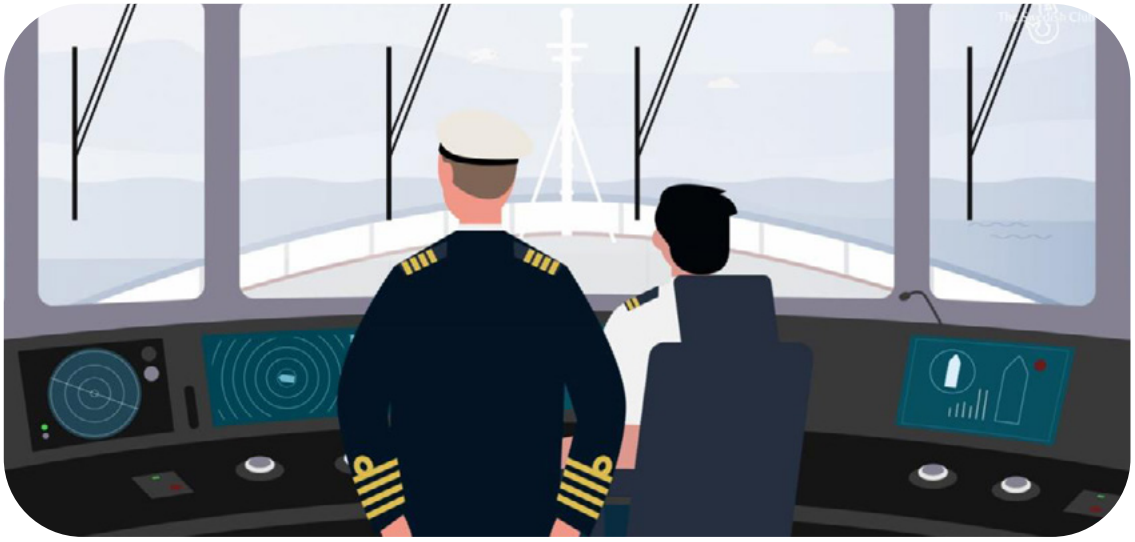
- Additionally, the information below in relation to the properties of calcium hypochlorite is included within the IMDG Code.
  - ‘May cause fire in contact with organic materials or ammonium compounds. Substances are liable to exothermic decomposition at elevated temperatures. This condition may lead to fire or explosion. Decomposition can be initiated by heat or by impurities (e.g. powdered metals (iron, manganese, cobalt, magnesium) and their compounds). Liable to heat slowly.’

