Marine Accident Investigation Branch (MAIB) - Safety Digest 03/1995

Contents

1. SHIFT OF CARGO ON BOARD A RO-RO FERRY DUE TO HEAVY WEATHER

Narrative

Before leaving a port in the Republic of Ireland for her home port in Wales, the Master of a 7,836 gross registered tonnage Ro-Ro ferry issued instructions that, because of forecasted winds of force 8 - 9, extra lashings should be secured to all commercial vehicles. Private vehicles were block stowed in the fore and aft extremities of the vehicle deck but usual practice was not to lash them.

The ferry departed at about 2310 hrs with 278 passengers, 33 cars, 14accompanied trailers, 4 unaccompanied trailers and 1 caravan. At first the passage was comparatively smooth due to the lee of the land. By midnight the wind had increased to force 8 from the southwest with a heavy confused swell - predominantly from the south. At about 0045 hrs there were reports that, due to the ferry's movement, damage was being caused in the restaurant and in the duty free shop. However, the movement of the ship was not severe enough to cause concern about the safety of the passengers, as the ship had decreased speed and the stabilisers were in operation. By about 0110 hrs the wind had increased to force 9 - 10 and she was steering a course of070º(T).

At about 0125 hrs she took a sudden shear and roll to starboard and then rolled very quickly and very heavily to port. The ferry soon recovered and the Master altered course to 055º(T) placing the seas further on the quarter. The ship continued on passage without further incident and berthed at about 0430 hrs.

It was found that all the private vehicles had moved across the vehicle deck and were damaged. Some of the commercial vehicles had moved but because of their lashings, the movement had been restricted and damage was comparatively minor. The only damage caused to the ship herself was a broken window which was hit by a heavy table. Fourteen passengers and six crew members suffered injuries but none of them serious.

Observations

1. The ferry was struck by an abnormal wave which was higher and steeper than the height of waves expected for the force of wind experienced that night.
2. A great deal of the stores and furnishings - including numerous individual seats and seat units, counter units and shop display stands -shifted in the incident as they were not secured against the movement of the ship.
3. None of the lashings to the commercial vehicles failed in the incident.
4. The legs of the trailers had been lowered to the deck.

Comment

1. The ferry company has ensured that all items of heavy furniture have been fastened down on board this particular ferry. Also, displays in the duty free shop will be taken down or secured in the advent of heavy weather.

2. The lowering of the trailer legs was in addition to the recommendations made in Section 5 of the Code of Practice "Roll-on/Roll-off Ships - Stowage and Securing of Vehicles".

2. NEAR MISS NEAR TERMINATION OF TRAFFIC SEPARATION SCHEME

Narrative

A passenger ship was being overtaken by a reefer ship near the termination of the eastbound lane of a Traffic Separation Scheme. When the vessels reached the end of the lane they were on almost parallel easterly courses, with the reefer ship about a mile from the passenger ship and on her portquarter. It was daytime with good weather and clear visibility.

After clearing the lane the reefer ship intended to maintain her easterly course. The passenger ship, however, was bound for a different port and intended to turn to a north easterly course. The passenger ship contacted the reefer ship by VHF radio and advised her that she was going to start to come to port and would pass around the stern of the reefer ship. The reefer ship acknowledged this and confirmed that she would maintain her own course.

The passenger ship started a slow turn to port to a course of 060º, using the auto-pilot controls. These controls included a facility for pre-setting the radius of turn before selecting the new course. A turn radius of 8cables was selected. The passenger ship remained on the 060º course for one minute after which another turn to port was initiated, again with the turn radius set at 8 cables. This second turn was not set to leave the auto-pilot to make the manoeuvre; instead the course selector was adjusted a little at a time, to allow the ship's heading to follow it slowly to port. Four minutes after the initiation of the first turn, the passenger ship had reached a heading of 037º. The reefer ship was just forward of her port beam bearing 305º true at a range of 3.9 cables. After about another minute the passenger ship had reached 021º and the reefer ship was 17º forward of her port beam, bearing 308º at a range of 2.1 cables.

The Officer of the Watch on the passenger ship realised that his manoeuvre was not going to plan and reduced the ahead power of the engines by the bridge controls. A collision was only narrowly avoided as the reefer ship passed ahead of the passenger ship at very close range.

Observations

1. The passenger ship was fitted with a data recorder. This showed that as the auto-pilot course selector was being manually adjusted to turn the vessel to port, the rate of turn never exceeded 15º per minute, thereby significantly increasing the radius of the turn beyond the 8 cables originally selected. This effectively put the vessel on a collision track with the reefer ship.

2. The ARPA (Automatic Radar Plotting Aid) on the passenger ship was set to the six miles range. This range and the relatively close range of the reefer ship would not have allowed direct monitoring of its relative motion.

Comment

1. Even if the pre-set turning radius of eight cables had been maintained throughout the turn, the manoeuvre carried out by the passenger ship would still have been dangerous and in contravention of the International Regulations for Preventing Collisions at Sea.

2. Rule 17 of the Regulations required the passenger ship to maintain her course and speed. She should have delayed the start of her turn to port until the reefer ship had drawn safely ahead.

3. Alternatively, there might have been good reasons for the passenger ship to have preferred to alter course at the pre-planned alter course position, rather than 'overshoot' it; for example, to avoid risk of collision with a third vessel. Under these or similar circumstances it would have been acceptable under Rule 2 for the passenger ship to have made a substantial reduction in speed before reaching her alter course position, allowing the overtaking ship to draw ahead at an earlier stage.

