Marine Accident Investigation Branch (MAIB) - Safety Digest 01/1997

Contents

1. MOVEMENT OF TRAILER UNITS DUE TO HEAVY WEATHER

Narrative

A passenger/cargo Ro-Ro vessel, of about 21,000 Gross Tons (GT), was employed on a short/medium sea crossing between the UK and Continental Europe; one return voyage being made each 24 hours. The vessel had three vehicle decks, the uppermost being open, all of which were loaded via the stern door or, for non Ro-Ro units, lifted directly onto the open deck using shore cranes.

On three consecutive crossings very poor weather was experienced which caused the vessel to roll heavily. Estimates of conditions suggested that winds were of Force 9 - 10 together with very rough seas and a heavy swell.

During the first two of these crossings several cargo units broke free from their securing arrangements. Other cargo units were damaged and broke free, and the vessel was also damaged.

On the third crossing no cargo units moved significantly. However, on inspection shortly before berthing it was found that heavy items of cargo had shifted from open trailers and fallen to the deck, puncturing it in several places.

Observations

1. At each loading port all the cargo units were secured with suitable lashings for the forecasted poor weather conditions. The lashing system used was well proven.

2. Also, as far as was possible and practicable, all cargo units were inspected by ship's staff who rejected any which were judged to be unsuitable for carriage.

Comment

1. Very prudently no attempt was made to re-lash the cargo units at sea. However, their situation was monitored on CCTV.

2. Having decided to make the first of the three crossings with poor weather forecast, and seeing the effect of the conditions on his vessel and her cargo, it is a little surprising that the Master did not give greater consideration to postpone sailing on the following two crossings until the weather improved.

3. The damage which occurred on the third crossing serves to demonstrate that operators need to pay more attention to properly securing loads carried on their vehicles before boarding Ro-Ro vessels. The guidance contained in the Department of Transport's publication "Code of Practice: Safety of Loads on Vehicles" will be of assistance to the vessel's staff when assessing the safety of its load securing arrangements, before loading the vehicle.

2. ENGINE-ROOM FIRE WHILST ALONGSIDE

Narrative

This 9000 GT cable layer was alongside for maintenance and repair, with the crew assisting as required. Work started as usual and continued through the morning apart from a brief interruption when the fire alarm sounded. This alarm was caused by welding fumes in the engineers workshop. To prevent further alarms, this zone was isolated until the working day ended. At 1700 work finished for the day, all fire detector zones were activated and hourly fire patrols started.

At 2135, the fire alarm sounded indicating a fire in the engine-room. The local fire brigade were called and the ship's crew mustered on the cable deck. Shortly afterwards blackout occurred whilst the engine fire party were donning breathing apparatus. The engine space was closed down, all emergency stops operated and non essential crew sent ashore. The fire brigade arrived, were briefed on the situation, and a fire party entered the engine space at the lower level. A number of small fires were dealt with but intense heat was found in the engine control room area and the party withdrew. It was decided that CO2 total flooding of the engine space would be carried out, this being activated by the Chief and Second Engineers at 2238. Two pulls were necessary before the sound of escaping gas was heard and both men left the vessel.

From 2300, regular checks were made for local hot spots until 0500 the next day, when the engine-room was entered. The fire brigade found and put out a fire inthe main propulsion switchboard and subsequently vented the engine space. The engine-room was available for inspection at 0545. The seat of the fire was found by the starboard auxiliary generator with heavy fire damage extending upwards into the engine control room. An inspection of the CO_2 room confirmed that the bottles had not been discharged due to a fault in the cable operating mechanism. By 1500 the fire was declared out and the vessel safe.

Observations

1. The impingement of a spray of warm lub oil onto the hot exhaust of the starboard auxiliary generator, caused the generation of a vapour cloud and subsequent ignition. Flame and soot markings on the side of the generator, showed the source of that lub oil spray as being due to the loss of a venting valve fitted on the generator Duplex lub oil filter. The original vent cock had been replaced by a non standard valve at some time. The thread on the valve connection to the filter block was worn and with fluctuating oil pressures; it eventually worked loose.

2. The fire spread from the top of the generator to the main power cables carried on deck head cable trays. The fire burnt along the cable insulation, helped by oil impregnated dust and dirt, eventually travelling up into the underside of the switch gear in the control room above via unsealed cable entries - no cable transits being fitted due to the date of construction. The steel casing of the switch gear cabinet contained the fire although the considerable heat generated caused heat distortion and paint blistering at deck head level.

3. Despite having been inspected and serviced some four months earlier by the manufacturers agents, the CO_2 system failed due to the disintegration of the bulldog locking mechanism fitted to the operating pull wire. Subsequent examination showed that only one of the pilot cylinders had discharged, the second pilot bottle remained intact. The first stage alarm, indicating either a gas leak or that the main system was about to be operated, had tripped. The second pilot valve seal disc was found intact with no evidence of any attempted rupture. This suggests that the operating pull wire was not secure in the clamping pin

allowing the wire to move within the pin without operating the arm. Dismantling of the safety valve showed that although the operating arm had moved towards the maximum piercing position, causing an indentation in the disc, no rupture had taken place.