5 Case 5 – (produced in 2021) – Collision in restricted visibility when approaching port

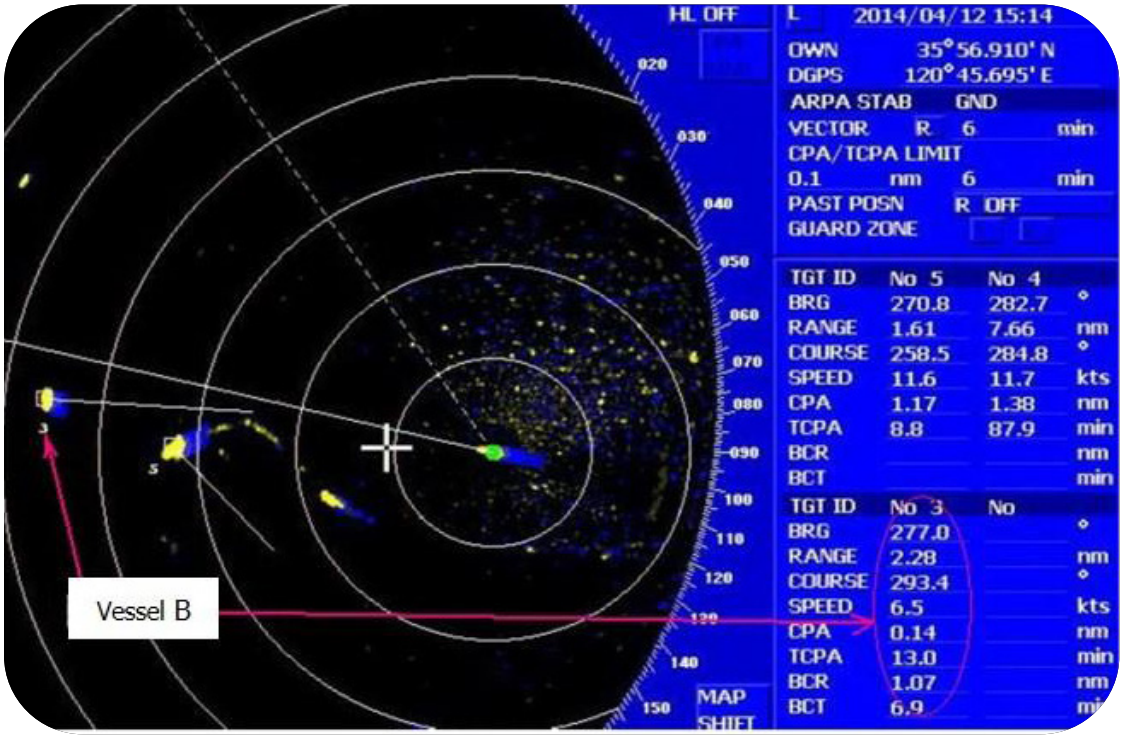
Vessel A, a 1000 TEU container vessel, was approaching the pilot station at 17 knots. The vessel was in manual-steering mode and was on a course of 280°. It was an afternoon, and the visibility was restricted to approximately 0.1 NM due to fog. The Bosun was on deck preparing the pilot ladder after which he would go to the forecastle to act as a look-out.

The bridge
The Master, the Second Officer and the AB were on the bridge. The Master had the conn, the Second Officer was monitoring, and the AB was on the wheel. Two ARPA radars were used alternatively on ranges between 6 NM, 3 NM and 1.5 NM. Both the Master and OOW were monitoring the vessel's progress on the radars.

Monitoring
The Master saw a target on the radar and acquired it on the ARPA as vessel B. The target was 10° on the port bow, 4 NM away with a CPA of 0.2 NM. Vessel A was overtaking vessel B. It could be seen that if vessel A maintained this course, it could hit vessel B on the starboard side. Vessel B was also on a course of about 280° and making a speed of 6 knots. The Master started the fog signal.



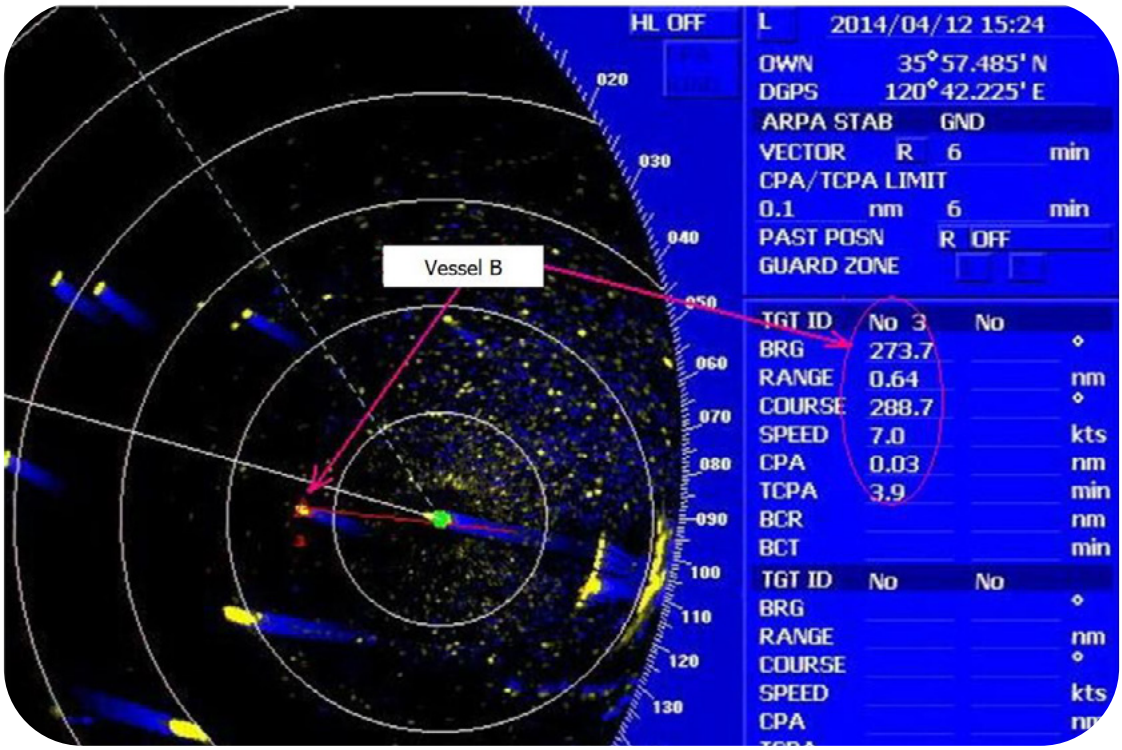
C -15 minutes: Vessel B was on course of 293°, and the CPA was 0.14 NM. Vessel A was maintaining its course and speed.



