The Swedish Club

Loss Prevention Training

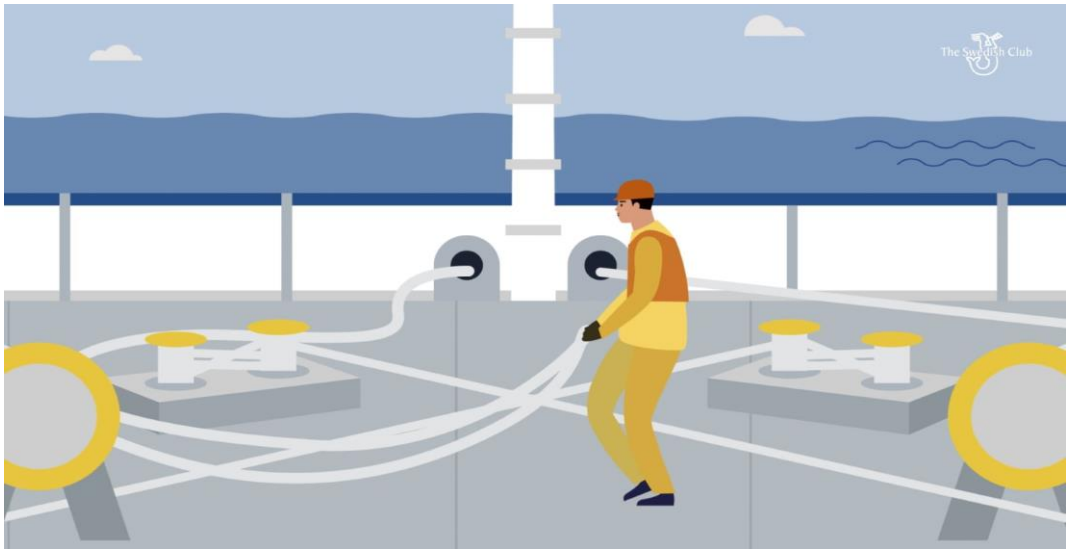
Online

HANDOUTS

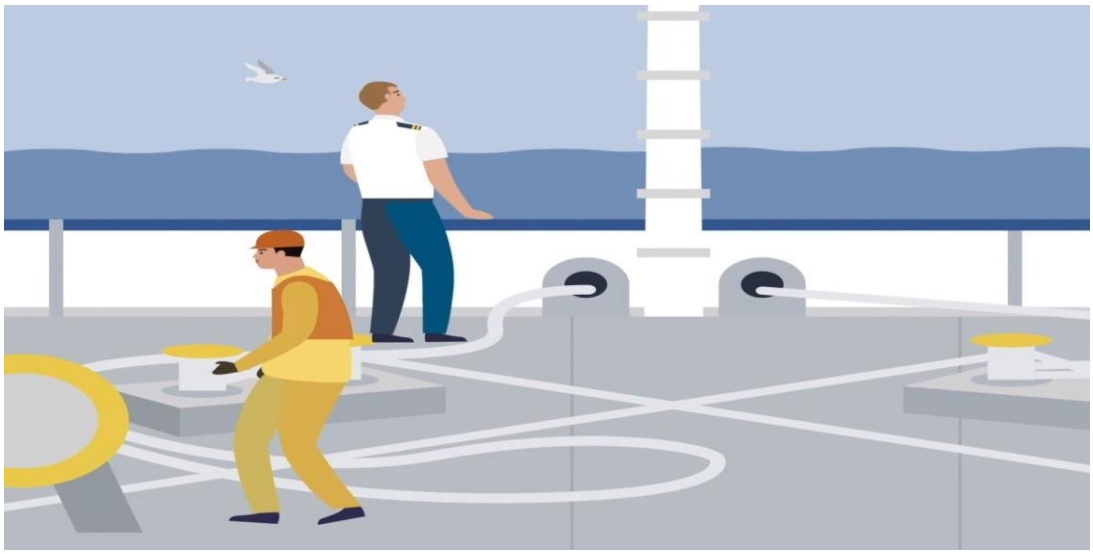
Contents

1 Case 1 – He lost his leg during mooring operation

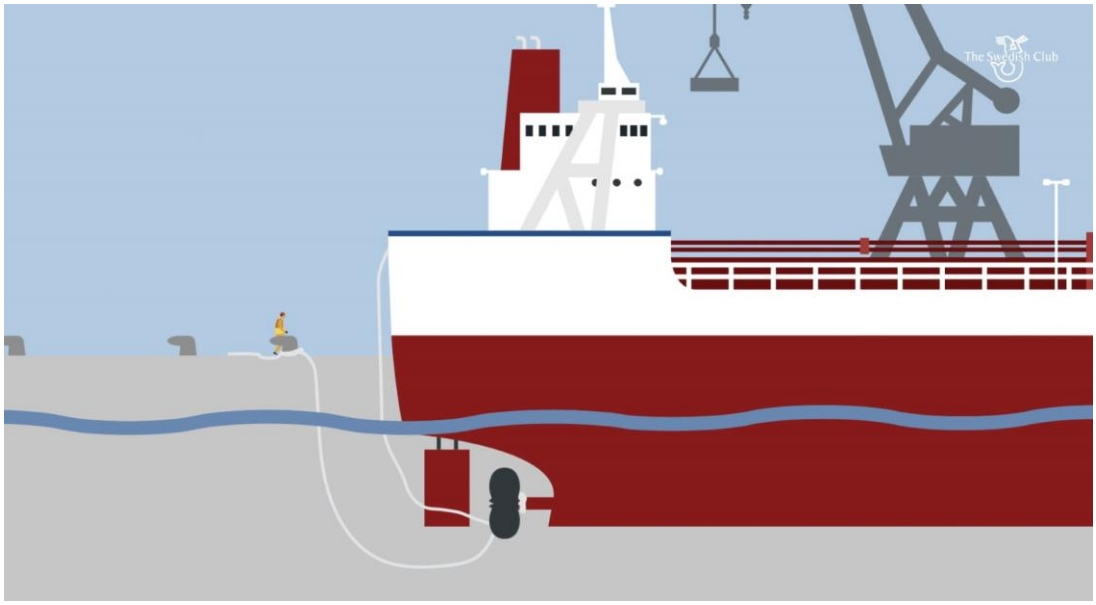
It was early morning, and the vessel was approaching the port. There was no wind or currents. On the stern, an AB was preparing the mooring ropes. The stern lines were put partly around a bollard with a bight at a right angle to the normal pull direction. After the AB had prepared the mooring lines, 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 shore-side 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 they 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?