3. LOSS OF A SMALL CARGO VESSEL

Narrative

An 850 gross registered tonnage, single hold dry cargo vessel with a crew offive was employed on regular voyages carrying coal. A full cargo was loaded and trimmed to within 30cm of the hatch covers over the full length of the hold except for the forward 4 - 5 metres.

After departure, the vessel experienced several days of poor weather conditions with wind force 7 - 8 increasing to force 8 - 10 causing seas to break over the hatch covers. Towards the end of the Mate's watch, at 0400hrs, a port list of 4º to 5º was noticed. The Chief Engineer was requested to discharge ballast from the port ballast tank to correct this list. These efforts proved successful, however after a very short period the vessel again started to list to port. On this occasion the list gradually increased until it was estimated to be 40º - 50º. Attempts to correct the list by transferring ballast failed.

The Master broadcast a MAYDAY and the crew abandoned the vessel. Three men managed to board a liferaft and were later recovered. The other two were lost. The vessel capsized shortly afterwards.

Observations

1. No clear cause could be established for the capsizing of the vessel. However a shift and liquefaction of the coal cargo must be considered as a possible explanation.

2. The two men who lost their lives had donned survival suits but neither man was able to properly close the zips due to the suits not being large enough.

Comment

1. Advice on the recommended precautions to be taken when loading coal cargoes is contained in Merchant Shipping Notice No M.1250.

2. It is speculation to suggest that the two men who lost their lives might have been saved if their survival suits had fitted properly. However, these suits would have been of very limited value in the unzipped state.

4. CAPSIZE OF TUGS

Narrative

Several investigations have been undertaken into incidents where tugs have capsized while manoeuvring in the immediate vicinity of the vessels they were assisting.

In two of these incidents the tugs were close to the stern of the larger vessels and, due to restrictions of space in the dock and lock area, were using a comparatively short line.

In one case a tug was passing across the stern of the larger vessel, whose engine was still on slow ahead to arrest astern movement, when it came into the influence of the propeller's wash. The intensity of this wash moved the tug athwart ships and removed the slack from the towing line which was secured to the towing hook of the tug, amidships. Once the line became taut the tug started to heel sharply, quickly reaching an angle of 90º. On removal of weight from the line, the tug regained an almost upright condition with minimal flooding.

In the other incident the weight in the tug's line was effectively taken at the stern using a gog line (a length of rope used to bowse in the tow rope, sometimes called a gob rope). The vessel being assisted was passing through a narrow dock entrance, causing the tug to be positioned almost directly astern, and was using significant engine power due to there being a highwind. No difficulty was experienced until the tug's gog lined failed, so transferring the line's load to the towing hook amidships. This turned the tug beam on and caused it to heel over. The tug quickly sank, albeit in shallow water.

Observations

1. It is of great good fortune that there was no loss of life in either incident.
2. In the first case, all possible openings in the tug had been secured closed. The benefit of this practice being clearly demonstrated by the limited flooding which occurred. The value of this practice is further emphasised by the other case where the tug sank due to flooding via unsecured openings.
3. The dangers of the larger vessel moving too quickly while a tug is beam on to its towline is well recognised by tug Skippers. However, the potential effects of being caught in a propeller's wash may sometimes be overlooked.

Comment

Useful advice on the safety of tugs while towing is contained in Merchant Shipping Notice No M.1531.

5. INCIDENT INVOLVING THE RESCUE OF THREE MEN FROM A CARGO TANK

Narrative

A 5,800 dwt tanker was on passage to a loading port for a cargo of kerosene; the previous cargo had been naphtha. Cargo preparation required waterflushing of the tanks followed by gas-freeing and entry to hand mop the tankbottoms. The tanker had ten cargo tanks arranged in pairs, numbered 1 - 5from forward, with a centre line bulkhead and a single slop tank aft. The tanks were loaded through individual drop lines and each had its own deepwell pump.

The tanks were flushed by pumping water into No 1 tank then pumping this to No 2 tank and so on down the line of tanks and finally into the slop tank. All pipelines and manifolds were purged back to the slop tank using a purge-air system. Tanks were gas-freed by attaching two water driven fans, one port and one starboard, to the manifold and delivering air through the cargo loading lines. Numbers 1 and 2 port tanks were gas-freed first, exhausting to atmosphere through the tank lids. As they became gas-free other tanks were opened on the port side whilst continuing to vent the gas-free tanks.

Once the first tank was gas-free (Lower Flammable Limit (LFL) of less than1% and oxygen content 21%) a Tank Entry Permit was issued and the required safety equipment assembled near the tank opening. One man was in continual attendance on deck and he maintained communications with the Officer on bridge watch. Mopping of the tank bottoms progressed as tanks were tested and passed fit for entry.

All was proceeding well, with tank Nos 1 - 4 on the port side having been entered and mopped. At No 5 port tank the Chief Officer tested the atmosphere and obtained readings of 21% oxygen and a gas reading of less than 1%. He and a seaman entered the tank to educt residue from the pump well and they were joined by another seaman a short while later. It was about ten minutes after the third man entered the tank that one of the seamen noticed that the Chief Officer was in trouble and he raised the alarm with the man at the tank opening. The Bridge Officer was immediately informed, the alarm sounded and further assistance arrived on deck.

The three men in the tank were seen to be moving around and a rescuer entered the tank wearing breathing apparatus and assisted the Chief Officer and one seaman out of the tank. The third man was more affected by the gas and so a second rescuer in breathing apparatus entered the tank and managed to get him out successfully.

Once in the fresh air all three men recovered from the effects of hydrocarbon gas though the most seriously affected man suffered some discomfort for a short period afterwards.