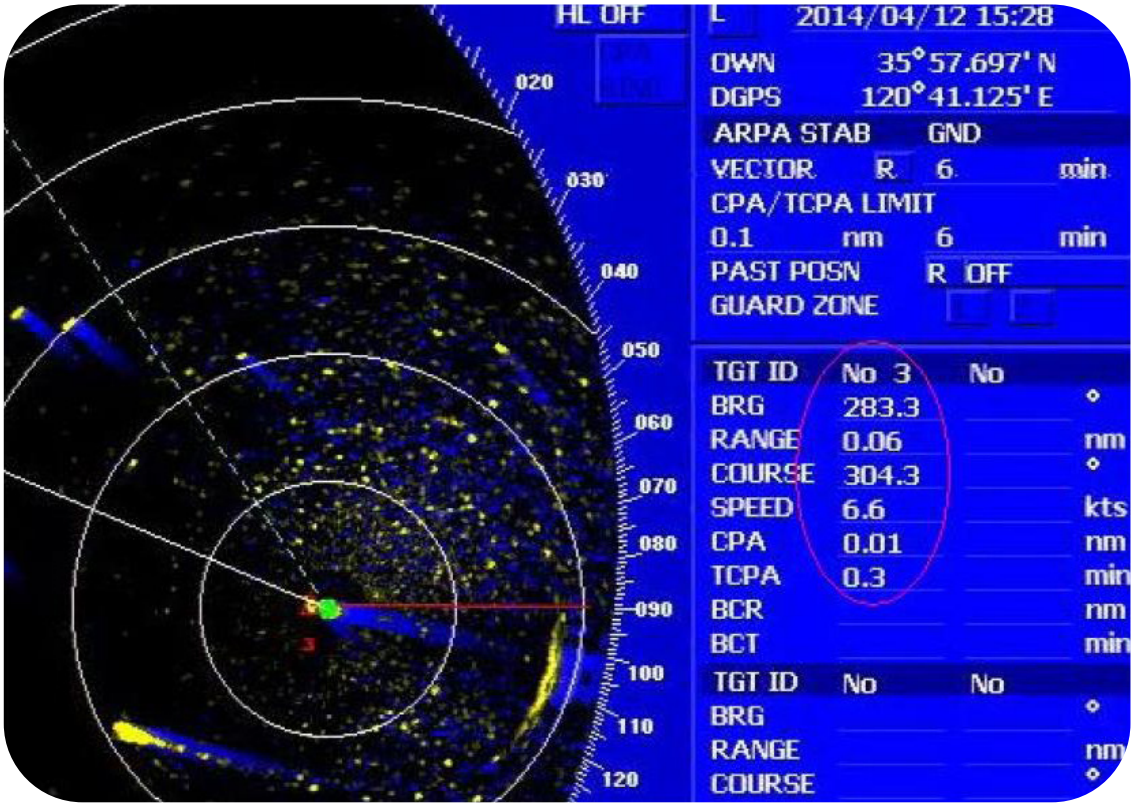
C -10 minutes: Vessel B's course was 285°, CPA 0.04 NM and distant 1.4 NM.