4. The CO_2 room adjacent to the operating station was kept locked, with the two emergency keys being kept in the engine control room and bridge respectively.

Comment

1. This incident illustrates the importance of structural fire protection and the maintenance of both fire integrity and insulation standards of bulkheads. Current regulations require the installation of approved cable transits for cable penetration of Class "A" and "B" bulkheads. The fitting of approved cable transits would have significantly restricted the spread of fire and the extent of the damage sustained.

2. The failure of the CO_2 system in itself was due to poor maintenance procedures by the contractor. It does show however the continual need to supervise and monitor contractors, particularly in respect of safety equipment maintenance carried out aboard the vessel.

3. The presence of a local emergency key to the CO_2 room would have allowed a visual check to be carried out on the operating mechanism when difficulties were experienced on the initial pull.

3. INCORRECT INSTALLATION OF LIFEBOAT DAVIT WINCH MOTOR

Narrative

A davit winch motor burnt out during the recovery of a lifeboat on a 37,583 GT ferry when she was alongside in port. Although a spare motor was fitted just before the vessel sailed, it was considered impracticable to test the motor at sea with the lifeboat stowed.

Three days later arrangements were made to test the motor when the vessel had returned to her home port.

The lifeboat was lowered approximately one metre from its stowed position and the motor was tested by the raise control button. The winch drum failed to move and a clunking/clicking noise was heard to come from the winch housing. The raise button was depressed a further two or three times with the same result.

The Electrical Officer was called and the raise button was again depressed. This time the winch started to lower the lifeboat and continued to do so, even after the power supply to the motor was isolated. The lifeboat eventually landed on the quay and was damaged. There were no injuries.

Observations

The power supply to the replacement motor had been incorrectly connected and caused the motor to rotate in the reverse direction.

1. The reverse direction of the motor damaged the locking pawls of the sprag clutch and rendered them ineffective.

2. No information was available on board regarding the required procedure for changing a lifeboat winch motor and staff were not conversant with the principles of operation of the drive/clutch/brake arrangement.

Comment

1. Immediately after the accident, the vessel's managers implemented the following procedures for changing lifeboat winch motors, which should prevent similar accidents occurring.

    1. The winch motor direction of rotation should be established and a suitable mark made on the gearbox casing adjacent to the motor.

    2. Before replacing the winch motor, the lifeboat should be securely stowed with the davit arms retained by the harbour pins.

    3. After fitting the motor, the correct electrical connections should be made. The lifeboat should then be lowered from its fully stowed position in order to enable a full function test to be undertaken. Suitable arrangements should be made to ensure that the quay area below the lifeboat is kept clear of personnel.

    4. Precise instructions should be given to ensure that all persons involved are fully aware of the schedule and requirements of the test. Appropriate information should be made available on board with regard to the operation and maintenance of lifeboat launching and recovery equipment.

4. NO LOOKOUT ON EITHER VESSEL

Narrative

A general cargo vessel of 1200 GT was on passage at night in the English Channel and correctly exhibiting the navigation lights for a power-driven vessel underway. The Master was the sole watch keeper. The vessel was being steered by auto-pilot on a heading of 279º(T) and an operational radar was set on the 6-mile range scale.

A 12-metre twin-hulled trawler had just hauled her net and was proceeding a head at reduced speed with the net trailing astern and clear of the twin propellers. She was showing the navigation lights for a vessel engaged in trawling and making way through the water. An operational radar was set on the 3-mile range scale and the vessel was being steered by autopilot on a heading of approximately065º(T). The Skipper was the only person on board.

Both vessels had their VHF radios switched on to Channel 16. The wind was westerly Force 2, with a slight sea and excellent visibility.

The Master of the cargo vessel observed what he considered to be the stern light of a vessel about 15º on the port bow, on a similar heading to his own. He decided that his vessel would overtake the other at a safe distance. He then went to the chart room in order to familiarise himself with the arrival procedures for his next intended port of call.

Meanwhile, the trawler Skipper had been checking the engine spaces and had found some water in the starboard compartment. He started the bilge pump and remained in the starboard engine space in order to check the machinery, grease the stern tube and tighten the stern gland.

After about five minutes, the Master of the cargo vessel returned to the wheelhouse from the chart room and saw a green light at close range fine on the port bow. He immediately turned the auto-pilot setting to starboard but the vessels collided.

The trawler passed the cargo vessel's port bridge wing about two metres off heading at right angles to the cargo vessel.

The trawler Skipper, having felt the impact, returned to the wheelhouse and immediately pulled the engine control levers to astern before he realised that the nets would become fouled as a result.

Although both vessels were damaged, there was no ingress of water. The trawler Skipper called HM Coastguard and reported the incident, but the cargo vessel continued her passage until HM Coastguard, calling on VHF Channel 16, managed to get her Master to respond and identify his vessel.

The trawler was subsequently towed into port by an RNLI lifeboat.

Observations

1. The Master of the cargo vessel failed to assess whether a risk of collision with the trawler existed and failed to keep a proper lookout.