Observations

1. The International Safety Guide for Oil Tankers and Terminals (ISGOTT)Chapter 15, states that after the carriage of naphthas, gasolines, gasoline blending products or special boiling point solvents, benzene or other aromatic hydrocarbons may be present. Overexposure to these can have chronic effects which may lead to blood and bone disorders. The Threshold Limit Value (TLV) for benzene is 10 ppm and it is recommended that special chemical tests are carried out to check for the presence of this substance. The approved Tanker Safety Courses also recommend that product tanks are tested for oxygen, LFL and benzene.

2. The accuracy of gas monitors varies between 0 and 3% provided the equipment is measuring the same gas as that with which it was calibrated. In the case of naphtha this represents a range of between 0 and 420 ppm against a 1% LFL reading. The TLV of naphtha is 300 ppm.

3. Although the Code of Safe Working Practices for Merchant Seamen (COSWP)states that a limit of 1% LFL is acceptable for entry, it also states that it would be safer to use a zero LFL.

Comment

1. The primary cause of the incident was the misreading of the gas monitoring equipment. The monitor had two modes, one measured oxygen and percentage gas whilst the other mode showed percentage gas and percentage Lower Flammable Limit. In this case the oxygen content and percentage gasmode was read. Consequently, though a reading of less than 1% was obtained, this represented a much higher gas content than 1% of the LFL.

2. In view of the possibility that a 1% LFL gas monitor reading can represent a gas concentration in excess of the TLV of naphtha, only a zero LFL should be accepted for entry.

3. The gas concentration came about because of the methods used to clean the tanks and gas-free them. The cascading method concentrated the residue into the after tanks and the efficiency of the gas freeing diminished as more tanks were opened. It is possible that the Chief Officer's judgement was impaired by the accumulated effects of the gas from the cleaning operation.

4. This case does illustrate how a successful rescue was possible because the basic safety requirements of the Code of Safe Working Practice were followed. The crew are to be commended for their action.

6. UNCONTROLLED FLOODING OF A CARGO VESSEL

Narrative

A modern, fully loaded, single hold cargo vessel of 1,409 gross registered tonnage was approaching port in poor weather conditions. The vessel was not flagged in the UK and was allowed to operate by its Administration with no dedicated Engineer on board. The main engine power was 749kW.

While the Master was on watch the machinery space alarm sounded. The Master left the bridge to inspect the engine-room where he discovered flooding. The floodwater was rising rapidly and before the Master was able to close the sea water inlets the main engine stopped and the space had to be evacuated. Flooding continued until a stable condition was achieved at which stage the vessel's main after deck was awash.

Fortunately, assistance was quickly on the scene and the crew were evacuated. The vessel was towed to a port where an inspection established that a strongback on a sea water strainer had fractured so allowing the strainer cover to be displaced.

Observations

1. This vessel was almost new at the time of the incident and was clearly maintained to a very high standard.

2. All the sea water inlet valves, and their associated strainer boxes, were sited below the lower floor plates within the engine-room. Access to these valves in the emergency proved to be difficult.

Comment

1. Had this vessel been equipped with extended spindles, or other devices, allowing the sea water inlet valves to be closed from above the flood waterlevel the ingress of water could have been arrested at an early stage.

2. The value of such remote closing systems, and the importance of maintaining them in good working order is clearly demonstrated by this incident.

3. There is a requirement in the SOLAS Convention, Regulation 48(3),regarding the location of the controls of any valve serving a sea inlet.

7. CHEMICAL TANKER STRANDS WITH A PILOT ON BOARD

Narrative

A 3,232 dwt chemical tanker was inward bound towards an estuary port. Pilotage in the estuary was compulsory and a licensed pilot boarded the vessel east of the designated boarding station. It was a mainly clear night with a westerly wind and moderate sea. When the Pilot arrived on the bridge the tanker was heading in an easterly direction, two radars were operational, the auto-pilot was engaged and the engine was working up to seaspeed. The Master went below soon after the Pilot took the con, leaving the First Officer on the bridge.

The usual course from the boarding station was 075º to bring an island in mid-estuary ahead. There was navigable water to the north and to the south of this island. Passing to the north would give a shorter passage, although there was less water and less sea room. It was the Pilot's intention to steer for the light on the island until a light on the northshore of the estuary was abeam, when course would be altered to 055º to pass four cables north of the island.

As the vessel approached the alter course position she entered a squall, visibility was restricted and the wind veered to a northerly quadrant and increased in strength. Rain clutter affected the radar and sea returns increased, severely degrading the close range display. The Pilot, probably anticipating that the squall would soon pass, did not adjust the radarcontrols to compensate for these effects.

During a gap in the rain the light on the north side of the estuary was seen near the beam and the Pilot altered to the new course, using the auto-pilot. On reaching the 055º heading the vessel was still in the squall, and the radar which the Pilot was observing was still virtually unusable because of the rain clutter. A few minutes later the light on the island was seen nearly abeam to starboard, but at very close range. The vessel grounded shortly afterwards.

Observations

1. The tanker was in ballast and fortunately there was no pollution. She was successfully refloated eleven hours later but with considerable bottom damage.

2. The Pilot had been on duty on the day before the incident. After less then two hours sleep at home he had been called and invited to pilot the chemical tanker. He then drove his car 65 miles and was probably fatigued when he boarded the ship at about 0340 hrs.

3. The Pilot had safely conducted several vessels on previous inbound passages, following the same passage plan. However on this occasion the Master had not been entirely happy to pass north of the island, although he accepted the Pilot's assurance that there was enough water there.

4. The Pilot received no depth reports from the First Officer, neither did he know if the echo sounder was running. No fixes were plotted on the chart prior to the stranding and the First Officer appeared to be leaving the navigation of the vessel entirely to the Pilot, who did not ask for assistance.