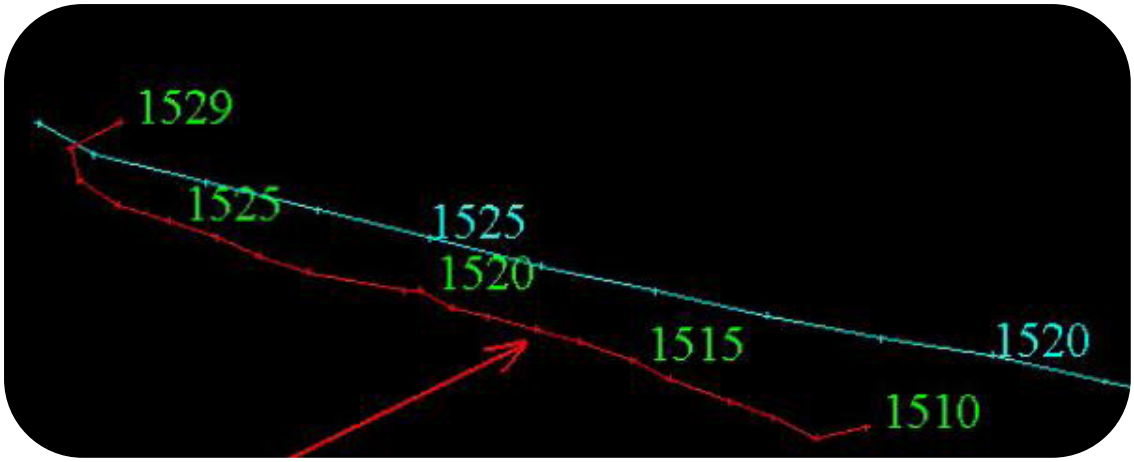
C -5 minutes: Vessel B's course was 289°, CPA 0.03 NM and distant 0.65 NM.



C -2 minutes: Vessel B's course was 304° and CPA 0.01 NM and distant 0.3 NM. Vessel B was still on the port bow of vessel A. At this point, the Master on vessel A realised that vessel B was very close and ordered hard to starboard and stop engines.



Collision: It was too late to avoid the collision and vessel A struck vessel B on its starboard side about midships. The Master saw that vessel B was a small tanker. Shortly afterwards, vessel B began to list heavily to starboard, and the crew were forced to deploy the life rafts and abandon ship. They were all rescued by vessel A.



Vessel A is blue, and Vessel B is red.



5.1 Questions

1. What were the immediate causes of this accident?
2. Is there a risk that this kind of accident could happen on our vessel?
3. How could this accident have been prevented?
4. What action would you as the OOW or Master have taken after you had plotted vessel B?
5. Is 17 knots a safe speed for a container vessel in restricted visibility?
6. What do you think is an acceptable CPA in this situation?
7. Would you have stopped the engine at the same time as altering hard to starboard?
8. What sections of our SMS would have been breached if any?
9. Does our SMS address these risks?
10. How could we improve our SMS to address these issues?
11. What do you think was the root cause of this accident?
12. Is there any kind of training that we should do that addresses these issues?
13. Which COLREGs rules are relevant?
14. How does Rule 5 – Look-out apply?
15. How does Rule 6 – Safe speed apply?
16. How does Rule 7 - Risk of collision apply?
17. How does Rule 8 - Action to avoid collision apply?
18. How does Rule 13 – Overtaking apply?
19. How does Rule 19 - Restricted visibility apply?