2. The trawler Skipper, who was the only person on board, failed to keep any lookout because he was in the engine-room.

3. Insufficient use was made of the radar on both vessels for the purpose of identifying the possibility of a risk of collision.

4. The extent of damage to both vessels was substantial.

Comment

1. Following the collision, the Master of the cargo vessel made no attempt to stop or to communicate with the trawler as obliged to by Article 8 of The Collisions Convention 1910. Similar obligations, prescribed in Section 92 of the Merchant Shipping Act 1995, apply to UK vessels and other vessels in UK waters.

2. The trawler Skipper had been fishing at sea and had had no sleep for nearly 24 hours. It is possible that fatigue could have been a contributory factor in his not maintaining a lookout.

3. The absence of a crewman cannot excuse a Skipper, who chooses to operate his vessel alone, from the consequences of self-imposed fatigue, or the failure to maintain a lookout.

5. COLLISION WITH DISCHARGING CHEMICAL TANKER

Narrative

A 22,400 GT bulk carrier carrying a mixed cargo of 33,000 tonnes of grain and animal feeds was under port pilotage to her discharging berth with one tug made fast aft and two others in attendance. The weather conditions were good and, as the bulk carrier had a bow thruster and good manoeuvrability, the Master and Pilot had agreed that it was not necessary to make a tug fast forward to assist with a planned turn to starboard. The size of the bulk carrier and the usual preferred turn position meant that her bow would swing close to a chemical tanker which was moored at a berth adjacent to the turning basin. Partly because the forward tug had not been connected the Pilot chose to keep power and headway on to help with the turn. The vessel was turning to starboard and still making headway when the bulbous bow came into contact with the side of the chemical tanker, which was discharging a cargo of 4291 tonnes of sulphuric acid.

Although the chemical tanker was holed below the waterline which caused her to list rapidly to about 35º there were no injuries and there was no pollution as a result of the accident.

Observations

1. The port and its turning area had been laid out in times when vessels were smaller and the proximity of berths, now used for chemical and gas carriers, was not considered to present an undue hazard.

2. It had become common practice for large bulk carriers to swing on the edge of the designated turning basin and close to the chemical berths in order to better facilitate manoeuvring alongside the grain berths.

3. The Pilot misjudged the amount of headway. The misjudgment was not noticed by the Master who was monitoring the pilotage on the bridge. Both the Pilot and the Master thought that the situation was under control until the last moment and, despite full astern power being applied, they were unable to avoid the collision. The Chief Officer on the forecastle had warned the Bridge about the decreasing clearance from the other vessel.

4. Serious pollution and/or loss of life was only narrowly averted. One of the tanker's wing ballast tanks and the ballast pump room was holed and the bulkhead of one of the full cargo centre tanks was distorted. The cargo containment was not affected.

Comment

1. The manoeuvring of large vessels intentionally close to moored tankers or gas carriers should be avoided if practicable to do so. The Harbour Master of the port where this accident occurred has now instigated a 150 metres safety zone around all moored chemical tankers adjacent to the turning area.

2. It should be recognised that tugs which are already made fast can quickly provide assistance in emergency situations. In deciding on the number of tugs to make fast Masters and Pilots should consider all possible contingencies.

6. SNAGGING LEADS TO LOSS OF FISHING VESSEL AND SKIPPER

Narrative

A 24.35 metre long fishing vessel, with a crew of six, snagged her fishing gear on an underwater obstruction whilst bottom trawling. The snagging caused her to heel heavily to port and to take on water. After sending a distress signal by M Fradio, two inflatable liferafts were launched. The flooding continued and the vessel sank in a position more than 60 miles from the nearest land.

Five of the crew were rescued by another fishing vessel, which had seen the distress flares fired from the liferafts. Unfortunately, the Skipper had been unable to board a liferaft and was lost. None of the crew had been wearing life-jackets.

The immediate cause of the accident was an uncontrolled ingress of sea water into the vessel. Subsequently the main onboard electrical system failed which prevented release of the hydraulically operated brakes on the trawl winches and release of the tension in the snagged towing hawsers.

Observations

1. The crew had been unaware that there were any problems in releasing the winch brakes when there was no hydraulic power.

2. No Urgency (PAN PAN) message was broadcast, nor was the two-tone distress alarm activated during the early stages of the incident. By the time the MAYDAY was broadcast, the vessel had heeled to a large angle which decreased the height of the antenna and consequently considerably reduced the signal strength. Because of this, Coastguard stations did not hear the vessel's original distress call. However, the MAYDAY was heard briefly and faintly on board an oil rig in the area, and the Radio Officer on board managed to contact a local Coastguard station where the radio recording tapes were played back to enable the weak distress message to be listened to carefully, and then for the vessel's position to be relayed by radio.

Comment

1. **Merchant Shipping Notice No M.1657, "Hazards Associated with Trawling and the use of Lifting Equipment"**, amongst other valuable advice, points out that means should be available of releasing snagged gear in an emergency.