5. The vessel was yawing up to 5ø either side of the course set on the auto-pilot. No helmsman was on the bridge.

Comment

1. The Pilot agreed to work at short notice at night after a long period without adequate rest.
2. Account was not taken of the leeway effect of the wind during the squallon this shallow draft vessel in ballast. This, together with the relatively slow rate of turn when altering course with the auto-pilot, put the ship to the south of the intended 075º and 055º tracks.
3. The progress of the vessel was not monitored by the First Officer, perhaps because the ship was a frequent visitor to the port. The ship should have been in manual steering, to leave the Pilot free to give his full attention to the navigation of the vessel, and the assistance of the First Officer should have been asked for and given. It is generally inadvisable to use an auto-pilot when a vessel is in restricted pilotage waters.
4. The appropriate radar controls should have been used immediately to suppress the clutter returns. Simple parallel indexing techniques could then have been employed to keep the vessel at a safe distance from the island. The echo sounder should have been in use.
5. Guidance on the planning and conduct of passages and the use of radar parallel indexing techniques is given in Merchant Shipping Notices Nos M.854and M.1158.

8. SHIFT AND PARTIAL LOSS OF A TIMBER DECK CARGO

Narrative

A single hold dry cargo vessel of 1,892 gross registered tonnage loaded a cargo of bundled timber; 1,460 tonnes in the hold and 560 tonnes on deck. This deck cargo was loaded only on the hatch covers and was secured by lashings in accordance with the vessel's lashing plan. The vessel was not a specialised a timber carrier.

While on passage the deck cargo lashings were checked regularly. However, during a period of poor weather and while the vessel was hove to during the hours of darkness, an unexpected beam sea struck the deck cargo. Several cargo lashings failed, most of the deck cargo shifted slightly and some of the timber bundles were lost overboard causing the vessel to list.

The list was quickly corrected by filling a ballast wing tank and the vessel safely completed her voyage without further incident.

Observations

1. Section A of Part II of The Merchant Shipping (Load Lines) (Deck Cargo)Regulations 1968 require that a system of lashings of adequate strength are employed to ensure, as far as is practicable, that there is no movement of cargo in the worst weather conditions which may normally be expected.

2. The deck cargo lashings of this vessel were not marked with their safe working loads (SWL), nor was there any documentation on the vessel covering their testing, making it difficult for the Master to assess the suitability of these lashings. However it is fair to say that there was no clear evidence to suggest that the lashings which failed were below the required standard.

3. Advice on the strength of lashings for timber deck cargoes is contained in the IMO publication, "The Code of Practice for Ships Carrying Timber as Deck Cargoes".

Comment

1. Data should be available to the Master which will allow him to assess the suitability of lashings.

2. Notwithstanding the above comments on the strength of lashings, in this particular incident it is considered that weather and sea induced forces were overwhelming and were the primary cause of the cargo shifting.

9. MAJOR DAMAGE TO A GENERAL CARGO VESSEL DUE TO FLOODING

Narrative

A fully laden, single hold, dry cargo vessel of about 960 tonnes dead weight with a crew of five was on passage. The vessel had encountered head seas and winds of force 7 - 8 during the first 36 hours of the voyage. In these rough conditions it was not immediately apparent that the vessel was gradually listing to port. When the Officer of the Watch realised that this was happening he called the Master to the bridge.

Water was found to be present in the hold. It soon became clear that the pumps were having no discernable effect and that the vessel's condition was quickly deteriorating. The Master sent out a PAN PAN to the Coastguard. Over the next few hours the flooding caused her to take up a list to port and trim by the head to such an extent that the forward half of the vessel was submerged. Weather conditions were winds west by north force 8 and sea state 5 with a considerable swell.

The crew, except for the Master, were evacuated by helicopter. He conned the vessel for about four hours on his own, and with the assistance of the Coastguard and local lifeboats, managed to beach the vessel.

When the vessel was inspected on the beach it was found that the hold, the bosun's store, generator room and chain locker were flooded to the tops of their access hatch coamings. The cargo had not shifted. The vessel wasre-floated two days later and towed to a nearby port where its cargo was unloaded and the hull inspected. When it had been determined that the hull was intact she was towed away for repair.

Observations

1. All the spaces affected had flooded through their respective hatchcovers. Inspection of the vessel on the beach showed that the pontoon hatch covers over the hold had moved slightly, thus opening up the crossjoints in places. The access hatch covers to the other flooded spaces, whilst still in place, had all lost some of their securing cleats.

2. Whether the lack of watertightness of the hatch closing arrangements was due to defective equipment or a lack of care and attention on the part of the crew could not be determined.

3. All the vessel's cargo was water contaminated and declared a total loss.

4. The vessel itself had suffered severe hogging damage. In order to repair this the vessel had to be cut in two to allow a new section to be inserted.

Comment

1. Flooding is a constant source of danger to the safe and efficient operation of any ship.

2. Records show that in recent years flooding on various occasions caused contamination of fuel, loss of electrical power, loss of engine power and damage to cargo. In addition, flooding has caused fluidisation of cargo, loss of buoyancy and loss of stability which in turn has caused serious listing sometimes leading to capsize and the total loss of the ship. Yet, as is often shown by subsequent investigation of the individual incidents and casualties, these dangers have not been appreciated, or they have been underestimated by those on board and therefore not always effectively guarded against.

3. Merchant Shipping Notice No M.1361 lists the operational procedures recommended by the Department of Transport to be followed in order to minimise the risk to crew, cargo and ship, of a dangerous flooding situation arising.