3. How could this accident have been prevented?

4. How do we send mooring lines ashore?

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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.

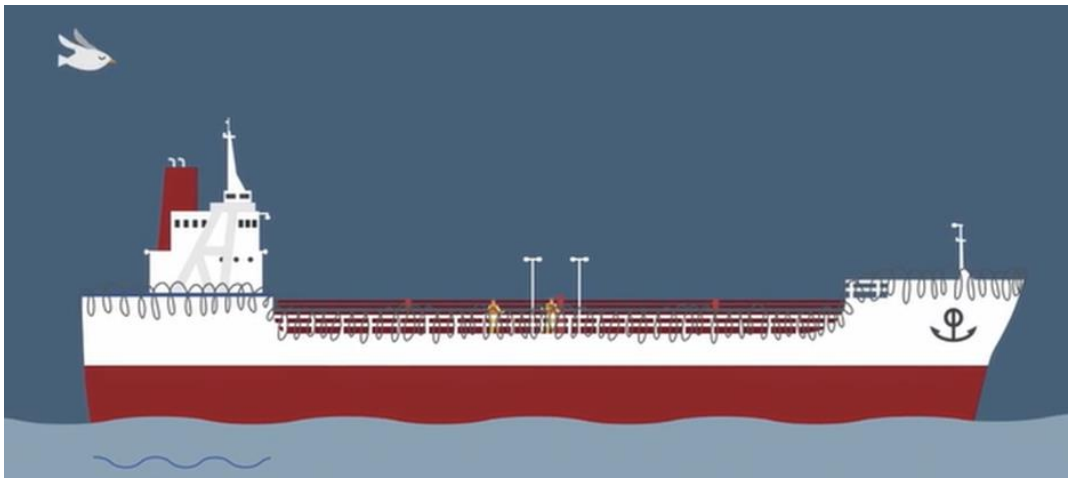
- Another risk was that the mooring line was partly around the bollard, with a bight and a right angle to the normal pull direction. This arrangement caused the snapback zone to cover the entire area between the bollard and railing. When the rope ran out rapidly and became caught in the propeller, it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

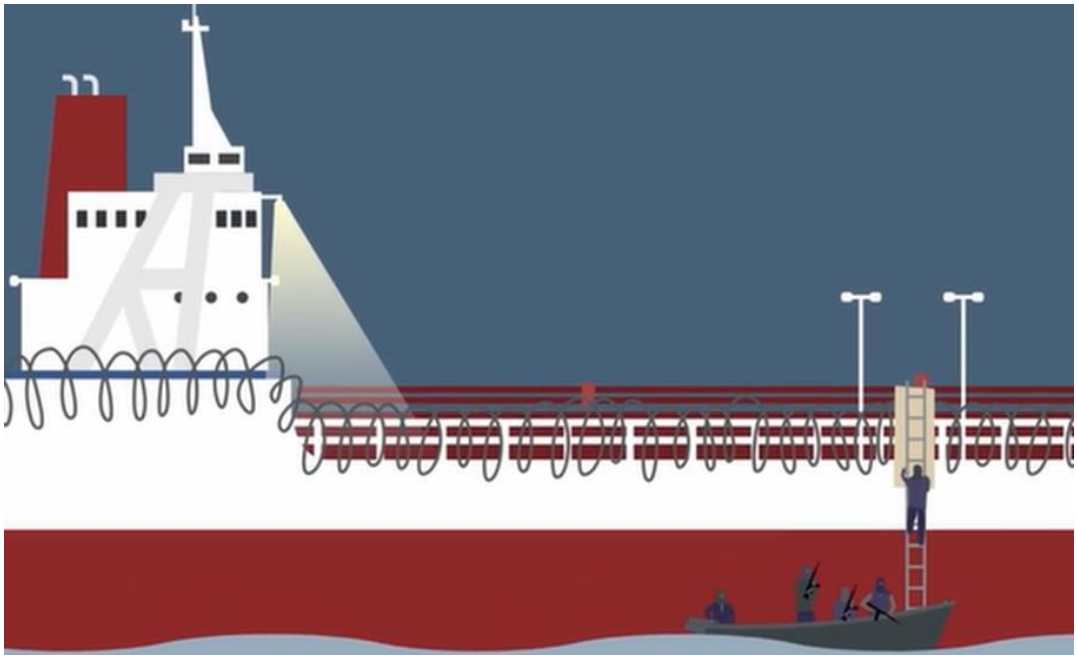


Two ABs were assigned to the poop deck and forecastle, but they were also to monitor the main deck. The crew prepared the deck and attached a single coil of barbed wire on the poop deck, forecastle and on the railing around the vessel; locked all doors and turned on all the outside lights. The Chief 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.

