Marine Accident Investigation Branch (MAIB) - Safety Digest 03/1996

Contents

1. ENGINE-ROOM FLOODING, ENGINE FAILURE AND EVENTUAL GROUNDING

Narrative

A 16,000 gross registered tonnage Bahamian bulk carrier had a mixed nationality crew of 25. The Master had been with the ship for over three years, the Chief Engineer for six months. Shortly after sailing, a quantity of water was found in the engine bilges which was more than the bilge tank could hold. It was decided to pump the excess into the after peak tank using the ballast line and the emergency direct bilge suction.

Simultaneously, the remote hydraulically operated sea and tank valves and the manual direct bilge suction valve were opened. During this operation the bilge water level rose covering the main engine crankcase shaft seal and a fall in oil pressure indicated that water was entering the crankcase. The main engine was stopped. Preparations were made to transfer bilge water to the aft peak tank through hoses connected to the bilge and fire pump discharge. During these preparations the main engine was restarted. About one hour later, the main engine was stopped again so that the contaminated lub oil could be transferred into the dirty oil sump storage tank.

Once this transfer was complete, a new lub oil charge was run down from the storage tanks but as it was cold this took some time during which the vessel drifted, eventually anchoring only 1.5 miles off the coast. Five minutes after anchoring, the Chief Engineer informed the Master that the engine was ready. The Master started weighing anchor only to be told that the engine would not start due to thick, unheated fuel oil in the system. The vessel dragged anchor and drifted closer towards the shore before re-anchoring.

Six hours after first anchoring, the main engine was started but whilst weighing the anchor the vessel grounded.

The vessel managed to manoeuvre further out to sea where she re-anchored to assess the situation. The rudder was inoperative, the bow was damaged and two ballast tanks were holed.

Observations

1. The Master was experienced and qualified and was familiar with the handling characteristics of the vessel and deck machinery. Although only 12 miles off a lee shore when the initial breakdown occurred, he did not advise the Coastguard. Having eventually anchored 1.5 miles offshore and with little sea room to manoeuvre, he should not have started weighing anchor until the main engine had been started.
2. It was fortunate that serious damage was not caused to the main engine bearings by running the engine with low oil pressure and water contaminated lub oil.
3. The Chief Engineer knew that the cold fuel oil would delay the main engine starting and should have reported that fact to the Master.
4. The use of emergency bilge suctions to pass bilge water through ballast lines is an extreme measure but provided the non-return valve fitted is operational, the bilges should have been drained quite quickly. A delay in starting the pump with the sea valve open and a defective non-return valve on the bilge suction, could be expected to cause rapid back flooding. Bilge high-level alarms had sounded while the vessel was in port but no-one investigated the situation.

5. Apart from technical considerations, a communication problem existed between the Chief Engineer and the Chief Officer because neither could speak each other's language and both had only a limited knowledge of English.
6. Although not suffering a language problem, the Master and Chief Engineer did not communicate properly and failed to explain the actions they were taking and their likely outcomes.

Comment

1. It was fortunate that the vessel was only slightly damaged with no loss of life or injury to the crew. The circumstances of the incident had all the ingredients of a major disaster and it was fortuitous that the weather did not deteriorate. Considerable quantities of fuel and lubricating oil were on board and there was a risk of serious pollution.
2. Vessels operating with a multi-national crew need to pay close attention to communication and clarity of instructions. Whilst reasonable competence in the English language is acceptable for every day work, unusual requests between different nationalities require extra care and confirmation prior to implementation.
3. Given the vessel's position off a lee shore, the Master should have advised the Coastguard of the situation and of his intentions.
4. Emergency direct bilge suctions should be checked at regular intervals for ease of operation and the effectiveness of the non-return valve. They are fitted for emergency use only, and for that reason their condition should never be in doubt.

2. ENGINE-ROOM FIRE ALONGSIDE OIL BERTH

Narrative

An oil tanker of 2,979 deadweight tonnes was using a cargo pump to discharge ballast to shore facilities. The pump was driven by an auxiliary engine located in the engine-room. A connecting rod punctured the engine entablature which caused a fire to start. As soon as the engine-room smoke detection alarm was activated the general alarm was sounded and the port emergency plan was initiated. The fire was eventually extinguished by the shore fire brigade using high expansion foam. There were no resultant injuries to personnel.