10. SPEEDBOAT TRAGEDY RESULTS IN LOSS OF FIVE LIVES

Narrative

A 5 metre GRP pleasure craft was being used by a group of six men for an evening trip across and around a large tidal inland waterway. The time of the year was winter. This trip started during the early afternoon and included several visits to restaurants and public houses on the shores of the waterway. The party commenced their journey home across the waterway, a distance of several miles, shortly before midnight. A few minutes after departure the craft capsized and sank.

The alarm was raised by one of the men using a portable telephone to contact his wife, who in turn contacted the Coastguard. Unfortunately before assistance could reach the men, five of them had drowned.

Observations

1. The craft was designed to carry a maximum of four persons.

2. The craft carried no life-jackets, flares, navigation lights, means of making sound signals, VHF radio or functional bilge pump.

3. A hole had been drilled in the hull of the craft, slightly above the normal waterline by a previous owner, in a mistaken attempt to ventilate the fuel tank space, but had not been properly blanked off. With the weight of the extra two persons on board this hole was depressed below water level so allowing water to gradually fill the boat. This ingress of water was unseen by the men due to the darkness.

Comment

At the Inquest held into the deaths of these men, HM Coroner very clearly highlighted the relationship between the alcohol which these men had consumed and their ill-judged decision to operate an overloaded, unseaworthy and ill-equipped craft during the hours of darkness.

11. BARGEMASTER DROWNS AFTER FALLING OVERBOARD

Narrative

An 88 metre crane barge was moored approximately 300 metres offshore. Her stern was pointing directly out to sea. Operations for the day had ceased. The sea was calm but with a swell of about 0.8 to 1.0 metres. The winds were westerly force 3.

At about 2215 hrs the Bargemaster and three deckhands went aft to tidy up the emergency towing wire. As the last of the three deckhands was leaving the area on completion of the work he heard a splash and then someone shouting for help. He immediately threw a life buoy overboard and shouted "man overboard". Using a torch they located the Bargemaster in the water. Another life buoy was thrown to him and he was seen to catch hold of it. Attempts were made to haul him back on board on the end of the life buoy and later on the end of a ladder but he was unable to maintain his grip and fell back into the water. The Coastguard were alerted and a lifeboat and helicopter were tasked.

Despite their best efforts the crew were unable to rescue the Bargemaster and ladders were lashed in place to permit two of them to descend to the water to keep his head up. Unfortunately, by this time he was unconscious. The rescue helicopter arrived on the scene and airlifted the casualty to hospital. Attempts to revive him were unsuccessful and it was determined that drowning was the cause of death.

Observations

1. The guard rails on the barge were inset from the deck edge by about 2.5metres across the stern. The Bargemaster was working outside the guard rails when the accident occurred.
2. The deck of the barge was some 4 metres above the water.
3. There was a recess in the stern deck outside the guard rails for the emergency anchor.
4. The deck lighting in this area was poor.
5. At the time of the accident the Bargemaster was not wearing a life-jacket, although he was required to wear one in the Site Safety Plan.
6. His 12 hour work shift began at 0700 hrs, and had been extended because of impending bad weather.
7. A rescue boat was not in attendance. The Site Safety Plan required that a rescue boat should be in attendance at all times.

Comment

1. It is believed that, because of the poor lighting and possibly because of a lack of concentration on his part due to tiredness, the Bargemaster tripped or mistakenly stepped over the side of the recess and fell into the water.
2. This accident revealed serious deficiencies in the management of safety practised by the barge operators.

3. Individuals have a responsibility to take reasonable care of their own health and safety and to observe the safety measures that may be in force on their vessel.

12. CONTACT WITH OVERHEAD POWER CABLES BY A HEAVY LIFT SHEERLEGS PONTOON

Narrative

A large self-propelled sheer legs pontoon had completed an engineering project on a river berth. The pontoon was capable of lifting weights of up to 2,400 tonnes. The sheerlegs were made up of the 'A' frame and a flying jib which gave a total length of 84.4 metres. The pontoon had to shift upriver to a lay-by berth in order to carry out decommissioning work on the sheerlegs and rigging before departing the river for sea.

A river Pilot boarded the pontoon on the morning of the accident and discussed the move with the Master. The Pilot asked the Master if he was happy to make the move with the sheerlegs in the raised position to which the Master replied that he was. The Pilot confirmed that the pontoon conformed with the port authority's "Safety Checks" which were then passed to the Port Control.

The move commenced with the assistance of a tug, which had accompanied the pontoon throughout the engineering project. The tug and tow moved out in to the river and headed upstream making a speed of about two knots, passing in full view of the Port Control station. Then the Pilot and Master saw a flash, which they initially thought was lightning. The tug contacted the pontoon and informed the Master that the top of the sheerlegs had come into contact with, and had severed, the lower set of two overhead power cables which had been suspended across the river between two pylons.

Each of the two cables carried 275,000 volts but, due to a safety feature, the power to the cables was cut 140 milli-seconds after contact was made with them. The top of the sheerlegs was inspected after the accident and slight scorch marks were found.

Observations

1. The Master did not correlate the height of the sheerlegs with the clearance height of the power cables, which was shown on the Admiralty Chart.

2. The Pilot made the erroneous assumption that the Master had made his calculations on the air draught and that the pontoon was able to pass safely beneath the cables.

3. The Pilot did not question the Master nor did he make a positive report on the air draught to the duty Harbour Master despite the "Safety Check" system.

4. The General Directions, which govern the navigation and control of vessels in the river, did not specifically require the reporting of an unusual air draught.

5. The Duty Officers in the Port Control station had a full view of the pontoon and the power cables during the move up river and yet no one questioned her ability to pass safely beneath them.