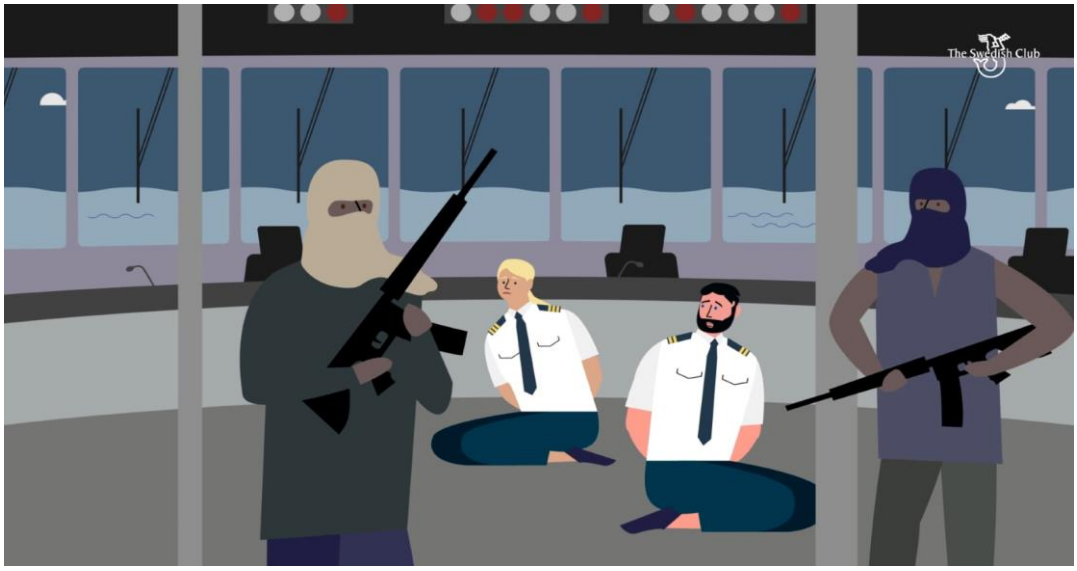
After midnight the Second Officer was on watch and was monitoring a dedicated VHF channel that the local navy was broadcasting on. The main engine was kept running so the vessel could manoeuvre instantly, and two ABs carried out regular patrols on deck.

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, this 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.

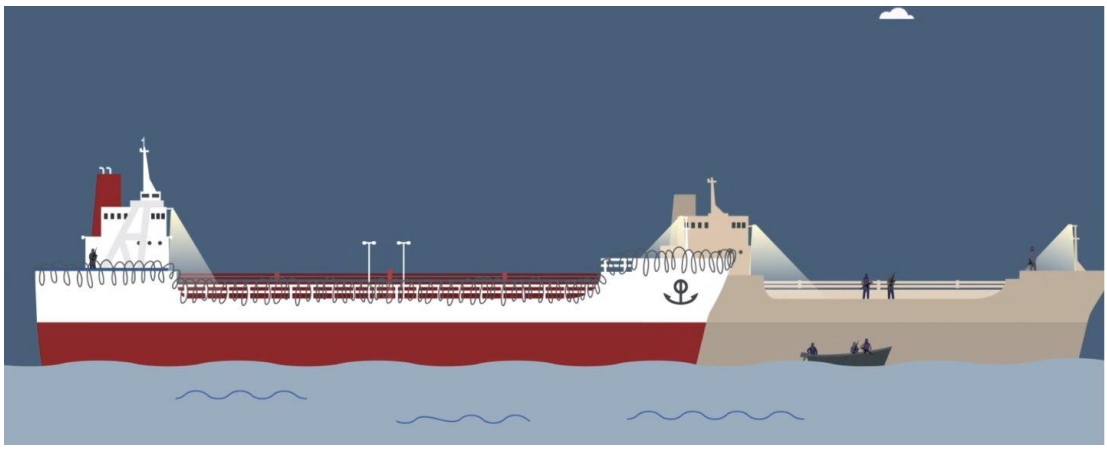


The Second Officer was told to show two of the pirates to the Master's cabin, and the other three remained on the bridge with an AB and the Chief Engineer. The Master was forcefully woken up, beaten and forced to open the safe and give all the money to the pirates. When the Master was taken to the bridge,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

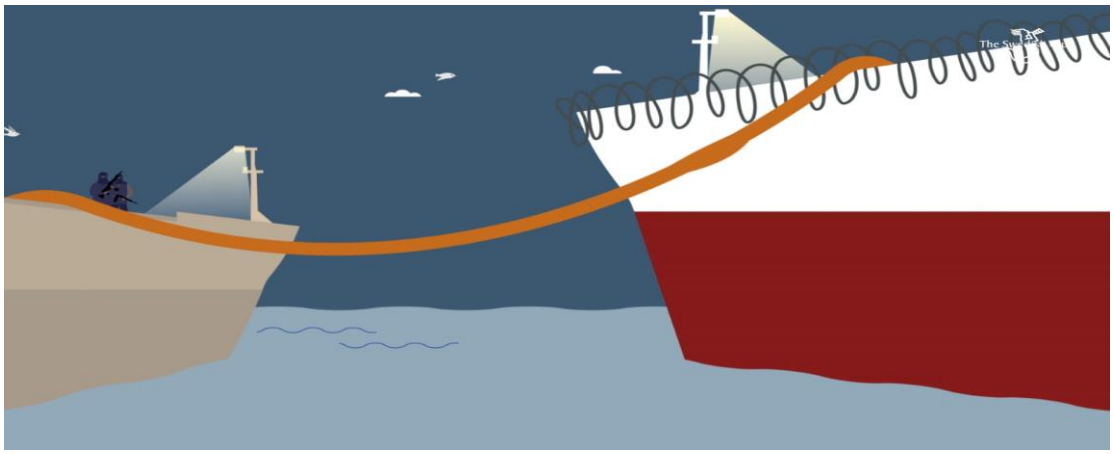
One of the pirates identified himself as the leader and explained to the Master that all the crew should be summoned to the mess room. If anyone resisted or tried to sabotage anything on the vessel, he would be killed.

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?

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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 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.