2. When an emergency occurs, it is vital that an early urgency and/or distress call is made in accordance with **Merchant Shipping Notices No's M.1646 "Radiotelephone Distress Procedure"** and **M.1632 "Proper Use of VHF Channels at Sea"**, and that the two-tone alarm is also activated.

7. FISHING VESSEL SINKS WITH LOSS OF TWO LIVES

Narrative

A 15 year old vessel equipped for single beam trawling, 7.74 metres long and of all steel construction, with a wheelhouse forward was partially decked aft over two compartments which were separated by a transverse bulkhead. Three hatches in the aft deck, fitted with hinged and gasketted covers gave access to these underdeck compartments. These compartments drained forward, into the open engine space, by way of small limber holes. The vessel's three bilge pumps were able to pump from the engine space only.

The owner, who had just bought the vessel, completed a large amount of work on her but, before he was able to employ her in any fishing activity, he chartered her out for duties as a work boat. The vessel's fishing gear, including her winch, was removed. All of the work on this charter was in river or estuary waters and was performed without incident; the vessel did not go to sea.

On completion of the charter the vessel was re-equipped with fishing gear as a single beamer. Over a period of several months approximately ten to twelve fishing trips were undertaken with a local man, who was not the owner, acting as Skipper. Commercially these trips were not very successful.

Another local man was then given the opportunity of taking over the vessel with a view to improving the size of her catches.

On the vessel's first trip with the new man in charge and another acting as crewman, three extra persons were also invited along for a morning's angling; thus making a total of five people on board. About an hour after leaving harbour on a bright warm summer's morning in calm sea conditions, the handling of the vessel became sluggish. A brief investigation quickly established that the stern compartments of the vessel were flooded. The vessel was then steered towards the shore with a view to beaching her.

However, shortly after making the turn and when about a mile from the shore, the vessel rolled heavily and sank rapidly by the stern, throwing all on board in to the sea. An effort by one of the men to broadcast a MAYDAY message was abruptly interrupted after only two or three words had been spoken. One lifebuoy from the vessel floated to the surface. All five men arranged themselves around this lifebuoy and began to swim for the shore. They continued swimming for about two hours until they were about 200 metres from the shore. At this point one of the men died and another slipped away from the group around the lifebuoy; his body was recovered later. The remaining threemen, although exhausted, scrambled ashore and raised the alarm.

Observations

1. During the period following her purchase the owner had increased the vessel's displacement by fitting a heavier fishing beam, an additional gantry, a heavier winch and a large area of doubling plates on the bottom of the hull.

2. Shortly after the vessel sank she was filmed underwater, then raised and towed into port. Tests were performed which demonstrated that the vessel's freeboard was very limited. It was concluded that lack of sufficient freeboard allowed water to pass onto the deck and then into the hull by way of the hatches which had not been secured closed.

3. The inspection also showed that the VHF radio was unlikely to have been in working order at the time of the sinking due to a defective aerial connection. This may explain why no MAYDAY was received by Coastguard or any other station.

4. When the vessel had left harbour no traffic had been heard on the VHF radio yet no attempt was made to check if the set was functioning correctly; the speaker crackle heard when the set was switched on was interpreted as an indication that the set was operational.

5. Being less than 12 metres in length this fishing vessel was not, at the time of the accident, required by regulation to carry an inflatable liferaft. However, life-jackets for all on board and at least two lifebuoys were required. Although one lifebuoy was used by the survivors no other lifebuoy or life-jackets were found when the vessel was recovered.

Comment

1. **Merchant Shipping Notice No M.1467** contains a recommendation that fishing vessels of less than 12 metres in length should carry a liferaft equipped with a hydrostatic release unit. Although operating the vessel close to shore, where many consider a liferaft to be either of little value or an expensive luxury, there can be little doubt that the availability of a properly inflated liferaft would have been of great assistance to these five men; and may have saved the lives of two.

2. The lack of weather-tight hatch covers is a feature commonly encountered on small fishing vessels. This vessel had been equipped with hatch covers which could be closed and secured weather-tight. It is unfortunate that these were not secured closed for this particular voyage.

3. The particular shortcoming of this vessel, which probably contributed most to its flooding and subsequent foundering, was her lack of sufficient freeboard. **Merchant Shipping Notice No M.975**, deals with the subject of freeboard on fishing vessels over 12 metres in length. Although not a requirement for smaller fishing vessels, the contents of this M Notice are an important guide to the significance of freeboard as a safety factor on any vessel. Most vessels experience an increase in their displacement during their lives due to modifications to the structure and extra equipment carried. This has a corresponding effect on draught and freeboard. An accurate periodic check on draught, in an easily reproducible condition of loading, is a sensible precaution.

8. FISHING VESSEL SINKS AT ANCHOR

Narrative

A 25 year old, 30.21 metre, steel built, shelter-decked purse seiner took shelter from bad weather in a west coast harbour. She was re-fuelled and took on freshwater. The crew left the vessel unmanned at a safe anchorage within the harbour. In compliance with the Harbour Master's standing instructions and in order to reduce windage the vessel was ballasted down by filling her refrigerated salt water tanks. Three days later the Coastguard were tasked to investigate an EPIRB alert within the harbour. It was found that the vessel had sunk at her anchorage.