Comment

An important lesson to be learnt from this accident is that to make assumptions in any operation is dangerous. It is essential to carry out **positive reporting** no matter how obvious an element in the operation may seem to be.

13. LOSS OF STERN TRAWLER DUE TO SNAGGING AND DOWNFLOODING

Narrative

A 27 metre stern trawler was towing in good weather conditions during the hours of darkness. The Skipper was in the wheelhouse and the other crewmembers were all under the forward shelter processing the previous haul.

Shortly before midnight the vessel suddenly heeled to starboard, quickly reaching an angle of 45º. The crewmen under the shelter realised that the vessel was in difficulties and proceeded to launch a liferaft which was stowed on the shelter. The angle of heel continued to increase rapidly. The crewmen boarded the liferaft to be joined shortly afterwards by the Skipper. At this stage the vessel had an angle of heel exceeding 75º.

Contact was made with a sister vessel using a portable VHF and the survivors were quickly recovered. The vessel sank while the survivors awaited recovery.

Observations

1. The vessel's shelter and aft casing were both watertight structures; provided the weathertight doors therein were securely closed. Both of these structures were required to remain watertight in order that the vessel's standard of stability met the minimum required by regulation.

2. None of the crew can recall positively closing the aftermost door in the starboard side of the aft casing after the previous shooting operation. It was concluded that this doorway became a major downflooding point before even the initial heel angle of 45º had been reached. This heel was induced by the starboard side gear becoming fastened on an underwater obstruction.

Comment

As is common with many vessels of this type, warnings are included in the stability booklet setting out the importance of maintaining the watertight integrity of the hull and superstructure in order that the vessel's stability characteristics match those set out in the booklet. This case demonstrates the importance of this practice, especially when a fishing vessel is towing, even in good weather conditions.

14. FLOODING TO TWO FISHING VESSELS THROUGH THEIR BILGE SYSTEMS

Narrative

Two recent accidents highlight the importance of maintaining bilges which are free of rubbish/debris.

Case 1

The crewman of a 10 metre steel fishing vessel had just finished using the deckwash hose. He went to the engine-room to turn off the pump. On entering the engine-room he found flooding up to the deck plates. He changed the pump from deckwash to bilge pumping operation and left the engine-room to raise the alarm. Shortly afterwards the engine stopped, thus all power to the bilge pump was lost. It was fortunate that the lifeboat which was sent out to rescue the crew carried a portable pump, which was used to save the vessel.

Case 2

The Skipper of a 21 metre wooden fishing vessel became aware that his vessel felt "heavy" in the water. On investigation the crew found that the fish hold had flooded to a depth of about 2 metres. The engine driven pump was supplying the deckwash hose at the time. Immediately the pump was switched from the deckwash hose to the bilge system. However, the bilge suction soon became choked with debris and rendered the bilge pump ineffective. The vessel was saved by using a portable pump which was transferred from the lifeboat which went to her assistance.

Observations

1. When both these vessels were examined in port it was discovered that back flooding through the bilge suctions when the deckwash hose was in use had been the source of the water. In both vessels the bilge and deck wash systems shared the same pump and piping system. In Case 1, the gate valve isolating the bilge system when the deckwash hose was in use had not been closed. Isolation of the bilge system then depended only upon a non-return valve. This non-return valve had been jammed open by a small piece of wood which had been picked up by the bilge suction. In Case 2, the gate valve isolating the bilge system was thought to have been screwed down fully to the closed position. However, it was again found that a small piece of wood, picked up by the bilge line, had stuck in the valve preventing it from being fully closed. There was no non-return valve in this system.

2. Both vessels were fitted with watertight bulkheads which restricted the flooding to a single space.

3. Both vessels were fitted with bilge alarms. In both cases these failed to operate.

Comment

The safety issues are adequately covered by Merchant Shipping Notice NoM.1327 "Losses of Fishing Vessels Through Flooding".

15. FISHERMAN IS SERIOUSLY INJURED WHILE LOBSTER POTTING

Narrative

A 14 metre fishing vessel with a crew of three was hauling lobster pots in calm conditions. Initially, one of the deckhands was operating the hauler, the other one was lifting the pots inboard and the Skipper was at the helm. When the last pot had been lifted, and only the grapnel anchor and dan buoy were left to bring on board, the Skipper took over the operation of the linehauler. One deckhand went aft to empty and re-bait the pots, the other waited to lift the grapnel anchor in board. When the grapnel anchor emerged from the water it did not stop to allow for the deckhand to lift it inboard. He turned to the Skipper to see what was going on and saw the grapnel anchor come down on the Skipper's head, knocking him unconscious. The Skipper was airlifted to hospital. His injuries were serious and permanent. He was unable to continue his fishing career.

Observations

1. The Skipper could remember nothing of the accident. It is believed that he intended to stop the hauler so that the grapnel anchor could be lifted inboard by allowing the line to "surge" on the rotating sheave of the linehauler, instead of stopping the hauler at the controls. It was the usual practice on this vessel to allow the line to "surge" in this way. (Note -this is an extremely dangerous practice). However, the line was pulled out of his hands on a riding turn and the grapnel anchor came over the top of the hauler and down onto his head.

2. The Skipper had many years experience in twin beam trawling but he had only undertaken three potting trips prior to the accident.

3. The grapnel anchor was tied to a line just 150mm long, off the main potline. This meant that the grapnel anchor would come directly over the top of the hauler if the hauler was not stopped. It is good practice to have the anchor weights tied some 1500 to 2000mm off the main pot line to avoid this potential hazard.

4. Although the line hauler was originally fitted with an ejector knife, this had been removed sometime before the accident took place and notre-fitted.

5. The hauler was designed and made locally by persons with no previous design or manufacturing experience with equipment of this type.