Notes

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5.2 COLREGs

Rule 5 - Look-out: Every vessel shall at all times maintain a proper look-out by sight and hearing, as well as by all available means appropriate in the prevailing circumstances and conditions, so as to make a full appraisal of the situation and the risk of collision.

In this collision, neither vessel seems to have maintained proper look-out.

Rule 6 - Safe speed: Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions. In determining a safe speed, the following factors shall be among those taken into account: (a) By all vessels:

(i) the state of visibility
The OOW must have time to take proper and effective action to avoid collision as required under Rule 6 to be considered to have proceeded at a safe speed. Vessel A was making a speed of 17 knots in restricted visibility while approaching a congested area and a pilot station, and this would probably be considered not to be a safe speed in the prevailing circumstances. This is also emphasised in Rule 19.

Rule 7 - Risk of collision:
(a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if the risk of collision exists. If there is any doubt (then), such risk shall be deemed to exist.

(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of the risk of collision and radar plotting or equivalent systematic observation of detected objects.

Vessel B was plotted on the ARPA on board vessel A and showed a small CPA. Despite the small CPA, no action was taken by the bridge team on vessel A.

At about C-15, the CPA to vessel B was 0.14 NM, which indicated that a risk of collision existed between the vessels. Visibility was restricted, and so it was even more important to ensure that the CPA was large enough to account for any margin of error in the equipment. As per ARPA performance standards regulation, the CPA should be calculated by the ARPA within three minutes with an accuracy of within 0.5 NM. This means that if the ARPA reports a CPA of 0.5 NM, the actual CPA could be 0.0 miles or 0.5 miles. The bridge team must factor in this margin of error of the CPA when planning any collision avoidance manoeuvres and the passing distances to other vessels.

Rule 8 - Action to avoid collision:
(e) Any action taken to avoid collision shall be taken in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.

(f) Any alteration of course and/or speed to avoid collision shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel observing visually or by radar: a succession of small alterations of course and/or speed should be avoided.

It is prudent and good seamanship to take action at an early stage by altering course and/or reducing speed to open up the CPA. In this case, neither vessel took any action to avoid collision.

Rule 13 – Overtaking:
(a). Notwithstanding anything contained in the Rules of part B, sections I and II, any vessel overtaking any other shall keep out of the way of the vessel being overtaken.

Vessel A was overtaking vessel B.

Rule 19 Restricted visibility:
(a) This Rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.

(b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have her engines ready for immediate manoeuvre.

(d) A vessel which detects by radar alone, the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible, the following shall be avoided:
(i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken:
(ii) an alteration of course towards a vessel abeam or abaft the beam. In restricted visibility, both vessels have a requirement to stay clear of each other. It is likely that vessel B was altering course as per her passage plan. It is still the responsibility of vessel A to ensure they stay clear of vessel B as per Rule 19.

5.3 What can we learn?

- The bridge team on vessel A acquired vessel B on the ARPA at about C -15 minutes. The CPA was 0.14 NM. With such a small CPA, this should be considered a close quarter situation. At this point, the bridge team had time to make an alteration to ensure the collision was avoided, but no action was taken on vessel A.

- When sailing in restricted visibility, all vessels have a responsibility to stay clear of each other. All vessels also have a responsibility to proceed at a safe speed which ensures that they can stop quickly. Maintaining full speed in restricted visibility under these navigational circumstances could be considered proceeding at an unsafe speed. Vessel A was approaching a pilot station in restricted visibility which meant there was also an increased risk of encountering a greater concentration of different types of vessels.

- In restricted visibility, both vessels have an obligation to stay clear of each other. However, we do not know why vessel B altered to starboard. It is possible vessel B altered course in accordance with its passage plan. Vessel A was overtaking vessel B, which required vessel A to stay well clear of vessel B.

- It is important that the officers understand the rules and increased risks when sailing in restricted visibility. It is also important to understand the limitations of the navigation equipment. It appears that the bridge team on vessel A considered a CPA of 0.14 NM to be an acceptable CPA. To ensure situational awareness is maintained, the bridge team should discuss all plotted targets, what risks they pose and take appropriate action.


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