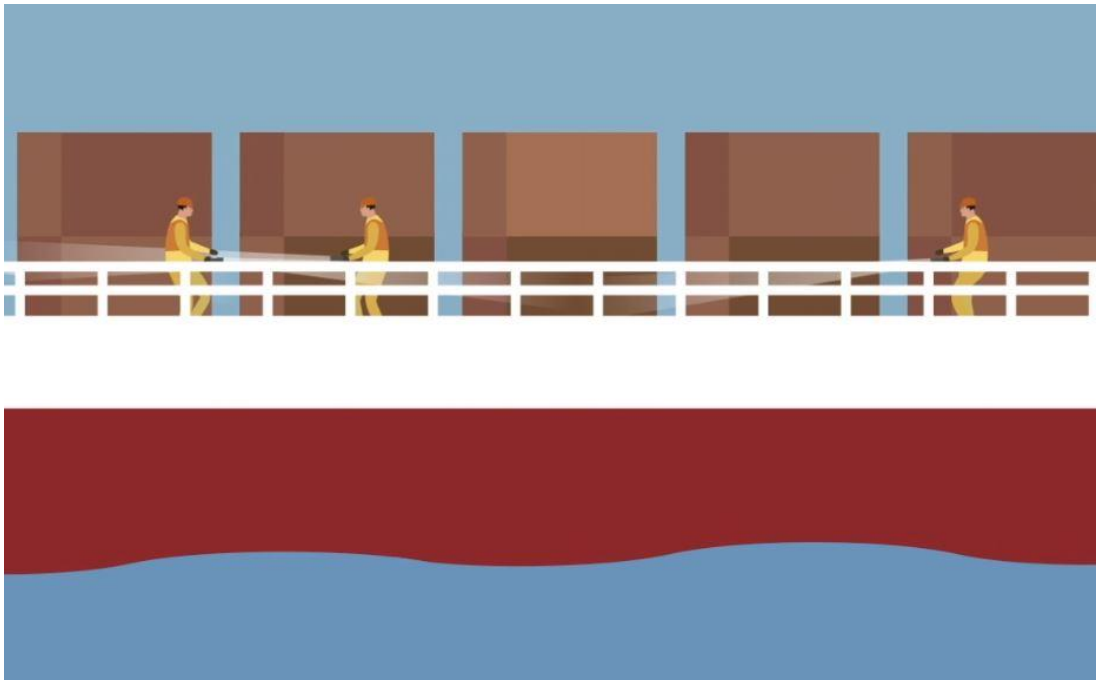
- Report to MDAT-GoG (the Maritime Domain Awareness for Trade – Gulf of Guinea, operated jointly by French and UK Navies); watchkeepers@mdat-gog.org, emergency tel: +33(0) 298 22 88 88.

- 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 - Stowaways in the steering gear trunk

A container vessel had departed from Lagos, and the next port of call was in Malaysia.

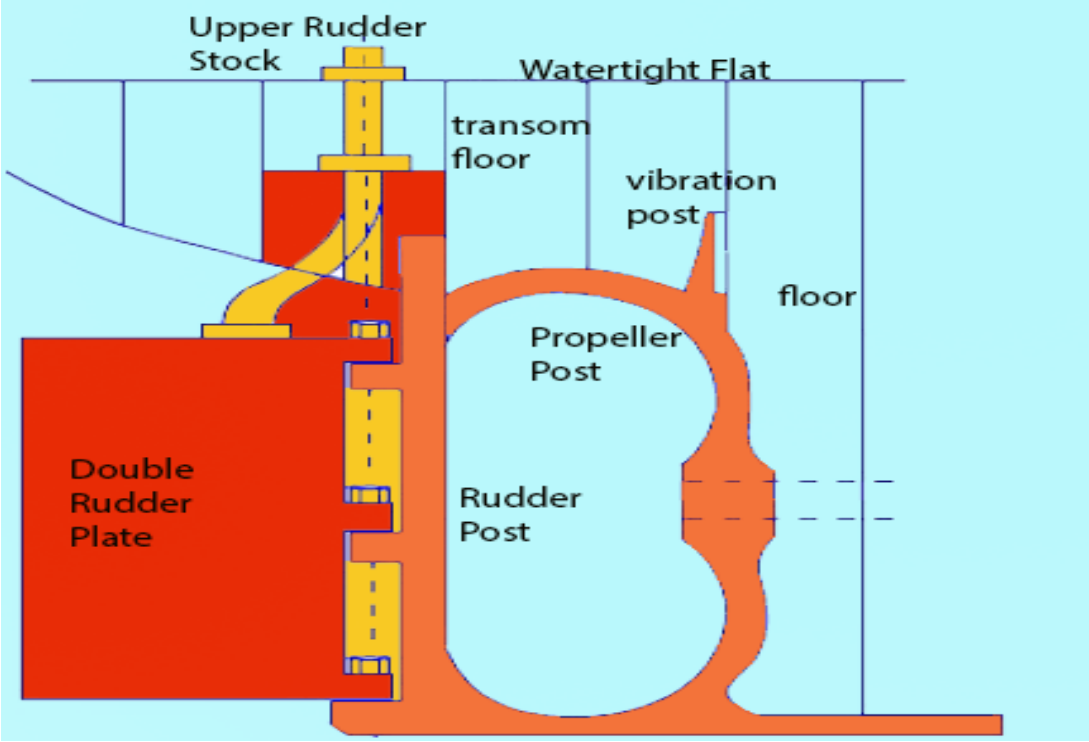
Before departure, the crew performed a stowaway search as per the Ship Security Plan. No stowaways were found.