Comment

1. If the line hauler had been operated correctly, by the use of the control lever throughout, it is most unlikely that this accident would have occurred.

2. The booklet "Fishermen and Safety", which is published by the Marine Safety Agency, offers the following pertinent advice: "Winches, power blocks and ship cranes can be very dangerous if not properly used. Many fishermen have been killed by them. Do not operate them, unless you have been trained to do so by an experienced man."

3. The hauler was in an unsafe condition without its ejector knife. It should not have been used.

4. A line hauler is an item of specialised machinery which incorporates numerous safety features. Such equipment should always be designed and manufactured by companies with

widely recognised expertise in the field. It is potentially dangerous to the end user if non-specialists have undertaken this work.

16. STERN TRAWLER CAPSIZES DURING TRAWLING OPERATION

Narrative

A 10 metre, steel fishing vessel was towing a stern trawl across well known fishing grounds. She had a crew of three; two were asleep in the forward cabin and one was on watch. The vessel was being steered by the auto-pilot.

Weather conditions were good with easterly winds of force 4 - 5. A one metre swell was running. The vessel was heading almost directly into the wind but she was being assisted by a 3 knot stern current. Suddenly and without warning the vessel heeled over and veered to starboard. The Skipper and the deckhand were thrown out of their bunks. Within seconds the Skipper had made his way to the wheelhouse. Already the starboard wheelhouse windows were lying in the water and water was entering the wheelhouse from around the edges of the wheelhouse door. He managed to radio a brief MAYDAY message before ordering the crew to abandon ship.

With the starboard wheelhouse door in the water the crew had to leave by the accommodation door on the port side. On the way they picked up their liferaft. When they came out onto the aft deck the water was lapping at the sill to the door. The liferaft was launched and the crew boarded it. They were rescued unharmed some two hours later by the local lifeboat after their liferaft had been located from the air.

Observations

1. This accident clearly shows the benefit of a secondary means of escape in the event of an emergency.

2. It is believed that the starboard trawl door snagged on the bottom. The vessel capsized because she veered across the snagged trawl warp (a manoeuvre known as "girting") whilst still maintaining a relatively high forward speed. Tug operators are only too familiar with the dangers of girting. The likelihood of girting can be reduced by towing from a point as close to the stern as practicable, and the risk of capsize from girting can be minimised by keeping the towing point as low as possible.

3. None of the crew were wearing life-jackets which were stored in the accommodation, when they abandoned ship. In the urgency to get out of the accommodation with the liferaft no life-jackets were collected.

4. The crew were extremely fortunate that the vessel capsized to starboard and not to port since the liferaft was stored in the forward accommodation on the port hand side, just inside the door. If she had capsized the other way they may well have had to abandon ship without the liferaft. In those circumstances it is unlikely that the crew would have survived.

5. Consequently, by the time the Skipper came to board the liferaft it was drifting off and he had to swim after it. Because he might not have been able to reach the liferaft, his life was put at risk and his chances of surviving the cold were reduced because he was soaked through. Had the correct procedure been followed he would have boarded the liferaft while he was still dry.

6. The crew experienced some problems with two aspects of the liferaft's equipment: a flare failed and the ties to the canopy hood pulled off. The liferaft had not been serviced for at least two years.

7. All crew members had attended a Basic Sea Survival Course.

Comment

1. Life-jackets should be stored where they are readily to hand in the event of an emergency.

2. There is no mandatory requirement for fishing vessels of less than 12metres in length to carry liferafts, although the Department of Transport strongly recommends that they should do so. The crew of this vessel owe their lives to the fact that they were carrying a liferaft.

3. The practice of storing liferafts inside accommodation areas is potentially dangerous. In this case the liferaft may have been inaccessible if the vessel had capsized to port instead of starboard. Merchant Shipping Notice No M.1467 recommends that life rafts are fitted with float-free arrangements whereby the life rafts are automatically released and activated from a sinking vessel.

4. Liferafts should be serviced at intervals not exceeding 12 months.

17. TWO COCKLE DREDGERS CAPSIZE

Case 1

Narrative

A 9.91 metre steel cockle dredger was manned by a very experienced crew of two. She was in the process of recovering her dredge. Conditions were winds north north easterly force 4 and a wave height of about one metre. During this activity she drifted beam on to the waves and was rolling heavily. In one particularly large roll, the two bags of cockles on deckshifted to the low side and she capsized.

Fortunately the depth of water was less than 2.5 metres and the vessel lay on her starboard side on the seabed with her port side clear of the water. Both crewmen clambered to safety on the port side from where they were rescued within half an hour of the accident.

Observations

1. At the time of the accident the vessel had a deck cargo of approximately1.5 tonnes of bagged cockles. This was less than the 4 tonnes normally carried.
2. The Skipper operated the winch during the recovery of the dredge and the vessel's helm was left unattended.
3. The cockle bags were not secured against movement.
4. The stability of the vessel had never been assessed by a suitably qualified person.
5. The vessel did not carry a liferaft.

Case 2

Narrative

An 11.92 metre cockle dredger was loaded with a deck cargo of some 6 to 7tonnes of cockles. She was manned by a very experienced crew of two.

When returning to port from the sands, in darkness and in fresh weather conditions, she encountered a series of large waves. The vessel heeled toport, an unsecured bag of cockles slid across the deck and the unsecured riddle fell outboard. She capsized and the crew took to a liferaft.

Within minutes the vessel had turned completely upside down and the crewsoon lost sight of her. The crew were rescued some seven hours later by a fisheries research vessel.