Observations

1. The foundering was caused by back flooding through a drain well on the working deck inside the shelter.
2. The back flooding was due to two factors being present at the same time:
    - the working deck in the vicinity of the deck drain well was below the water line; and
    - the failure of the non-return valve in between the drain opening and the overboard discharge.
3. All interior doors and hatches had been left open to allow air to circulate; consequently the flooding of the vessel was unrestricted.
4. The crew had taken the precaution of closing all the side valves before leaving the vessel. However, they were unaware that the deck drain well discharged directly overboard and as a result this was left open.

Comment

1. The extreme ballasted draught of the vessel was in excess of the deepest approved draught for the vessel. Under no normal operational circumstances should this have been allowed to occur.
2. It is essential that the Skipper and crew are familiar with the disposition of all ship side valves, and that all non-return valves are maintained in good condition. **Merchant Shipping Notice No M.1327 "Losses of Fishing Vessels Through Flooding"** is informative in this respect.
3. Successive surveys of the vessel had failed to identify that the drain wells discharged directly overboard. Surveyors should examine carefully the drainage arrangements from working decks within a watertight shelter, particularly in the case where a vessel was not originally built with one.

9. BILGE PUMPING FAILURE CAUSES LOSS OF FISHING VESSEL

Narrative

A 20 year old stern trawler, of wooden construction and 21.32 metres length, was operated by a crew of four. The vessel left her home port and spent a few days fishing before making for another port in order to repair the auxiliary engine's general service (GS) pump. The vessel returned to sea the same day without completing the pump repair because no spare parts were available.

After further fishing and an extended period mending nets, the Skipper attempted to turn the vessel. He experienced difficulty due to the loss of power assistance to the steering gear. Having completed the turn, using hand steering, the Skipper inspected the engine-room where he found water had reached the level of the floor plates. This water was being thrown over electrical equipment by the main engine's power take off belts. The Skipper stopped the main engine because he was concerned about damage being caused to the electrical equipment.

The Coastguard was contacted and a portable pump was airlifted by helicopter to the vessel. Use of this pump did not significantly reduce the level of water in the engine-room, and a second pump was requested. However, deteriorating weather conditions prevented this pump from being lowered to the vessel. It was then discovered the fish hold was also flooding.

Despite being towed for several hours by another fishing vessel in an attempt to reach a port of refuge, the crew had to abandon ship and were winched off by helicopter shortly before the vessel sank.

Observations

1. This vessel was equipped with two ejector type bilge pumping systems; one supplied by the main engine's GS pump the other by the auxiliary engine's GS pump. With the auxiliary engine's GS pump out of service the vessel was left with no bilge pumping capacity once the main engine had been stopped shortly after the flooding was discovered.

2. The flooding was noticed only when another powered system on the vessel failed; the steering gear. The high level bilge alarm did not function and the engine-room had not been inspected or visited for some eight hours before the flooding was found.

3. Largely due to the difficulty of access and inspection because of the high water level in the engine-room at the time the flooding was discovered, investigation was difficult and no certain cause of the flooding could be found.

Comment

One very important safety device on a fishing vessel is the high level bilgealarm. Without testing this alarm on a regular basis it is impossible to ensure that it will function correctly in an emergency. To leave an engine-room completely unchecked for a period of eight hours, with machinery running and while the vessel is at sea, is poor operational practice which has the potential to cause serious problems, as this incident demonstrates.

10. CRUSH INJURY TO FISHERMAN WHILST OPERATING WINCH

Narrative

A fishing vessel had been on the slip for repairs during which time various items of fishing gear had been stowed in the fish hold for security reasons. Once repairs were completed the vessel re-entered the water and prepared to go to sea. In order to lift the fishing equipment back on deck a single rope runner was used with turns on a continuously rotating winch drum. The operator set the winch to run at slow speed and added or removed rope turns on the drum as required. The winch controls were sited in the wheelhouse with an emergency stop adjacent to the winch.

One of the crew was in the fish hold attaching equipment to the runner hook whilst another crewman was on deck controlling the rope turns on the winch drum. A coil of rope had just been hooked up and the crewman on deck had added a couple of turns of rope to the winch drum to start hoisting. As the crewman was applying the rope turns, his jacket was caught between the rope and the drum. Although he tried to pull it free, it remained trapped and he was dragged onto the winch. Such was the speed and position in which he found himself, he was unable to reach the emergency stop lever. Fortunately for him, his shouts attracted the attention of another crewman who was in the wheelhouse. He stopped the winch but not before the crewman had been rotated round the winchdrum, suffering injuries to his chest and upper body as a result.

Observations

The siting of winch controls in the wheelhouse with a local emergency stop at the winch itself is a common design feature on many vessels. Similarly, the practice of setting the winch controls to allow a winch drum to run continuously at slow speed whilst using a single rope runner is also widely used in the fishing industry. Unfortunately this practice has also resulted in the wheelhouse and moving machinery controls being left unattended and total reliance placed on the operator being able to use the emergency stop if anything goes wrong.