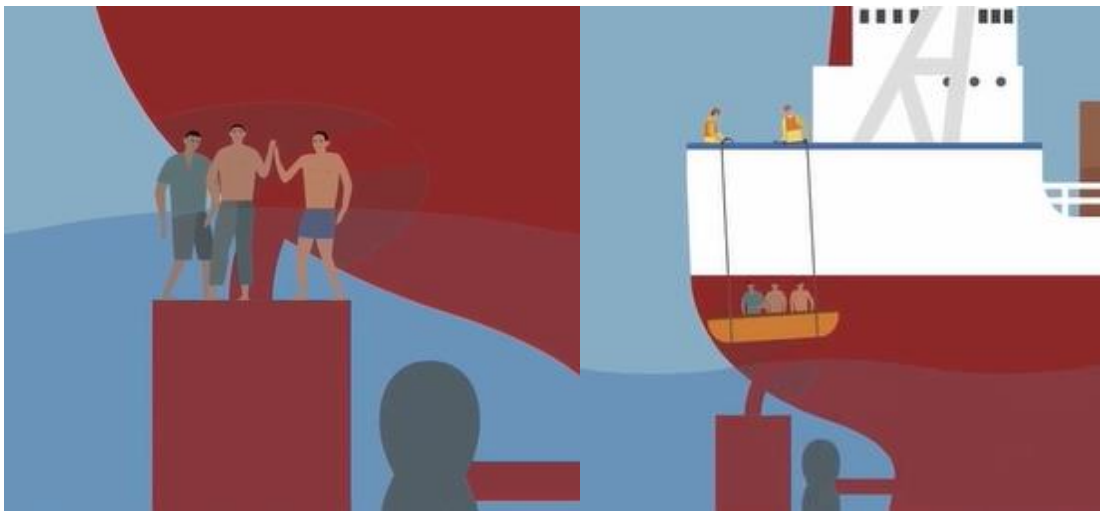
The vessel departed, and after disembarkation, another search was carried out. Still, no stowaways were found.

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?

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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.

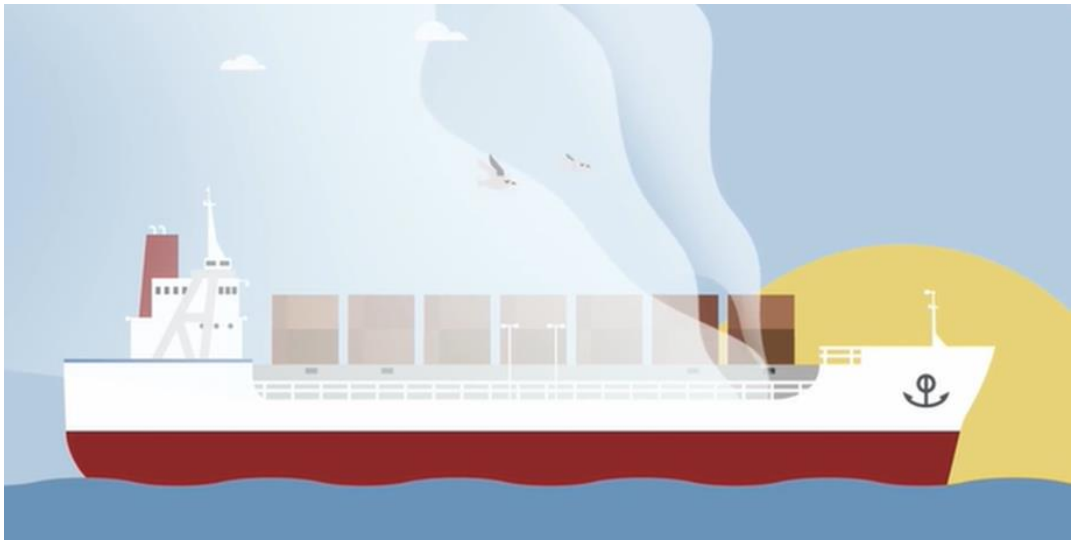
- While the stowaway remains on board, the immigration authorities in all ports of call should be informed of his/her presence and their status as a stowaway. Failure to inform the authorities properly can result in fines against the vessel.

- 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.

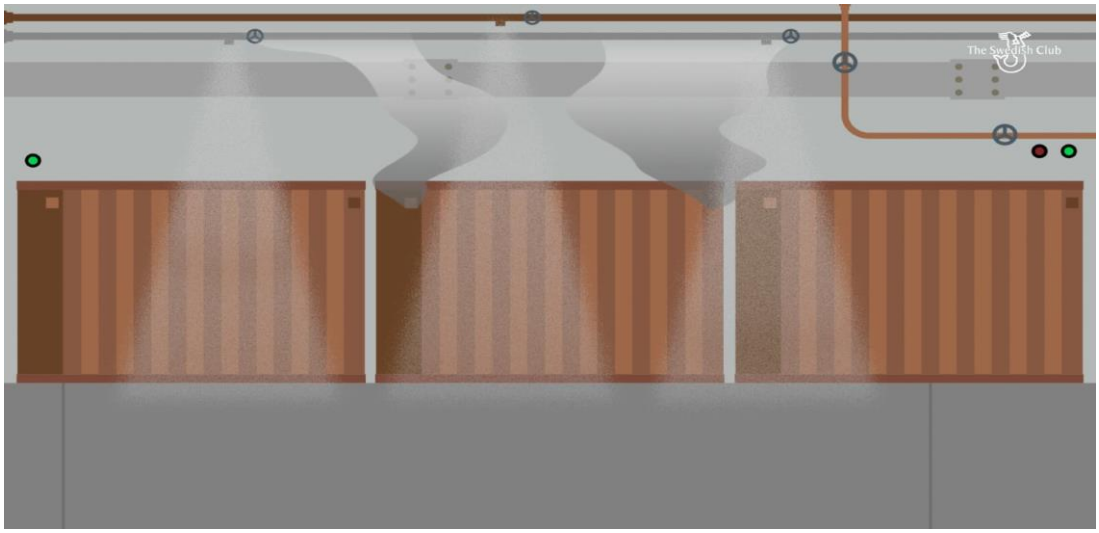
4 Case 4 - Misdeclared container caused fire

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”.