Observations

1. The connecting rod of the auxiliary engine probably became detached due to a fractured rocker arm, preventing the opening of the exhaust valve, and subsequent overloading on the respective piston.
2. The cause of the fire is deduced to have been an ignition of crankcase oil vapour by the hot white metal of the bottom end bearing.
3. Operation of the remote pull-wire arrangement failed to initiate the gang release of the fixed CO2 fire extinguishing system. A local attempt to release it was aborted when the CO2 bottle room had to be evacuated due to leakage from a joint on the pressure alarm sensor fitted to the gas manifold.
4. The minimal forward draught of the vessel prohibited an intake of water from the sea to the emergency fire pump. An alternative intake from the forepeak was unavailable because the tank was empty.
5. The auxiliary engine could not be stopped because the bridge remote stop arrangement, although installed, was not connected. The fuel tank quick-closing valves were shut but, because the fuel in the common fuel line to the multi-engine installation was of sufficient capacity, the auxiliary engine continued to run for a prolonged period.
6. The engine-room ventilation trunking had years of accumulated oil internally and thick coats of paint externally which contributed to the intensity of the fire. The engine-room had been in a dirty condition.
7. A crew member had to be rescued from his cabin after failing to respond to the sound of the general alarm. A number of false alarms had occurred in the past and he assumed that this was another one.

Comment

The management company has been advised to:

1. Clean the engine-room and engine-room ventilation trunking;
2. Ensure that auxiliary engines can be shut down by the intended remote means;
3. Pressure-test the CO_2 manifold and fittings to the working pressure;
4. Conduct periodic checks to ensure the security of the CO_2 pressure alarm sensor;
5. Confirm the effectiveness of the remote control wire for the CO_2 release;
6. Maintain a log of fire alarm initiations in order to ascertain the frequency of false alarms;
7. Give an assurance that the emergency fire pump will always be available to maintain pressure on the fire main;
8. Issue standing orders for crew members to respond promptly to any emergency alarm.

3. FLOODING THROUGH BILGE INJECTION SYSTEM

Narrative

Prior to sailing from a port the bilge high-level alarm sounded on a general cargo vessel of 1,041 gross registered tons.

Shortly after departure whilst two general service pumps were being used to supply the fire and deckwash line, it was noticed that the bilge water in the engine-room was rising. Eventually the level was such that bilge water was thrown by the engine flywheel towards electrical equipment essential for the operation of the main engine. To reduce the amount of spray, engine speed was reduced. This caused the stand-by lub oil pump to switch in automatically and to short circuit, resulting in a temporary loss of electrical power to the vessel.

The main engine was stopped and the vessel rolled heavily in the prevailing weather conditions. All sea water suction valves were shut and the accumulated bilge water was then pumped overboard. The main engine was subsequently restarted and the vessel proceeded to a safe anchorage.

Observations

1. The Chief Engineer reported that it was normal practice to connect the port and starboard general service pumps in series to boost the discharge pressure to the fire and deckwash line.
2. Both pumps' bilge injection non-return valves were found to be held in a partially opened position by an accumulation of swarf and rags.

Comment

1. The bilge high-level alarm had sounded while the vessel was still alongside. Measures should have been taken to discharge the bilge water ashore prior to departure.
2. Flooding of the engine-room was due to seawater being pumped back through the partially opened non-return bilge valves by the two series-connected general service pumps.
3. Bilge injection lines are not fitted with strainers. It is, therefore, most important that engine-room bilges are kept free from accumulations of debris so that the pumping system can be used effectively at all times.
4. Merchant Shipping Notice No M.788 provides advice on bilge pumping and injection systems.

4. TWO CASES OF INTERACTION

These cases both involved the effects of interaction, but in quite different circumstances.

Case 1

Narrative

A loaded bulk carrier of 7,482 gross registered tonnage was overtaking a general cargo vessel of 524 gross registered tonnage in a narrow channel. Both vessels were under pilotage. It was agreed between the vessels on VHF radio that the general cargo vessel would leave the channel to enable the bulk carrier to overtake on the port side and at a safe distance.

The bulk carrier had reached a point abeam of the other vessel as they approached the next starboard hand beacon, which indicated the lateral extent of the channel. The general cargo vessel then altered course to port so as to pass inside the beacon. The bulk carrier increased speed to emergency full ahead in an attempt to avoid a close quarters situation. However, the vessels converged and the effects of interaction caused the smaller vessel to sheer to port and collide with the bulk carrier. There were no injuries and damage was minor.

Observations

1. The pilot on board the bulk carrier called the general cargo vessel on VHF radio after the latter vessel had altered course to port but received no response.
2. The draught of the general cargo vessel was only three metres and the vessel could have remained outside the channel and passed safely outside the beacon.

Case 2

Narrative

A 12 metre workboat was requested to assist in the berthing of a coaster. As the coaster approached her intended berth, the workboat proceeded alongside and then moved forward towards the bow of the coaster to take a tow rope.