Comment

1. It was fortunate that in this case, a crew member had occasion to enter the wheelhouse on another matter just as the injured man became caught. Shouts from other men on deck alerted him and resulted in the winch being stopped, unfortunately not before the injured man had been rotated round the winch drum.

2. This incident illustrates the need for all fishermen to take note of the advice given in the **DOT Booklet "Fishermen and Safety"**, in **Merchant Shipping Notice No M.1561** and in particular, **"Code of Safe Working Practices for Merchant Seamen" Chapter 17, Section 17.2.18** - "A powered appliance should always have a person at the controls while it is in operation; it should never be left to run with a control secured in the ON position."

11. POOR BILGE PUMPING PRACTICES CAUSE ACCIDENTS

Narrative

MAIB investigations into the flooding of fishing vessels have identified operational procedures relating to bilge pumping systems, which can cause problems for Skippers and crew. Many of these incidents have resulted in the vessel foundering.

The first area of concern is the practice of continuously pumping engine-room bilges.

Initial consideration might well suggest that this is a trouble-free way of keeping the engine-room 'dry'. However, with an 'ejector' type of main bilgepump, the capacity of the system will have been exceeded by the time the waterlevel activates the high level bilge alarm. At that stage there may be no sparepowered bilge pumping capacity available to lower the level of floodwater. If water is entering the vessel at a greater rate than the ejector can pump it out, floodwater rises and unless the cause of flooding can be stopped, the vessel maybe lost.

The second point concerns centrifugal bilge pumps, ie many non ejector systems, and the practice of keeping the pump's sea inlet valve open when pumping bilges.

This practice has the perceived merit of preventing the bilge pump from running 'dry', and allowing the crewman supposedly supervising the operation to undertake other work. In many cases there is no supervision at all and bilges are left to pump continuously, as with the ejector type system.

While the pump is running, the overboard discharge is often checked and, if a steady discharge of water is seen, it is assumed that bilges are being pumped. Unfortunately in many cases this has given a false indication of the system's performance, as the water which has been seen discharging has been mainly seawater drawn and very little, if any, has been bilge water. Again, this has often resulted in the bilge water level continuing to rise, leading to the vessel being lost.

To ensure that this type of system pumps bilges at the maximum rate possible, which is essential in a flooding emergency, it is necessary for the pump's sea suction to be closed and the bilge suction to be fully open. All water which is then seen to be discharging overboard from the system will be bilge water.

Observations

1. Another consequence of the continuous bilge pumping practice is the possibility that crew consider routine visits to the engine-room to be unnecessary; this in turn means that flooding may then go undetected until it is too late.

2. Further, in normal circumstances if the bilge water never rises to a level where the bilge alarm operates, this alarm, if it has not been tested regularly, may fall into disuse and may then not function in the event of an emergency.

Comment

It is recognised that, particularly on smaller fishing vessels, there are many power driven pumps used for bilge and deck wash duties, which employ a flexible rotating element as a major component. This type of pump does, when running, require a continuous flow of water through it in order to lubricate and cool this flexible rotor; failure may otherwise occur. When pumping bilges with this type of pump the operation must be monitored so that the pump's suction can again be opened to the sea and the bilge suction closed once the bilges are dry.

12. FISHING VESSEL CAPSIZES IN HARBOUR

Narrative

A newly-built steel twin beam trawler of 11.98 metres length was lying starboardside alongside a dock wall. The crew were changing the cod ends on her trawlgear. The trawl gear on the starboard side was suspended from the top of the derrick which was almost vertical.

The Skipper began to haul the port beam gear to the top of the port derrick, which again was almost vertical. As the chain mat cleared the port bulwark rail the vessel heeled to port and capsized. All three members of the crew managed to scramble to safety. None were seriously injured.

The vessel was recovered later and her stability assessed.

Observations

1. The capsize was recorded on a nearby security camera. A sequence of photographs covering the 21 seconds of interest is shown here.
2. It took just 11 seconds from the point at which capsize became unavoidable for the vessel to be laid completely on her side.
3. The vessel turned completely upside down shortly afterwards, trapping the EPIRB and liferaft inside the bulwarks.
4. Having just completed a fishing trip and landed her catch, the vessel was low on fuel and fresh water.
5. She had been in service a little over two months when the accident occurred.

Comment

1. It is common practice on small beam trawlers, when alongside in port, to haul up both sets of gear for inspection and repair.

2. The fundamental cause of the accident was a dangerously low level of transverse stability.

3. The stability of the vessel had been calculated after she was first launched. Following the accident, MAIB found it to be significantly less than the minimum standard recommended by the Marine Safety Agency for under 12 metre fishing vessels. Nevertheless, because the MSA minimum standard is a recommendation and not a regulation, the vessel was put into service without modification. However, despite the lack of specific regulations covering the stability of under 12 metre fishing vessels, owners should be aware that they still have an obligation in law to **ensure the seaworthiness of their vessels**.

4. The stability of the vessel was further reduced before she entered service by the addition of more gear. After she had entered service the derricks were lengthened and strengthened, lessening the stability of the vessel still further. It is essential, particularly on small fishing vessels, that alterations should not be made to the structure or fishing gear without checking that the standard of stability and seaworthiness is not thereby reduced.