Observations

1. The cockle bags had not been secured against movement.
2. The riddle had not been secured against movement.
3. The vessel's course back to port took her beam on to the weather. In the darkness the Skipper had no warning of the approaching waves.
4. The stability of the vessel had never been assessed by a suitably qualified person.

Comment

Case 1

1. Because of the rising concern about the stability of this type of vessel and with the full co-operation of the Owners and their Insurers, MAIB arranged for the vessel to be measured and inclined. A Naval Architect was contracted to undertake this work as well as a computer analysis of the vessel's stability characteristics.

2. It was concluded that the design of the vessel was unsuited for cockle dredging, because her stability and freeboard were below the Department of Transport's recommended minimum values.

Case 2

Although this vessel was salvaged she was not inclined. However, examination of the vessel indicated that her range of stability to the firstdown flooding point was insufficient to allow her to meet the Department of Transport's recommended minimum values.

General

The common practice of storing and transporting a cockle catch on the weather deck is potentially very dangerous. It should not be attempted unless both the following conditions have been met:

1. the bags are securely prevented from shifting should the vessel suddenly heel and,

2. the freeboard and stability of the vessel in the loaded condition have been assessed and found to be adequate by a suitably qualified person.

18. STERN TRAWLER FOUNDERS DUE TO LACK OF MAINTENANCE

Narrative

A 24 metre steel stern trawler, with six persons onboard, was fishing 150miles to the west of Shetland when the bilge level alarm gave the first warning of flooding in the engine-room. The bilge pump was started. The Engineer attempted to close the sea valves but was unable to close them all as the operating handles were, by that time, under water. Attempts to limit the flooding using a portable pump from on deck also failed.

The Skipper and five crew abandoned the sinking vessel about 25 minutes after the initial alarm. The weather was sunny with a wind of force two. All six persons were subsequently picked up by the Coastguard helicopter and transported to Lerwick. There were no injuries and there was little pollution as a result of the accident.

Observations

1. There had been a history of extensive corrosion problems which, on previous voyages, had necessitated emergency repairs to sea water pipes in the engine-room. These problems were well known to the Skipper/Owner and to all the crew. The likely cause of the flooding was due, initially, to these corroded pipes.

2. The cabin flooded in addition to the engine-room.

3. The crew abandoned the vessel hurriedly and left doors and hatches open.

Comment

1. The most plausible explanation of how flooding progressed from engine-room to cabin is that a non return valve in a scupper drain pipe which connected the two spaces, did not operate. This was probably due to lack of maintenance.

2. The Fishing Vessels (Safety Provisions) Rules 1975 stipulate that the main machinery space shall be bounded by watertight bulkheads.

3. Detailed calculations have shown that if the flooding had been restricted to the engine-room and casing only, the vessel would probably have survived. In this condition the stability of the vessel would have been significantly enhanced if the weather tight door to the shelter had been closed.

4. In order to increase the likelihood of a vessel surviving, or to delay her sinking for as long as possible, all internal and external doors and hatches should be closed when the vessel is abandoned. Other pertinent advice is given in Merchant Shipping Notice No M.1327.

19. MAJOR FACIAL INJURY SUSTAINED WHILE SHOOTING NETS

Narrative

A 24 metre stern trawler was shooting her gear while proceeding in an easterly direction. The wind was southerly force 6 - 7. The starboard bridle chain parted and the shooting operation was temporarily suspended in order to carry out a repair. The repair took approximately 20 minutes, during which time the effect of the prevailing weather caused the trawl gear to act as a drogue and resulted in the vessel swinging to port and taking up a northerly heading.

Upon completion of the repair, the Skipper attempted to return the vessel to an easterly heading by applying starboard helm. This resulted in both bridles leading to starboard across the top of the stern bulwark. The portbridle became twisted, a common occurrence. A crewman, who was stationed on the aft deck, then undertook his usual task of manually untwisting the bridle, using a length of steel pipe which he inserted into the outboard eye of the bridle swivel. The motion of the vessel in the seaway caused the steel pipe to rise out of his reach and to move towards the port side. It then lowered back down onto the stern bulwark and fell out of sight down the port side of the vessel. The vessel rolled to starboard and the portbridle, which was still leading to starboard, sprang over the top of the port bulwark and caused the steel pipe to strike the crewman in his face.

Observations

1. Both the Skipper and the crewman were very experienced fishermen.

2. The shooting operation was normally conducted with the vessel maintaining a steady course and speed. This enabled any twists in the bridles to be manually removed in full view of the Skipper in the wheelhouse, without danger of the bridles springing across the stern.

3. An intercom provided an available means of verbal communication between the wheelhouse and the aft deck.

Comment

1. Both the Skipper and the crewman failed to recognise the potential danger of the bridle wire springing across the stern as it rose above the port bulwark top.

2. Although the Skipper had some misgivings about the crewman trying to untwist the bridle in the prevailing circumstances, he took no action to stop him.

3. It was unnecessary for the crewman to undertake this task at that time and it would have been prudent for him to have kept well clear of the gear until the manoeuvre had been completed, with the bridles leading astern. Appropriate advice in this regard is provided in "Fishermen and Safety", which is published by the Marine Safety Agency (MSA) and can be obtained free of charge from any MSA Marine Office.

4. Use of the available intercom would have readily enabled the Skipper to inform the crewman of his intended manoeuvre and of any safety concerns he may have had in this regard.

5. The use of more efficient types of swivels can ensure that bridles are automatically kept clear during shooting operations, without the need for manual untwisting.

6. It is essential that Skippers fully appreciate their responsibility for the safety of their crew. In this regard, they should ensure that their intentions are communicated to and fully understood by the crew and that immediate action is taken to stop any practice which is considered to be unsafe.