As the eye of the tow rope was being taken on board the workboat, her heading was altered to starboard in order to increase the distance between the vessels. However, the port quarter of the workboat struck the stem of the coaster; the workboat then swung rapidly to port and across the stem of the coaster. The workboat was pushed over to about 55° before righting herself. There were no injuries, although one of the two crewmen was thrown into the water and the workboat was partially flooded.

Observations

1. The coaster was proceeding at about 4 knots.
2. The effect of interaction pushed the stern of the workboat away from the ship's bow, causing it to swing to port and across the stem of the coaster.

Comment

Merchant Shipping Notice No M.930 is entitled "Interaction Between Ships". The Notice provides advice on the causes of hydrodynamic interaction and the measures that can be taken to reduce its effects significantly.

Case 1

Overtaking manoeuvres in a narrow channel should be carried out at slow speed and, having agreed to an overtaking manoeuvre, the vessel being overtaken should be prepared to take further action, particularly if the overtaking vessel is larger and less able to manoeuvre.

Case 2

Berthing manoeuvres with workboats in close attendance should be undertaken at very slow speed for two reasons:

1. When a workboat moves forward towards the bow of the larger vessel, there is an initial tendency for her own bow to be deflected away. As she moves further forward, there is then a tendency for her stern to be deflected and for her to develop a sheer towards the bow of the other vessel.
2. The flow of water around the bow of the larger vessel causes a consequent decrease in the stability of an attending workboat and there is an increase in the likelihood of capsize if the vessels should make physical contact.

5. REPORTED CARGO HOLD FIRE AT SEA

Narrative

A 1978 built, Panamian registered general cargo vessel of 11,084 gross registered tonnage, had loaded a cargo of baled plastic waste plus a deck cargo of 17 containers on the Continent for the Far East. When close to a UK port, a crew member reported smoke from the ventilator of No 5 hold 'tweendeck starboard. A brief inspection was carried out by the Master who confirmed that fumes were coming from the ventilator and closed the fire flap. The booby hatch for No 5 hold was opened and thin smoke or fumes could be seen. The hatch was re-secured and all drain lines from the hatch sealed with tape. The smoke detecting system for the hold was then switched on but it did not register any alarm. The fire alarm was sounded and the crew went to their fire stations. Preparations were made to use the CO_2 flooding system whilst fire hoses were rigged and boundary cooling of the hatch and adjacent deck started.

The shore authorities were advised and all hold ventilation shut down. The fire brigade boarded with the pilot and carried out an assessment of the situation whilst the vessel proceeded to her anchorage. A two man fire team equipped with self contained breathing apparatus entered the hold but were unable to progress very far due to the dense cargo stowage. After further consultation, 13 bottles of CO_2 were discharged into No 5 hold forward, port and starboard upper 'tweendeck and the lower 'tweendeck and a decision made to leave it overnight.

Approximately 16 hours later, the fire brigade re-boarded the vessel and carried out an inspection, a further nine bottles of CO_2 having been discharged into the hold during the night to maintain the cover. With no apparent sign of smoke, the hatch covers were lifted in sequence until all hatch covers were open. Thermal image cameras failed to find any evidence of a hot spot and with no further sign of smoke or fire, entry was made into the lower hold but no evidence of combustion was found. The hatches were left open overnight with a fire watch and a further entry made the following morning after a number of bales had been removed to give better access. Again no evidence of any fire was found.

Observations

1. The vessel has four holds forward of the bridge and accommodation, and one hold aft, (No 5) - the latter was originally used for refrigerated cargo. No 5 hold has upper and lower 'tweendecks above deep tanks. It is further divided into a forward and aft section with the forward upper 'tweendeck section also divided into port and starboard compartments. There are three hatch openings, one each for the port and starboard upper forward sections and one for the aft section. The hatch covers for these aft hatch openings are insulated hinged steel covers which are operated by the aft derricks.
2. The combined smoke detecting and CO_2 fire extinguishing system, originally fitted when the vessel was built, was tested weekly and had previously been in use during the preceding loaded voyage. The system uses a standard dual pipeline arrangement whereby the same pipes used by the smoke detection unit are also used, via a three-way valve, to discharge CO_2. Normally the system would be turned on just prior to departure, but on this occasion it had been overlooked. Although turned on for a brief period when the "smoke" was first sighted, no alarm condition occurred. Once the three-way valves had been turned onto the CO_2 discharge position in anticipation of a rapid discharge, no further smoke test could be carried out.
3. The cargo, described as "plastic waste", consisted of bales of assorted film and plastic material in various colours, shapes and sizes. The bales were cube shaped measuring approximately 1.5 metres, slightly compressed, and covered with a thin layer of shrinkwrap. Each bale, whatever the content, weighed about 2.82 tonnes.