5. **Merchant Shipping Notice No M.989 "The Safety of Small Fishing Vessels"** is well worth reading in the context of this accident.

13. SUBMARINE SNAGGED WARPS OF PAIR TRAWLERS

Narrative

A diesel powered submarine became snagged on the warps of pair trawlers. The submarine subsequently came to the surface and the warps, which were lying across the pressure hull, were manhandled clear by the submarine crew. Nobody was injured in the incident and only minor damage was caused to the fishing vessels and their gear. The weather conditions were calm and sunny.

At the time of the incident, the NATO submarine was exercising with Royal Naval aircraft and surface ships in a designated submarine exercise area in the western English Channel. For over two hours prior to the snagging the submarine had been manoeuvring to avoid detection by the other participants in the exercise, while at the same time seeking out and "attacking" designated targets. She had been operating at below periscope depth for most of this time.

The pair trawlers had been towing a bottom trawl in an east-south-easterly direction since before the naval exercise started. Although they were aware of the naval activity they were unaware that a submarine was in their immediate vicinity until the snagging happened.

Observations

1. "The Code of Practice for the Conduct of Submarine Operations in the Vicinity of Fishing Vessels" was applicable. This Code was agreed between the Royal Navy and the Marine Safety Agency after consultations with the fishing industry, following a fatal snagging incident involving a fishing vessel in 1990, and covers all Royal Navy and allied submarine activity in UK territorial waters and exercise areas. The Code puts the onus on submarine commanders to maintain a mandatory separation from all fishing vessels of at least 1372 metres (1500 yards) when at periscope depth and 3659 metres (4000 yards) when deep.

2. As is the standard practice for exercises involving surface ships and submarines, one of the Royal Naval surface ships had been designated Fishing Vessel Safety Ship (FVSS) for the exercise. The role of the FVSS (a requirement of the Code) is to provide assistance to the participating submarine to compile its plot of fishing vessel activity in order to minimise the risk of interaction; to make fishing vessels aware of submarine exercise activity in their vicinity, and to provide a source of information in order to minimise the risk of interaction.

3. Partly due to the calm conditions, the submarine was quite easily detected and its track monitored by the Royal Naval aircraft and surface ships. The developing close quarters situation was observed by the FVSS and contact with the submarine was established. Additionally, attempts were made to contact the pair trawlers by VHF and visual signalling.

4. Prior to the commencement of the exercise a SUBFACTS broadcast had been made to warn fishing vessels where submarine exercise activity was taking place that day. This is also in the provisions of the code.

Comment

1. Although the Submarine Commander had been briefed on the Code of Practice he did not place enough priority on its requirements and the mandatory separation distances were not maintained.

2. Not all of the safety communications between the FVSS and submarine were correctly applied or fully received. Some were therefore misleading.

3. The Skippers of the fishing vessels had not listened to the SUBFACTS broadcast.

4. In general, the crews of the fishing vessels showed a casual attitude to the attempts by the FVSS to contact them on VHF channel 16 prior to the snagging. Neither were they keeping an efficient visual lookout.

5. A new Merchant Shipping Notice will be published to inform fishermen of the capabilities of submarine sonar detection and recommendations for action to be taken when operating within submarine exercise areas. Since the incident, the Royal Navy has implemented a number of improvements to the procedures governing British and allied submarine activity to minimise the possibility of a similar incident happening again.

14. CAPSIZE OF OPEN FISHING BOAT IN ADVERSE WEATHER

Narrative

A six metre GRP open fishing boat, with two persons on board, proceeded to fishing grounds located close inshore but exposed to the prevailing weather conditions. On arrival, the crew intended to move three fleets of pots to amore sheltered position.

The wind freshened during the day and the vessel was reported overdue to HM Coastguard, who then initiated an extensive land, air and sea search.

The upturned hull of the vessel was subsequently found and recovered. However, the two crew were lost.

Observations

1. The vessel was based upon a standard design. However, a number of modifications were made during construction and later by subsequent owners.
2. The vessel was seven years old and had only recently been acquired by her current owner.
3. Following the accident, the hull was found to be intact and in good condition both internally and externally.
4. The vessel was last seen heading into a Force 6 wind which was forecast to increase to a Force 8 for the area concerned.
5. A tangled bundle of two fleets of pots was subsequently found in close proximity to the fishing grounds.
6. Neither of the two men were wearing life-jackets or buoyancy aids. There were no lifebuoys or distress flares on board.
7. No liferaft, EPIRB (Emergency Position-Indicating Radio Beacon) or VHF radio was carried.

Comment

1. It is probable that the vessel had loaded two fleets of pots on deck and then capsized due to the combined effect of the prevailing weather conditions and the reduced stability of the vessel at that time.

2. Due to modifications to the vessel during and subsequent to her construction, it is probable that the stability, reserve of buoyancy and freeboard were inferior to that of a vessel built to the standard design.

3. It is probable that the crew over-estimated the stability and sea-keeping capability of the vessel in the prevailing circumstances.

