The Nautical Institute
Marine Accident Reporting Scheme
MARS Report No 198 April 2009

MARS 200921

Dragged anchor and grounded

Official report: adapted from MAIB UK report, January 2009

A small tanker, anchored off the south coast of England, awaiting her turn to discharge cargo at a river berth. During a storm that passed three days later, the vessel dragged anchor and, despite the master's attempts to use the engine, was blown on to the lee shore and ran aground on shoals. The vessel sustained indentations to her hull and extensive damage to her rudder and steering gear, but fortunately there was no pollution and the vessel remained watertight.

The Marine Accident Investigation Branch (MAIB) database shows that since 1992, there have been 21 accidents in United Kingdom territorial waters involving merchant vessels of over 500 gross tons dragging their anchors and subsequently grounding. Weather conditions contributed to 19 of these accidents, the anchoring position was relevant to 16, and in seven cases, the engines were not ready when needed.

Safety lessons

The MAIB continues to see examples of vessels grounding, having dragged their anchors in heavy weather, because the masters, in general, have:

- Not planned the anchorage sufficiently;
- Not ensured that the anchor position is obtained on anchoring, and the bridge and safety swinging circles have been plotted;
- Not instigated an effective anchor watch which ensures the vessel's position is frequently and effectively checked;
- Not ensured main engine readiness is appropriate to the circumstances;
- Following warnings and forecasts of adverse weather, not reviewed their precautions and taken further steps as necessary;
- Remained at anchor off lee shores or in the vicinity of hazards in conditions exceeding, or forecast to exceed, the limitations of their anchor equipment and their ability to get underway safely.

To prevent such accidents occurring in the future, owners and operators are strongly advised to review their safety management system (SMS) procedures for anchoring to ensure they address the above safety issues and specifically:

1. That masters have clear guidance on the capability of their vessel's anchoring system including the:

i. Holding power of the anchor in various bottom types;

ii. Strength of the anchor system components, including that of the windlass;

iii. Effect of windage and yaw in various loading conditions.

2. The hazards to personnel working on the forecastle or cable deck in adverse weather;

3. That although an anchorage might have been allocated by a harbour or VTS authority, the safety of the vessel and decision to sail remains the master's responsibility;

4. And, most importantly, that masters should not hesitate to get underway or to seek a more sheltered anchorage should the forecast or actual weather and sea conditions warrant it.

MARS 200922

Collision in Dover Straits

Official report: adapted from IMO Flag State Implementation Sub-committee (FSI) report, 11th session

A passenger cruise ship collided with a container ship in a crossing situation in the Dover Straits. Both ships sustained serious damage including a very serious fire on the container ship.

Root cause/contributory factors

1. The attention of the passenger ship's OOW was diverted by other tasks in heavy traffic;

2. The container ship reduced its available options for avoiding action by overtaking another vessel from the port side just when a close-quarters situation was developing with the passenger ship.

Lessons learned

1. The collision could have been averted if one or both vessels had reduced speed in good time.

2. In heavy traffic situations, doubling of the watch should be considered if there is a possibility of the OOW being distracted by other tasks, such as the need for radio communication for reporting ship's position.

3. Vessels shall follow Rule 13 of the Colregs when overtaking any other vessel. In addition, when overtaking another vessel, careful consideration should be given to the side on which to overtake. Factors to be taken into account should include available sea room and the possible need to take avoiding action in respect of other vessels in the vicinity.

4. The OOW should not hesitate in reducing speed to avert collision if circumstances so require and should also be guided by Rule 8 (e) of the Colregs.

MARS 200923

Concentrate liquefaction caused capsize

Official report: adapted from IMO FSI report, 11th Session

A small general cargo vessel was loaded with a bulk cargo of 6,000 tonnes of pyrite concentrate. Soon after leaving the port, the cargo liquefied, forming a free surface and causing a severe list (angle of loll). The crew made several attempts to correct the list by ballasting, without success, with the vessel taking a severe list first to one side then the other. Eventually it capsized and sank. All the crew, however, were rescued.

Root cause/contributory factors

1. The moisture content of the cargo was excessive;

2. The cargo had been rained upon while on the wharf before it was loaded;

3. No moisture tests were carried out before loading and no information regarding the characteristics of the cargo had been provided to the shipowner or the master;

4. Once agitated by the motion of the ship, the cargo underwent liquefaction;

5. By ballasting incorrectly to correct the list, the ship's staff made the problem worse, until the vessel eventually capsized.

Lessons learned

1. All relevant information on the characteristics of the cargo being carried, including the transportable moisture limit (TML), must be provided to the shipowner, master and officers who must all make themselves familiar with this information.

2. When transporting cargoes subject to liquefaction, the moisture content of the cargo must be measured as close as possible to the time of loading.

3. The cargo must be inspected before loading.

4. Ships' officers should have a thorough knowledge of stability, particularly the difference between a static list and angle of loll caused by free surface and the appropriate ballasting measures to adopt.