Comment

1. The reported "smoke" was subsequently suspected to be a mixture of steam and/or vapours with entrained rubbish debris. The plastic waste cargo had been stored in the open and was likely to have accumulated a degree of moisture. Once stowed below decks in a warm environment, a rise in the humidity within the hold led to the generation of water vapour in the ventilated air when discharged on deck. Given the nature of the waste, contamination of the air by decomposing particles gave an impression of burning.
2. Although the failure to switch on the vessel's smoke detecting system was a serious error, the subsequent actions of the Master and crew on discovering the "fire" were correct and the proper fire fighting procedures were carried out. The vessel was embarking on a 35 day voyage with 34 persons on board and any hesitation on the part of the Master in seeking advice might have had serious implications for the safety of the vessel and crew.

6. INHALATION OF HARMFUL FUMES

Narrative

A standby safety vessel was attending an offshore installation in the North Sea. A deck rating was undertaking normal cleaning duties in the survivor reception area. In preparation for cleaning the linoleum deck covering, he mixed together a solution of metal cleaner and disinfectant. The mixture gave off ammonia fumes which caused the rating to suffer respiratory difficulties.

He was taken on deck and given oxygen to assist his breathing. Subsequently he was transferred to the offshore installation and then to the mainland for medical observation.

Observations

1. Handling precautions were printed on the outside of the metal cleaner container and included the instruction: **"Do not mix with any other materials, except where directed"**.
2. The management company has since issued a safety memorandum to its fleet. The memorandum reminds personnel of the need to refer to the product data sheets provided on board or to acquire the necessary information from ashore before using any substance that could be hazardous to health. The memorandum also instructs personnel never to mix substances unless specifically instructed to do so.

Comment

1. This accident highlights the reason for using substances only as directed. Handling precautions, which were printed on the outside of the metal cleaner container, were either not read or ignored by the rating.
2. General advice on the control of substances hazardous to health is provided in Section 1.5 of the "Code of Safe Working Practices for Merchant Seamen".
3. Merchant Shipping Notice No M.1520 refers to the more specific advice which is provided in product data sheets to ensure that substances are used in a correct and safe manner. The Notice reminds owners, masters and agents of ships of their duty to ensure that such sheets are provided on board and made available to all crew members who are required to use those substances.

7. DUST CLOUD EXPLOSION IN CARGO LOADING EQUIPMENT

Narrative

A vessel was involved in transporting various materials to and from offshore drilling rigs in the North Sea. On one occasion, a cargo of resin coated proppant material (a coarse aggregate used in the offshore drilling industry) was brought into port and discharged into trucks using a vacuum system. This material was re-bagged for offshore use later in the year.

About six weeks later the vessel was moored alongside and preparations made to receive the, by then, bagged material. To load the material the bags were cut open and the contents discharged under gravity into a hopper which fed into the cargo silos of the vessel. A mobile crane was used to lift two bags at a time over the mouth of the hopper where the bags were cut open manually. To assist this process, three dockers stood alongside the hopper to guide the bags into position as well as to cut them open. This loading procedure had been used frequently in the past without incident.

The operation started as programmed, two bags being cut open and the contents discharged into the cargo silos. The next two bags were raised into position and the third bag cut open whilst the fourth bag rested on the side of the hopper. Shortly after the contents of the third bag began to pour into the cargo silo, an explosion occurred. The force of the explosion was sufficient to launch the 100kg hopper six metres into the air with the hopper eventually landing on the quay some ten metres from the ship. Nobody was injured and there was no fire. All loading operations were stopped and various authorities informed. The cause of the explosion was probably a combination of an electrostatic charge generated by the discharging operation and the volume of free dust in the cargo silo/hopper.

Having taken advice, the vessel, hopper and crane were earthed together whilst the dust content in the cargo bin was reduced by attaching a vacuum trunk to the silo during loading. As a further precaution, the hopper was chained down to the vessel and the bags cut open by a spike fitted to the hopper. Once these modifications had been carried out, loading re-started. After two bags had been successfully emptied into the silo a further explosion occurred resulting in a large blue flame coming out of the hopper. Loading operations were stopped whilst further discussions took place. As a result of these discussions, the following was agreed:

- All re-bagged proppant was quarantined.
- Only new proppant to be loaded until further notice.
- Silos to be purged with nitrogen, oxygen content to be less than 8%.
- Samples of re-bagged proppant to be tested.

Tests of the proppant established that this particular batch was off-specification and generated three to four times as much dust as normal.

Observations

1. The cargo was a ceramic ball type of cargo described as a resin coated proppant. The tests carried out by the manufacturer showed that this particular batch of proppant had a higher tendency to produce dust under high shear conditions than standard batches.
2. A further investigation into the possibility of the batch being contaminated by other chemicals was carried out but no contaminants were found.