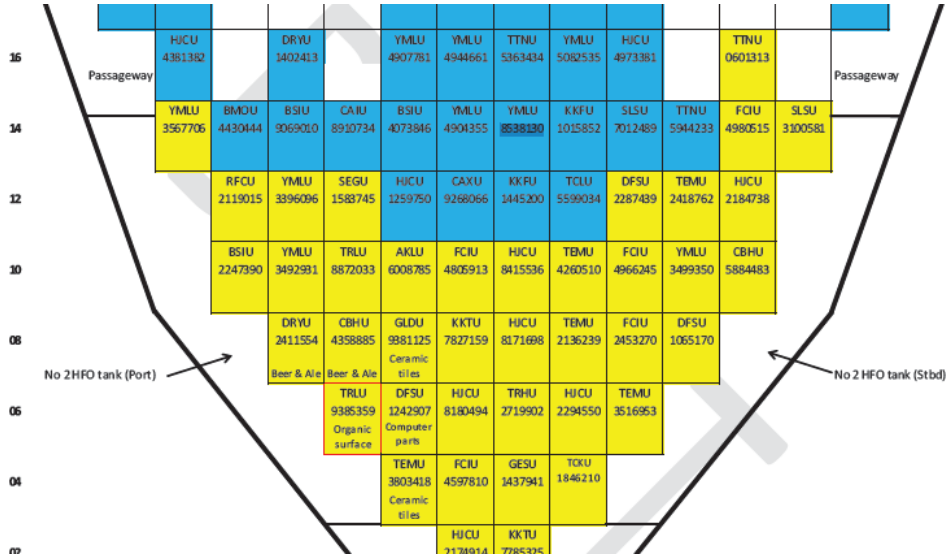
The ventilation fans for the cargo holds were stopped. The fans for cargo hold 3 were not operating at that time, but natural ventilation was being provided for the holds as the covers for the vents were open. Crew members closed the covers of the vents for cargo hold 3, and no crew member entered the 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 CO_2 cylinders into cargo hold 3. This discharge was the designated full complement of CO_2 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 CO_2 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 CO_2 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.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14
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Passageway
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DRYU 1402413
YMLU 4907781
YMLU 4944661
TTNU 5363434
YMLU 5082535
HJCU 4973381
TTNU 0601313
YMLU 3567706
BMOU 4430444
BSIU 9069010
CAIU 8910734
BSIU 4073846
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 5599034
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
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CBHU 4358885
Beer & Ale
GLDU 9381125
Ceramic tiles
KKTU 7827159
HJCU 8171698
TEMU 2136239
FCIU 2453270
DFSU 1065170
TRLU 9385359
Organic surface
DFSU 1242907
Computer parts
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?
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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?

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?

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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 - Collision in restricted visibility when approaching port

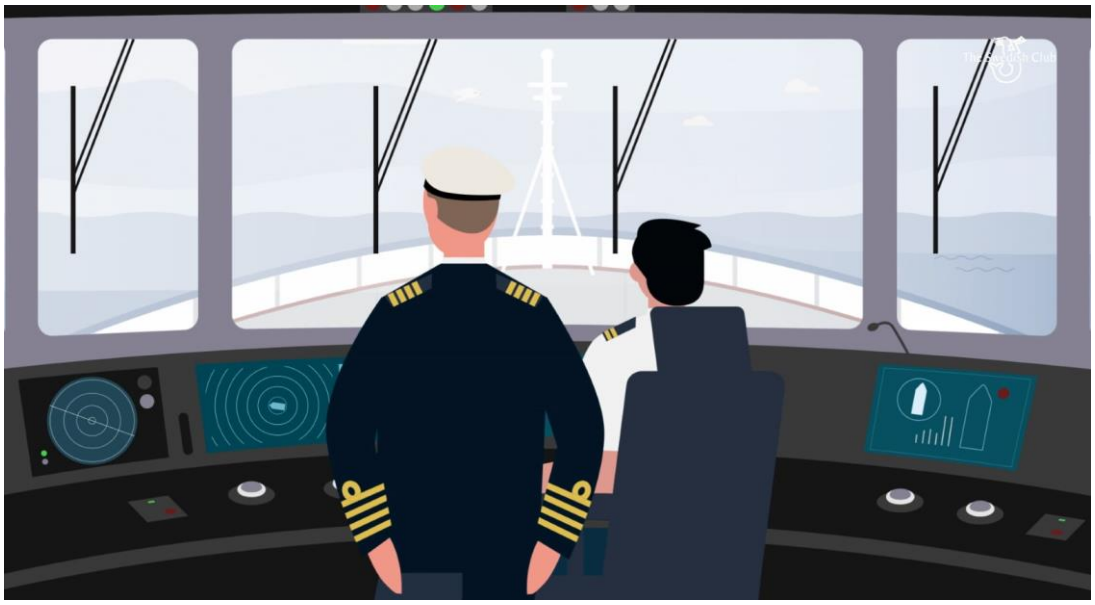
Vessel A, a 1000 TEU container vessel, was approaching the pilot station at 17 knots. The vessel was in manual-steering mode and was on a course of 280°. It was an afternoon, and the visibility was restricted to approximately 0.1 NM due to fog. The Bosun was on deck preparing the pilot ladder after which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