5. Do not correct a list due to free surface (angle of loll) by ballasting the 'high' side.

■ **Editor's note:** All dry bulk cargoes must be transported strictly according to the recommendations in the bulk carrier (BC) Code. Concentrates and similar bulk cargoes that may liquefy are listed as group A cargoes and the Code specifies procedures and precautions to be taken by the shippers and masters of ships to ensure safety.

In many regions, such cargoes are loaded in anchorages from specially constructed barges that are capable of carrying these materials in a very 'wet' state. Even if pre-shipment documents are provided in good time, it is common for these ships to complete loading and sail without supervision or support from shore-based marine safety authorities and experts. Before commencing to load concentrates from such ports, masters should inform owners and their P&I Club representatives to ensure good liaison with shippers and to ensure proper sampling and testing of the bulk cargo ashore.

MARS 200924

Near-miss at anchorage

Recently I was looking for a parking spot in a car park when a car backed out on to my car. This reminded me of an incident some years ago, while arriving at Port Said anchorage. I was told to anchor one mile from Fairway buoy, the same order that was being given to every arriving ship. Looking for a suitable spot to anchor, I was passing between two rows of ships when, without warning, another ship that had just anchored on my starboard bow, suddenly backed out. Evidently, she was stretching the anchor cable by going astern on her engine. I stopped and went astern, warning the other ship on VHF. She promptly put her engines ahead and we missed each other. In the car park, the other driver was to blame – but at Port Said, who would have been the culprit?

MARS 200925

Unsafe tug operator

I joined an offshore tug as a chief officer pending promotion to master. During the initial period of four weeks, I was to familiarise myself with the ship and her operations. When I joined, there was only one anchor and both the log and echo sounder were not working, reportedly for almost a year. During my tenure as chief officer, we lost the only remaining anchor and the radar motor burned out. Under pressure from the shore management, the master continued to operate the vessel in this unsafe state. When I took over command, I insisted that the radar be fixed before sailing. [The reporter does not mention it, but it is presumed that the bower anchors and chain were replaced – Editor].

This was done but when I demanded that the echo sounder and water speed log also be repaired, I was told that the hull underwriters and P&I club were 'happy' with the current state of the vessel, and that they would send me a letter giving me indemnity from having to comply with Solas regulations. Needless to say it never arrived. Instead, I got an email from the managers stating that they were doing all in their power to resolve these defects as soon as possible and until such time, I was advised to 'exercise great care'.

When I refused to sail from port without the defects rectified, I was promptly relieved and was sent home on no pay. Not once did they contact me to find out the full story – and this is a company I have worked for for almost seven years. They are not a fly-by-night operation and have a good reputation. Unfortunately, it seems that when it comes to money, safety, health, environment and quality (SHE-Q) and human resources policies are sacrificed.

I feel I did the right thing and got punished for it. I have lost income and put myself under a lot of stress – and of course this affects my family as well. Later, I heard that the tug did run aground in the channel a few weeks later, probably aided by the defective echo sounder and radar, which had reportedly ceased to function again. I hope this serves as a notice to all seafarers against unsafe and unethical ship operators.

MARS 200926

Freon asphyxiation and frostburns

Note: For convenience, refrigerant gases are still referred to as 'Freon', a chlorofluorcarbon, by ships' crews although modern substitutes may be different in composition and properties.

On one of our ships, the second engineer came to the engine control room and found it extremely warm. He went to check on the A/C compressors. Noting a loss of Freon in the system, he decided to check for leaks. Based on his previous experience, he checked the switchboard room first, as similar leaks had occurred there before. On entering the switchboard room he 'smelled' Freon gas and instantly started to feel dizzy. Fortunately, he managed to turn round and made it out of the room safely.

Having left the switchboard room, the engineer had to sit down in order to recover from the dizziness. After this near-miss, the room was entered with breathing apparatus, the source of the Freon leak was found, the system was isolated, the leak repaired and the room thoroughly ventilated.

On another vessel, a low level alarm of Freon in the refrigerator compressor was observed in the engine control room. The chief engineer decided to recharge the system, using a flexible hose linking a full Freon cylinder and the recharging valve located on the compressor. After recharging, he closed the supply valve on the cylinder, then closed the valve on the compressor and released the pressure from the hose.

After disconnecting the hose, the chief engineer observed that the recharging valve on the compressor was leaking. He decided temporarily to fit a threaded plug over the leaking valve to control the gas before a repair attempt could be made. He momentarily removed the leather glove he was wearing and while threading the plug, a jet of liquid Freon splashed on his left hand, causing severe frost burns. Fortunately the ship was in port, so he was taken for medical treatment ashore.

Root cause/contributory factors

1. Lack of procedures;

2. Inadequate situational awareness;

3. Poor risk assessment;

4. Failure to use personal protective equipment (PPE) properly;

5. Failure of the recharging valve spindle; or

6. Recharging valve not closed properly (due to hard turning of the spindle), which allowed Freon to escape.

Corrective actions

SMS procedures reviewed as health and safety hazards of refrigerant gases were not adequately addressed in the manuals.

Safety information

1. Any crew member, who discovers that there is a Freon leak must:

- Move to an area of fresh air and warn other crew members;
- Inform the chief engineer immediately;
- Open up windows and doors and ventilate the space using fans or blowers, if practicable;
- If he feels any unusual health effects, seek medical advice.