3. The manufacturers have confirmed that new Quality Assurance/Quality Control procedures are now in place which should ensure that off-specification proppant does not enter the supply chain. The loading of new proppant will therefore not require any special procedures as the fuel for ignition (phenolic dust) will not be present.

Comment

1. This incident highlighted the need for consistent Quality Assurance and Quality Control procedures to be in place during the manufacturing of this material.
2. The vessel was to carry a cargo which had been loaded in a similar manner, without a problem, many times before. This incident illustrates the ease with which off-specification cargo can be presented for loading without either the ship's staff or stevedores being aware of the fact.

8. SEAMAN INJURED WHILE OPENING HATCH COVERS

Narrative

The hatch cover sections on a general cargo vessel were being hauled to the forward end of the hatch trackway by means of a chain connected on both sides of the hatch cover to an hydraulically operated gypsy located at the forward end of both hatch trackways. A riding turn developed on the port side gypsy wheel. The hauling was stopped while a seaman attempted to clear the riding turn manually using a hatch bar. The haulage chain, which was still under tension, suddenly jumped off the gypsy wheel and caused the hatch bar to strike the seaman, fracturing his lower arm.

Observations

1. The riding turn was probably caused by unequal tension in the haulage chains, as the port chain was more slack than the starboard chain.
2. The haulage chains were adjusted and the crew instructed to walk back the chain if a riding turn developed in the future, rather than attempt to free it while under tension.

Comment

Operational short-cuts can often jeopardise safety.

9. MOORING BOAT CAPSIZES

Narrative

A vessel of 9,000 gross registered tonnage was manoeuvring alongside a berth under pilotage, but without tug assistance. The intended berth was between another vessel and a floating pontoon. Two headropes were run ashore by the forward mooring boat. The pilot then called in the stern mooring boat to run the after backspring, since the tide was from ahead. However, before this could be done, the vessel started to be set astern and the pilot instructed the stern mooring boat to keep clear because he was about to use the main engines.

The vessel was manoeuvred ahead and the pilot again called in the stern mooring boat. However, difficulty was experienced in securing the two headropes ashore and the vessel started to drift astern again. The pilot was unable to see the stern mooring boat but assumed that the boat was clear of the propeller. He then used the main engines again to manoeuvre the vessel ahead.

The resultant wash from the propeller caused the stern mooring boat to capsize. One of the two crewmen was thrown into the water but the other managed to climb from the upturned hull onto the floating pontoon. Both men were uninjured.

Observations

1. There was only 15 metres clearance at each end of the vessel when she was finally berthed alongside.
2. The pilot gave no instruction to the stern mooring boat to keep clear before using the main engines for the second time.
3. The man who entered the water was fortunately wearing a self-inflating life-jacket, which operated satisfactorily. He was able to grab hold of the safety rail on the boat's cabin.
4. By the time the vessel's engine was stopped again, the boat had heeled to about 90° and was seventy per cent submerged. It later righted itself. The bilge pump was still operable and was used to remove some of the water from the engine compartment.

Comment

1. The pilot failed to confirm that the stern mooring boat was clear of the propeller because he considered that any delay in using the main engines would result in the vessel contacting the floating pontoon astern.
2. Positive confirmation that mooring boats are clear of the propeller should always be received before the main engines are used.
3. The accident demonstrates the prudence of wearing an inflatable life-jacket when engaged in mooring boat operations.
4. It is probable that a single head rope could have been secured quickly, which would have enabled the vessel to be held against the tide without further need of the main engines.

10. PLEASURE YACHT COLLISION WITH FERRY CAUSED BY INTERACTION

Narrative

A pleasure yacht was proceeding to sea along the starboard side of a narrow river channel ahead of an outward bound passenger/Ro-Ro cargo ferry. The ferry increased speed and started to overtake close to the yacht's port side. The yacht's bow initially sheered to starboard and then rapidly to port. She then moved bodily to port as maximum helm was applied in an attempt to bring her back onto her original course. The helm had no countering effect and the yacht's bow collided with the stern of the ferry.

Observations

1. The overtaking manoeuvre was carried out at close range in order to allow sufficient sea room for an inward bound vessel to safely pass on the port side of the ferry.
2. The ferry gave no prior indication that she intended to overtake the yacht.