The bridge

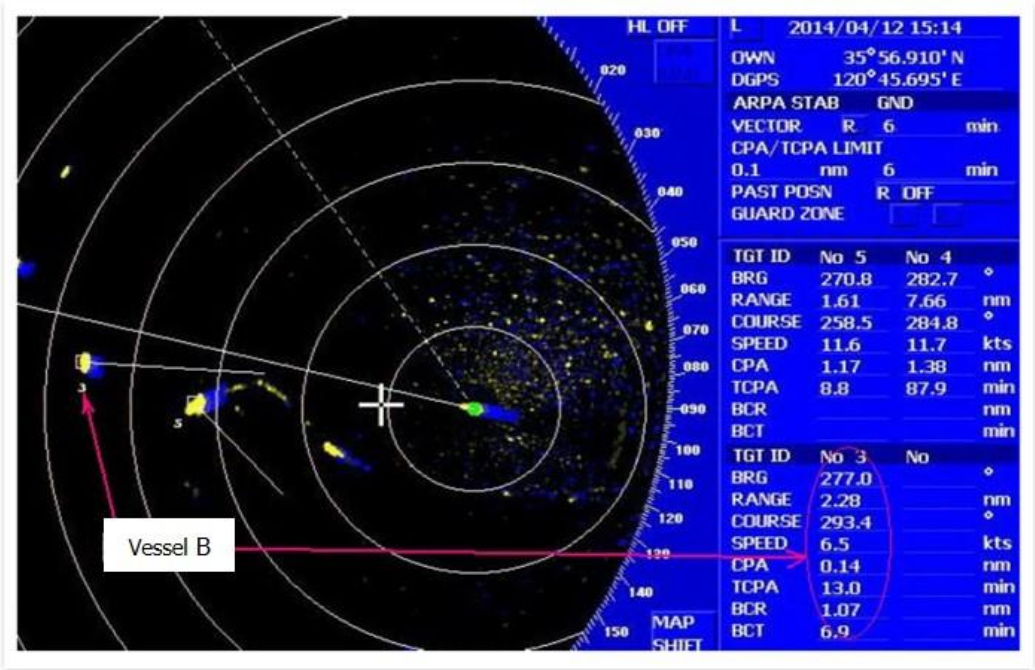
The Master, the Second Officer and the AB were on the bridge. The Master had the conn, the Second Officer was monitoring, and the AB was on the wheel. Two ARPA radars were used alternatively on ranges between 6 NM, 3 NM and 1.5 NM. Both the Master and OOW were monitoring the vessel's progress on the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

Monitoring

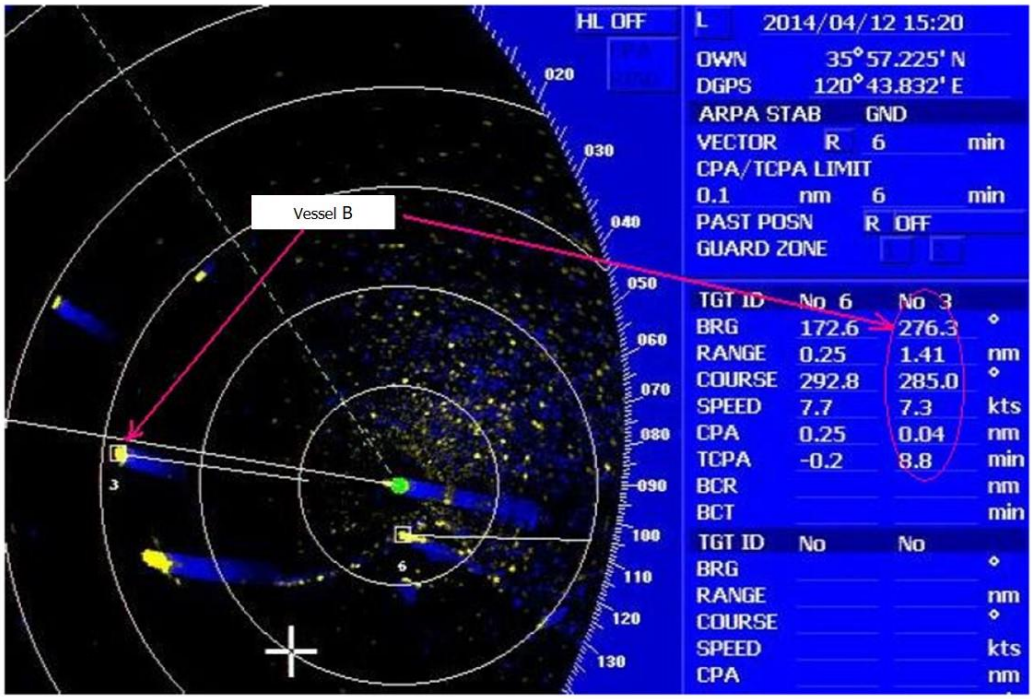
The Master saw a target on the radar and acquired it on the ARPA as vessel B. The target was 10° on the port bow, 4 NM away with a CPA of 0.2 NM. Vessel A was overtaking vessel B. It could be seen that if vessel A maintained this course, it could hit vessel B on the starboard side. Vessel B was also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