2. All crew members should be aware of the hazards which may be associated with handling of refrigerants on board.

3. Freon vapour is heavier than air and may accumulate in low-lying areas, at deck level, displacing oxygen and posing an asphyxiation hazard.

4. Odour is not an adequate indicator of the presence of Freon and does not provide reliable warning of hazardous concentrations.

5. Freons are generally non-flammable and non-combustible, however, when involved in a fire or in contact with heated surfaces (>480°C), Freons decompose producing hydrogen chloride, hydrogen fluoride, phosgene, and chlorine. All of these decomposition products are acutely toxic and are very hazardous even in low concentrations.

6. Freons are incompatible with perchloric acid, chromium trioxide, nitric acid, chemically active metals (such as aluminium and zinc), alkali metals (such as sodium and potassium); and alkaline earth metals (such as beryllium, magnesium, and calcium).

7. Freons generally have a low order of toxicity. However, exposure to relatively high concentrations (>100 ppm) may produce adverse effects on health. Possible exposure routes include inhalation, ingestion, skin and eye contact.

8. Freon vapour may cause irritation of the eyes, nose, throat, and mucous membrane at low concentrations. At high concentrations, Freon vapour may cause pulmonary oedema and neurological problems such as central nervous system depression, dizziness, headache, drowsiness, tremors, seizures, confusion, lack of coordination, loss of consciousness, and paralysis.

9. Inhalation of high concentrations may also result in temporary alteration of the heart's electrical activity. The sensitivity of the heart to the arrhythmogenic action of epinephrine will increase, causing irregular pulse, palpitations, or inadequate circulation. Deliberate inhalation ('sniffing') may cause death without warning.

10. At extremely high concentrations; several thousand parts per million (ppm), Freon vapour has the potential to reduce the amount of oxygen available for breathing, especially in confined spaces, which can lead to asphyxiation.

11. Skin contact with liquid Freon can cause frostbite. Repeated skin contact with Freon gas may also cause drying with rashes.

12. Chronic exposure to Freon may produce weakness, pain, and paresthesias (a sensation of numbness, tingling or burning) in the legs. Chronic fluorocarbon exposure has been linked with motor, memory and learning deficits. Long-term inhalation of high concentrations may also lead to abnormal liver function with hepatic lesions.

First aid

1. Eyes – If eye tissue is frozen, obtain medical attention immediately. If eye tissue is not frozen, immediately flush eyes with large amounts of water for at least 15 minutes, occasionally lifting the lower and upper eyelids. If irritation, pain, swelling, tearing, or sensitisation to light persists, obtain medical attention as soon as possible.

2. Skin – If frostbite has occurred, do not rub the affected area. Flush with water or remove frozen clothing from frostbitten area and seek medical attention immediately. Otherwise, immediately remove contaminated clothing and wash contaminated area with soap and water for at least 15 minutes. Seek medical attention, especially if redness, itching, or burning is evident.

3. Ingestion – If Freons are ingested, do not induce vomiting, as the hazard of aspirating the material into the lungs is greater than allowing it to progress through the intestinal tract. Drink one to two glasses of warm water and obtain medical attention if necessary.

4. Inhalation – Move the exposed individual to fresh air immediately. If the person is not breathing, give artificial respiration. If the person has difficulty breathing, give oxygen. Seek medical attention.

Safe handling

Best practices for the safe handling of refrigerants include:

1. Store refrigerants in a clean, dry area out of direct sunlight, where temperature that does not exceed 50°C;

2. Never pressurise refrigerant systems or vessels with air for leak testing or any other purpose;

3. Never tamper with cylinder valves or pressure relief devices;

4. Never reuse or recharge disposable cylinders;

5. Wear protective clothing such as gloves and eye protection when handling any refrigerant;

6. Avoid contact with liquid refrigerant because frostbite may occur;

7. Avoid exposure to vapours through spills or leaks;

8. Evacuate the area if a large spill occurs. Return only after the area has been properly ventilated;

9. Verify proper cylinder hookup to the system;

10. Check to be sure the cylinder label matches the colour code;

11. Open cylinder valves slowly;

12. Avoid rough handling of refrigerant cylinders;

13. Do not perform any repair on pressurised equipment. Verify that the system has been completely evacuated with a vacuum pump before opening any lines;

14. Before welding or brazing, evacuate the equipment and then break the vacuum with air or nitrogen;

15. Always ventilate the work area before using open flames.

Feedback

MARS 200867
Scrap iron cargoes

It may be of interest to know that the British Scrap Federation, British Steel Corporation and the British Steel Producers Association have an agreed specification of iron and steel scrap. These address the issues of safety, cleanness, residual matter and other alloys and grading.

With reference to Gard's recommendation 4, regarding sending a letter to all parties concerned, this is all well and good but it should be borne in mind that the actual owner of the scrap may not be contactable as the title of its ownership passes from the shipper to the receiver when the goods cross the ship's rail in a free in and out stowed (FIOS) contract while it passes to the receiver when he receives the 'shipping' documents in a cost, insurance and freight (CIF) contract.