Comment

1. The ferry was an overtaking vessel and, as such, was required to keep out of the way by Rule 13(a) of the Collision Regulations.
2. In order to comply with Rule 8(d), the action taken by the ferry should have been such as to result in passing at a safe distance. The simultaneous passing of an inbound vessel caused the ferry to overtake the yacht at close range. In order to avoid such an occurrence, the ferry should have delayed her intended overtaking manoeuvre by reducing her speed in compliance with Rule 8(e).
3. The ferry should have indicated her intention to overtake the yacht in accordance with Rule 9(e) of the Collision Regulations. The yacht would then have had the opportunity of taking appropriate action to permit safe passing of the ferry.
4. The effects of the overtaking manoeuvre on the movement and handling characteristics of the yacht suggest that the collision was caused by hydrodynamic interaction between the vessels. The advice provided in Merchant Shipping Notice No M.930 was not followed by either vessel.
5. Merchant Shipping Notice No M.930 provides information with respect to interaction between ships which are attempting to pass one another at very close range. The Notice emphasises that interaction is most likely to prove dangerous when two ships are involved in an overtaking manoeuvre and that the smaller of the two ships will feel the greater effect.
6. The Notice continues to point out that it is important that the passing is carried out at a low speed and that an overtaking ship should only commence an overtaking manoeuvre after the ship to be overtaken has agreed to the manoeuvre. The speed should be sufficient to maintain control adequately but be well below maximum so that in an emergency extra power is available to aid the rudder if necessary.
7. The pressure fields which exist around a vessel are explained and the Notice advises that the effects of these pressure fields can be significantly increased where the flow of water round the ship is influenced, among other factors, by the boundaries of a narrow channel and by an increase in vessel speed.

11. FATALITY ON A TUG

Narrative

A tug was one of several engaged in assisting the berthing of a tanker. A tow rope was led from the towing hook of the tug to the centreline at the stern of the tanker. A bridle wire was led from a winch through a swivel block, located at the stern of the tug, to a saddle attachment positioned around the tow rope.

The manoeuvring operation reached a stage when the use of the bridle arrangement was no longer required. Two crew members left the wheelhouse in preparation to retrieve the bridle wire. One of them proceeded to a position on the after working deck between the leads of the tow rope and the bridle wire.

The bridle wire was slackened from a control position located in the wheelhouse. Slackening of the bridle wire caused the saddle attachment to slide rapidly down the tow rope which, in turn, caused the bridle wire to strike and kill the crew member.

Observations

1. On being instructed to retrieve the bridle wire, the crew members had both been expected to wait until the bridle wire had become slack before proceeding onto the after working deck.
2. The position taken up by the deceased on the after working deck was visually obscured to both the tugmaster and the bridle wire winch operator when at their respective control positions in the wheelhouse.

Comment

1. The deceased, having prematurely proceeded onto the after working deck, unnecessarily placed himself in a hazardous situation.
2. The tugmaster and the bridle wire winch operator were both unaware of the hazardous location of the deceased on the after working deck when the bridle wire was slackened.
3. The circumstances of this accident highlight the potential danger which exists when the design of the vessel obscures the winch operator's field of vision. In such circumstances it is essential that effective means of communication are both established and utilised.

12. FAILURE OF AIR INLET VALVE UNDER PRESSURE

Narrative

A 2,233 gross registered tonnage specialised carrier was moored alongside for main engine trials. In preparation for the trials the forward and aft air receivers inlet valves were opened and the air compressors started. When both air receivers had reached their maximum working pressure of 20.7 bar, the air compressors were stopped.

After closing the valve on the aft receiver, the Second Engineer started to close the inlet valve on the forward air receiver. Just before the valve was fully closed, there was a loud noise and the inlet valve assembly blew out of the valve block, catching the Second Engineer's gloved hand a glancing blow. The valve assembly then bounced off the aft air receiver and narrowly missed the Second Engineer's body. The safety plate fitted on the valve was bent through 90° by the valve as it was blown out.

Observations

The inlet valve assembly was subsequently found approximately two metres from the aft air receiver, alongside an adjacent pump. The screw thread on the valve body was found to be badly worn and covered with a copious amount of P.T.F.E. tape and jointing compound.

Comment

1. Regulation 20 of the Merchant Shipping (Cargo Ship Construction and Survey) Regulations 1984, (SI No 1217) states categorically that every pressure pipe or fitting shall be maintained in an efficient condition. Clearly this valve was not.
2. There can be no doubt that "repairs" of this nature on any pressure vessel are extremely dangerous and it was fortunate that the Second Engineer did not suffer serious injury or even death. This incident re-emphasises the need for constant vigilance during repair periods so that any work undertaken is to manufacturer's requirements, complies with all regulations, and is to the highest safety standards.

13. CREWMAN INJURED BY UNGUARDED MACHINERY

Narrative

A crew member was engaged in cleaning duties and general maintenance in the engine-room. He was drawn by his clothing into an operational pump, which was located below floor plate level, and fractured his leg.

Observations

1. The crew member was wearing cotton track suit trousers.
2. The pump was unguarded.

Comment

1. Although the pump was located below floor plate level, its operation at that time presented a hazard to the crew member.
2. Fishing vessel owners should be aware of Rule 17(1) of "The Fishing Vessels (Safety Provisions) Rules 1975" which states that machinery shall be installed and protected so as to minimise any danger to persons on board.