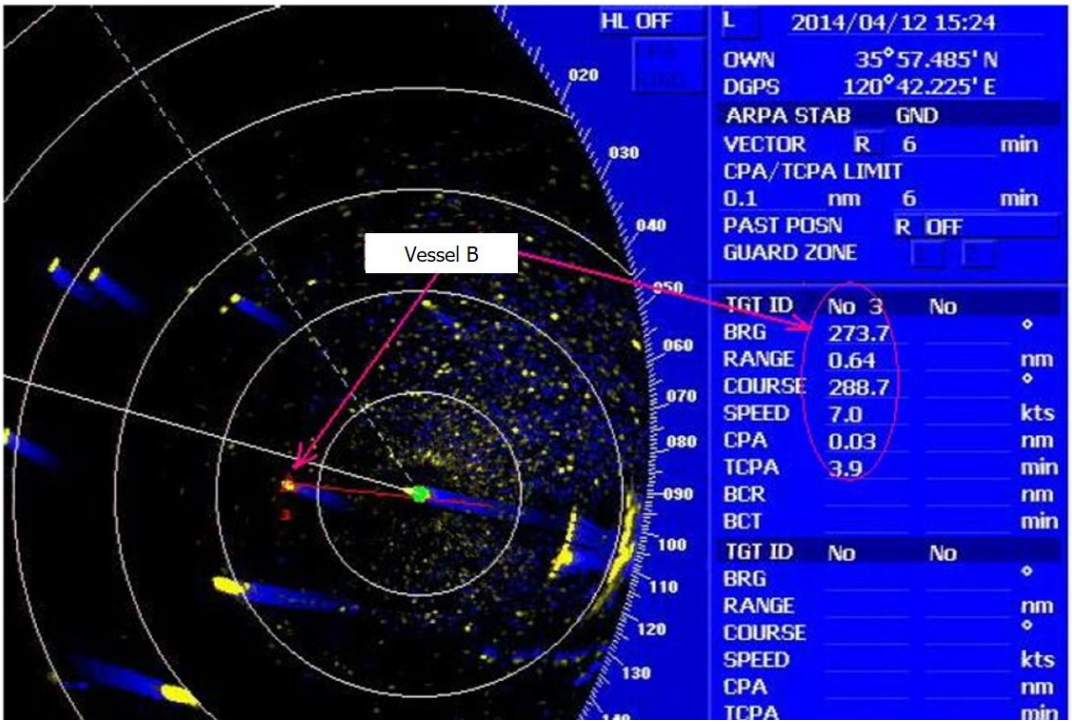
C -15 minutes: Vessel B was on course of 293°, and the CPA was 0.14 NM. Vessel A was maintaining its course and speed.



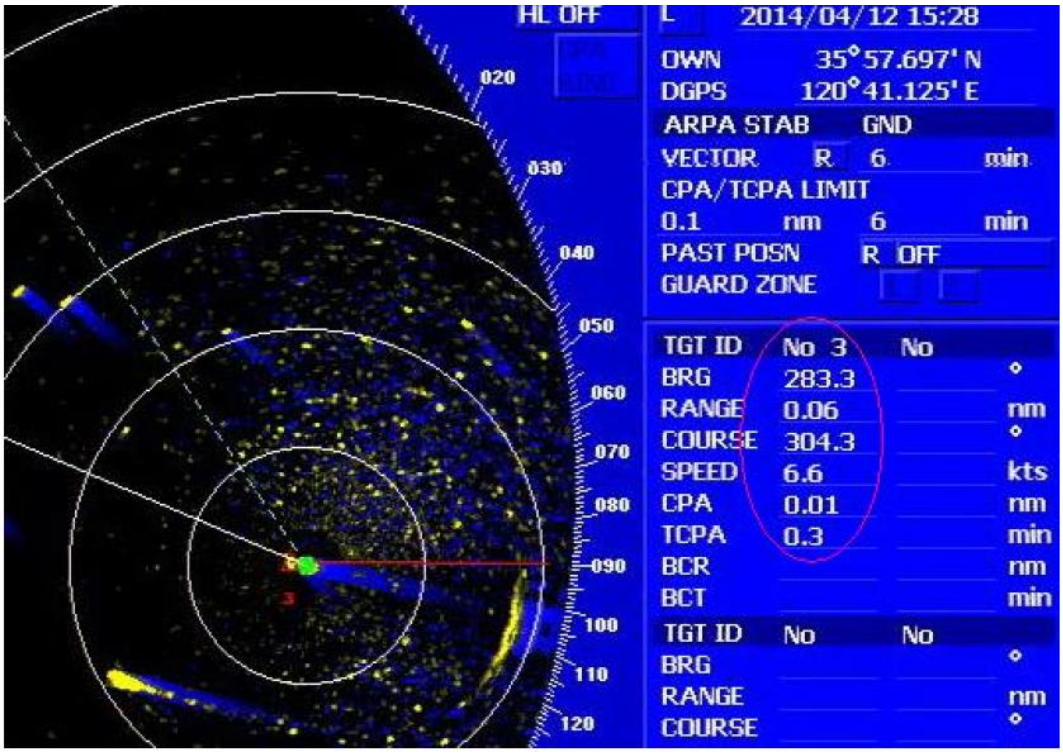
C -10 minutes: Vessel B's course was 285°, CPA 0.04 NM and distant 1.4 NM.



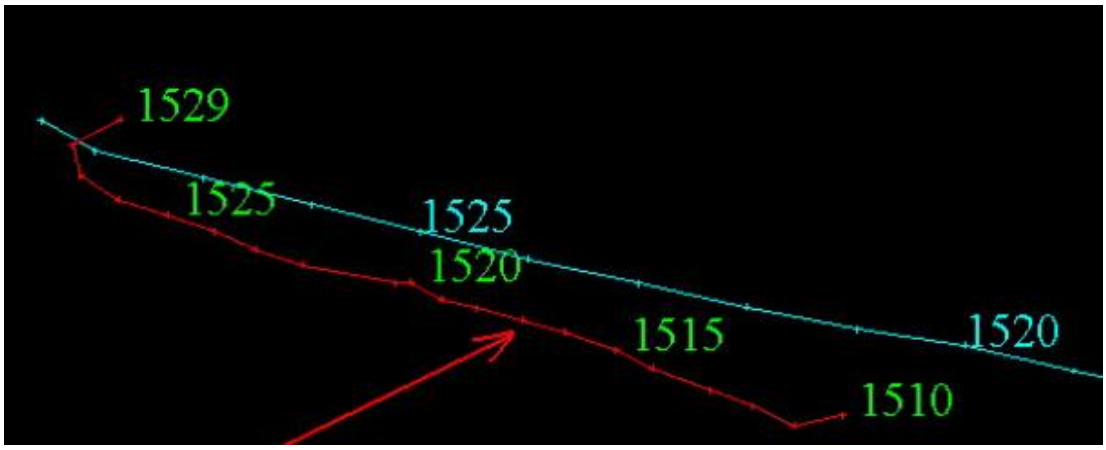
C -5 minutes: Vessel B's course was 289°, CPA 0.03 NM and distant 0.65 NM.



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:

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?

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.