4. It is possible that one or both lives might have been saved:

    - if each of the crew had been wearing a life-jacket or buoyancy aid at the time of capsize;
    - if an inflatable liferaft had been available for use as an out of water means of support; and
    - if it had been possible to alert the emergency services to the accident without delay.

15. FATALITY DURING LIFEBOAT RELEASE GEAR TEST

Narrative

The on-load release gear fitted to the enclosed lifeboats of an offshore oil platform was to be inspected and tested. This release gear was of a type fitted to the lifeboats of many ships.

As standard equipment, two safety or maintenance pendants were fitted to the lifeboat's support structure. These were intended to be used for supporting the lifeboat's weight while hooks, release gear etc were undergoing maintenance. A lug was built into each hook's mounting assembly, secured to the lifeboat's structure, to which the lower end of each maintenance pendant could be shackled when required.

Two of the platform's technicians had completed the task of inspecting and checking two lifeboats. Before they started work on the third lifeboat, one of the two technicians was required elsewhere on the platform; he was replaced by another person having a non-technical role on the platform and who was unfamiliar with the task in hand.

These two men then continued their work on the third lifeboat. From within this lifeboat each man secured one of the two maintenance pendants. One man then climbed from the lifeboat, leaving the technician in the lifeboat to operate there lease lever.

Immediately the technician operated the release gear lever both hooks released as intended but the forward end of the lifeboat fell away. The lifeboat then dropped about 20 metres into the sea after tearing the aft hook column out of the lifeboat's structure. On recovery of the lifeboat, the technician was found to be dead.

Observations

This type of on-load release gear was equipped with a hydrostatic interlock which was designed to prevent release of the hooks before the lifeboat entered the water. This interlock had to be disabled to perform the required test.

Comment

1. The forward maintenance pendant had not been secured to the lug on the forward hook's mounting assembly but, erroneously, to the lifting ring on the lower fall block. When the forward hook opened, the bow of the lifeboat fell away.
2. The technician, who unfortunately lost his life, left an inexperienced colleague to secure the forward maintenance pendant. He then proceeded to operate the hook's release gear before checking the work of his colleague.
3. The test procedures set out in **Merchant Shipping Notice M.1248** clearly provides for the lifeboat under test to be lowered into the water where the hooks are to be released. This notice specifically warns against testing this equipment while the lifeboat is hanging in the davits.

16. OVERTURNING OF CRAWLER CRANE

Narrative

A UK registered dry cargo barge had been contracted to load and carry limestone rock from a quarry to a port in the south west of England. It was to be unloaded between high and low water marks so that a shore contractor could retrieve the rock at low water for sea defence works. Although the preferred method of rock handling was by dump truck and bulldozer, the lack of a loading ramp at the quarry resulted in the purchase of a diesel powered crawler crane. This crawler crane was used for both loading and discharge.

The crawler crane was fitted with a grapple lifting device, and the initial cargoof limestone was loaded aboard and the barge towed to the unloading port. The weather on arrival was good although there was a slight swell. Once the barge was in place, discharge started and continued without any problem until about50% had been discharged.

At about this time, the crane driver selected a piece of limestone rock, estimated to weigh between 3.5 and 4.0 tonne. As the rock was lifted and came free, it swung away from the jib, effectively increasing the lift radius and overloading the crane. To counter the overloading and overturning moment, the crane driver started to luff-up or raise the jib. At that moment, the barge moved under the influence of the sea swell rapidly adding to the overturning moment. With the situation becoming critical, the driver tried to drop the rock back on to the deck. Unfortunately the foot brake jammed, preventing him from releasing the load. He considered releasing the brakes by hand but realised that the sudden uncontrolled release would cause the counter weight to pull the jiband grapple rapidly back, leading to possible damage to the driver's cab itself. With the crane now unbalanced and on the verge of toppling, the driver jumped out of the cab. In doing so he broke his left arm. The crane toppled over and ended up with the jib resting over the side, slightly crushing the hand rail.

Observations

1. Although the crane was chained down during the transit voyage, it was not chained down whilst working. It was considered that to secure the crane whilst working would not only prevent the operator sensing any degree of unbalance but also restrict his ability to manoeuvre the crane. Auto-indication of overloading is mandatory but rectification lies in the hands of the crane driver.

2. The use of a crawler crane for the cargo operation was brought about by the lack of an alternative loading arrangement during the initial stages of the contract. The incident itself was brought about by a combination of the failure of the crane braking system and the rolling effect of the sea swell.

Comment

1. The Merchant Shipping (Hatches and Lifting Plant) Regulations 1988, SI No 1639, require that the employer (and Master, although in this case the barge did not have one) shall ensure that no lifting plant is used unless it has been thoroughly examined by a competent person within the preceding 12 month period. In this case, the employer - the crane driver - was provided with a certificate stating that the crane had been thoroughly inspected in June, some two months earlier.

2. The cause of the brake failure was not immediately apparent but as the mobile crawler crane had been sold with a current examination certificate, the Health and Safety Executive (HSE) were to pursue the matter under their Regulations.