14. ENGINE FAILURE AND EVENTUAL LOSS OF VESSEL

Narrative

A 22 metre fishing vessel sailed from her home port in south-westerly force 5 winds and squally rain showers with moderate seas and poor visibility. When the vessel was about half a mile out of the port, the main engine stopped due to water contaminated fuel. Attempts were made to re-start the engine by draining the fuel lines, clearing the fuel filter etc but the engine failed to start.

The anchor was let go in an attempt to stop the vessel drifting, but it did not hold. The vessel eventually grounded on rocks and was extensively damaged. The Skipper contacted the Coastguard and the local lifeboat was launched. Half an hour after grounding all the crew had been rescued. The weather then deteriorated preventing any examination of the vessel over the next few days. When eventually boarded, an investigation was carried out on the vessel's fuel system to establish the possible cause of the contaminated fuel.

Because of the extensive damage to the vessel she was declared to be a constructive total loss.

Observations

1. The crew correctly identified water contaminated fuel as the cause of the engine failure but despite repeated attempts to remove the contamination by draining sections of the fuel line, they were unable to re-start the main engine.
2. The engine fitted to this vessel had a fuel system which absorbs considerable heat from unit injectors and the surrounding jacket water. In order to maintain engine performance at its optimum point, the fuel temperature must not exceed 66°C, and a sea water cooled heat exchanger was fitted to the fuel system.
3. It is probable that corrosion had occurred within the heat exchanger allowing cross contamination, and with the vessel dragging anchor the crew had insufficient time to identify the source of the problem and to take corrective measures.

Comment

This incident illustrates how important it is to carry out a thorough check of the main engine and auxiliary systems prior to putting to sea.

15. FISHERMAN LOST OVERBOARD

Narrative

The crew of a 23 metre crabber were hauling in a fleet of pots during the late evening in heavy weather and snow storms. The four crew men were stationed on the working deck with the starboard hauling hatch open, while the Skipper manoeuvred the vessel from the starboard side of the wheelhouse.

The vessel pitched heavily and the back rope, on to which the crab pots weresecured, and which was normally led through the lead block onto the hydraulic hauler, came off the hauler. At the same time the pot which had just been placed on the table, was suddenly pulled back overboard before it could be released. As the pot went overboard it knocked one of the fishermen, who had been standing with his back to the hauling hatch, into the sea.

The Skipper immediately put the engines into neutral, and he and the owner, who was on board, were going to throw lifebuoys into the sea to act as markers, but found they could not because the lifebuoys had been tied in place.

Having cut free the back rope, the vessel was turned around and because difficulty was experienced in manoeuvring close to the man overboard (the propeller pitch control cable had come adrift), the Skipper, who had by then managed to free a lifebuoy, jumped into the sea with it. He swam 20 metres to the fisherman who was floating face down in the water, managed to turn him on to his side and tow him back towards the vessel. A rope was thrown to the Skipper but he was unable to hold on to both the rope and the fisherman. Unfortunately the fisherman was lost.

The Coastguard had been alerted and it had been hoped that the Skipper, who was suffering from hypothermia, would have been lifted off by helicopter, but due to the atrocious weather conditions this was not possible. The crew managed to warm the Skipper and keep him in a stable condition until the vessel arrived in port some five hours after the accident. An ambulance met the vessel and the Skipper was taken to hospital.

Observations

1. At the time of the incident, the vessel was experiencing weather of force 8 to 9 with snow showers. The vessel was moving heavily, and the combination of rolling and pitching acting on the back rope, still effectively anchored to the sea bed, caused it to pull the loaded crab pot back over the side. The fisherman was probably off balance due to the vessel's movement and the blow to his upper body from a loaded crab pot knocked him backwards towards the open hauling hatch and into the sea.
2. The Skipper's immediate reaction in putting the vessel's engine into neutral and the subsequent actions of the owner and the rest of the crew were correct under the prevailing circumstances. Although both of the lifebuoys ready to hand were secured in place by string, it is unlikely that, given the weather conditions, the immediate deployment of a lifebuoy would have affected the final outcome.

Comment

1. When a potting vessel with a working side hatch is moving about in a seaway with the occasional wave coming inboard, the position from which the "lifting" operation is carried out is often slippery and unstable. It would be prudent for any crewman working on deck under the conditions described above to wear a safety harness (or belt with shock absorber) attached to a lifeline, see the Marine Safety Agency's booklet "Fishermen and Safety" - Other Dangers, and also Merchant Shipping Notice No M.1195. To avoid movement restrictions, an inertia clamp device could be fitted. In any case a fisherman working at the "lifting" position should wear a safety belt or harness fitted with a ring to allow quick and easy attachment of a rope.
2. When work is being carried out overside or in an exposed position where there is any risk of falling or being washed overboard, a lifebuoy with sufficient line should be provided ready to hand, see "Fishermen and Safety" and also Merchant Shipping Notice No M.1195.
3. Both the lifebuoys on the starboard side and the forward end of the wheelhouse were found to be secured with string possibly to prevent theft in port or to prevent them being washed overboard in rough weather. Nonetheless, tied as they were, they were not available for immediate use as required under Rule 98 of the Fishing Vessel (Safety Provisions) Rules 1975.

16. FATAL INJURIES CAUSED BY OUTBOARD ENGINE PROPELLER

Narrative

A rigid inflatable workboat, fitted with a 15kW outboard engine, was being manoeuvred alongside a vessel at anchor. The prevailing weather conditions were calm. The workboat was manned solely by an experienced coxswain who was sitting at the stern. The outboard engine was fitted with a "stop switch" lanyard which he had attached to his wrist.

On approaching the side of the vessel the coxswain had to remove the lanyard so that he could reach a headline located in the fore part of the workboat. However, before he was able to pass the headline to waiting personnel, the workboat started to drift away from the side of the vessel. The coxswain returned to the outboard engine and adjusted the throttle in order to increase ahead speed.

A sudden resultant acceleration and a subsequent contact of the workboat with the side of the vessel caused the coxswain to overbalance and to fall into the water. As he came to the surface, he was struck by the revolving propeller and received fatal head and facial injuries as a result.

Observations

1. The purpose of a "stop switch" lanyard or "dead man's handle" is to stop an outboard engine if the operator accidentally falls into the boat or overboard. The lanyard is commonly provided as a standard fitting to outboard engines of 6kW and above.
2. The coxswain was keenly aware of the importance of the "stop switch" lanyard. However, because the boat was being operated single handedly, the coxswain had to remove the lanyard to make the boat fast alongside the anchored vessel.

Comment

1. The coxswain would not have had to remove the "stop switch" lanyard if a bowman had been available to pass the headline or if the headline had been located in a position within reach of the engine control position.
2. It is highly probable that the injuries sustained by the coxswain would have been far less severe had the "stop switch" lanyard been attached to his wrist when he fell overboard.

17. TWO PERSONS LOST OVERBOARD FROM SAILING YACHT

Narrative

A 10.15 metre sailing yacht was bareboat chartered for an intended voyage across the English Channel and back. She carried a crew of seven including the Skipper. The last weather forecast obtained before sailing was for north-easterly winds of force 5 to 7. It was considered that the wind would be coming from a favourable direction for the proposed cruise across the Channel.

The yacht sailed in the afternoon but during the night some difficulty was experienced in steering her and she made a number of uncontrolled gybes. As dawn broke it started raining and the visibility became poor, the crew were cold and miserable and some were sea-sick. It was decided that the best course of action was not to carry on to the proposed destination but to make for the nearest harbour. During the subsequent manoeuvre the sheets which had been snap-shackled to the jib broke loose; the jib was furled and not used again. However, while making the presumed approach to the harbour, a west cardinal buoy marking shallows was seen very close to on the port bow and it was realised that the tidal stream had been setting to the east and not to the west as had been assumed.

The yacht remained on course while one person checked the navigational chart. The eventual gybe back on to a westerly heading was not properly controlled because of the increasing wave heights. The mainsail boom swung over very quickly, the mainsheet went taut and came away from the boom end.

While attempting to drop the mainsail, the yacht was struck by a huge wave which washed four crew members overboard. All were attached to the yacht by harnesses and two managed to get back on board. One of the other two remained attached but it was not possible to pull him back on board and he did not survive. He was not wearing a life-jacket. The other person either slipped through his harness or removed it himself and was unable to get back on board; his body has not been found.

The remainder of the crew were rescued by a helicopter. The abandoned yacht eventually ran aground on the coast.

Observations

1. A proper handover, in accordance with the "Code of Practice for the Safety of Small Commercial Sailing Vessels", was not made at the commencement of the bareboat charter.
2. No proper passage plan was prepared before the start of the cruising voyage.
3. The yacht's track was not monitored after altering course for the nearest harbour.

Comment

1. Because only one mainsail reef of the three available was reeved, the Skipper had insufficient control of the yacht's sail area in the worsening weather conditions.
2. Sheets with snap shackles should not be used for foresails; bowlines are preferable.
3. A boom preventer may have proved beneficial in this case.
4. On sighting the west cardinal buoy and knowing that the danger lay to the east, the yacht should have gybed to the west immediately. It is possible that, if this had been done, the heavy breaking seas might have been avoided.