LESSONS LEARNED FOR PRESENTATION TO SEAFARERS
(FSI 21)

1 FATALITY

Very serious casualty: Fatal fall into cargo hold

What happened?

During cleaning of cargo holds by ship's crew while the ship was underway at sea, the residual cargo of iron ore was removed from the bilge wells and placed in a pile in each hold before being lifted up by means of buckets and a portable davit to the deck for disposal. The quartermaster and the oiler climbed down to the bottom of a hold to fill the bucket. The cadet operated the winch and the bosun worked the davit and directed the cadet. The bosun connected an empty bucket to the cargo runner and signalled the cadet to hoist it. Once the cadet had hoisted the bucket clear of the hatch coaming, he stopped hoisting but the winch ran on a little. The bosun swung the davit over the hatch coaming and then told the cadet to lower the bucket. But it did not move and the cargo runner went slack because the bulldog grips attaching a shackle to the wire were jammed at the head of the davit in between the sheave and the davit head. The bosun climbed onto the hatch coaming, walked along the top of it and grabbed hold of and pulled on the bucket trying to release the shackle from the davit head, but it did not come free. Then he pulled on the bucket again and, as he did so, the davit moved. As the davit moved, the bosun lost his balance and fell into the hold. He died of the injuries he sustained.

Why did it happen?

A working at height permit was not issued before the bosun climbed onto the hatch coaming and the risk controls that such a permit required were not implemented.

On board safety culture had not be fully and effectively developed as reflected by crew who did not take the opportunity to improve the future safety by engineering a solution to a known problem (jamming of cargo runner of portable davit); and the bosun who disregarded the SMS requirements relating to working at height and climbed onto the hatch coaming of the open cargo hold.

What can we learn?

Take note of small problems and work out safe solutions. In this case, the cargo runner of portable davit became jammed in the head of the davit when the bucket was being hoisted too high. The situation could have been improved or avoided if a mark had been put on the cargo runner to indicate to the winch operator when to stop hoisting, or if a preventer had been fitted to the cargo runner to prevent it from jamming in the head of the davit. Crews should never work at height without the proper safety procedures being implemented.

Who may benefit?

Seafarers.

2 FIRE

Very serious casualty: Ro-ro passenger ship fire

What happened?

A 20,000 gross tonnage ro-ro passenger ferry, with 203 passengers, 32 crew members and a full load of cargo units on board, was on a voyage which normally takes about 20 hours. About two hours after departure and just a few minutes before midnight fire broke out in one of the cargo units in the garage deck. The manually-operated drencher system was activated from the bridge but did not deliver any water. An attempt was then made to start the drencher system from the engine control room but this was also unsuccessful. The fire spread rapidly. Fire-fighting was difficult due to the thick smoke and eleven minutes after the first alarm the Master ordered the evacuation of the ship. While all passengers and crew were safely evacuated 23 people were injured, mostly from smoke inhalation.

Why did it happen?

The crew were unable to start the vehicle deck drencher system. The inability to start the drencher system pump remotely from either the bridge or the engine control room was most likely because a selector switch, which was located adjacent to the drencher pump and controlled the discharge valve on the drencher pump, was left in the "manual" position.

According to the voyage data recorder a self-closing fire door protecting a stair well from the vehicle deck remained open during the fire, allowing smoke and flames to reach accommodation and public spaces. The fire door was fitted with a self-closing mechanism, but it was not possible to determine whether this mechanism was functioning correctly at the time of the fire.

When the accommodation sprinkler system activated, a pipe connection parted, resulting in an uncontrolled flow of water into the engine room. The engineer-on-watch, concerned about the possibility of water damage to machinery and/or flooding of machinery compartments moved rapidly to the sprinkler room, located some distance from the main machinery room, to stop the sprinkler pump. In so doing he was unable to address other pressing issues such as the failure of the vehicle deck drencher system to operate. For reasons unknown no attempt was made to open the cross-over valve which would have enabled the ship's fire pumps to supply the drencher system. This valve was located in the sprinkler room.

What can we learn?

Possibly because of his pre-occupation with dealing rapidly with both the drencher and sprinkler system problems, the engineer-on-watch did not inform the command centre about the leakage from the sprinkler system so an opportunity was lost for him to gain assistance to deal with both issues efficiently. This emphasises the need to maintain good communication at all times.

The specific operation of drencher systems varies between installations. It is essential that crew members responsible for the deployment of the systems are made familiar with all methods of their operation, including necessary valve settings and sequence of actions. This can be assisted by:

- the provision of clear and simple schematic diagrams located at all operating positions, being mindful that operators may not all share a common native language;

- the clear marking of valves and switches – perhaps assisted by standard colour schemes;

- induction training for new crew members; and

- regular and realistic drills.

The limitations of drencher systems need to be recognised. The importance of early deployment if there is to be any chance of containing a fire needs to be stressed.

With regard to the failed coupling in the sprinkler system and the open fire door, while the reasons for these failures are not known, they emphasise the need to report any equipment malfunctions immediately, in order to allow for maintenance and repair work to be carried out.

When fire spreads rapidly through public and accommodation spaces good communication between the crew and the passengers is essential. This can be assisted by:

- crew members wearing high visibility safety vests to make them readily recognizable as a point of contact to passengers; and

- broadcasting emergency announcements in multiple languages to ensure that as many passengers as possible understand the information.

Who may benefit?

Seafarers, passenger ship, ro-ro ferry operators and managers, and Administrations.

3 FIRE

Very serious casualty: Explosion in machinery space

What happened?

A 2,500 gross tonnage ship was propelled by a 1470kw diesel engine. A few hours after the ship set sail, an air leak from a faulty air regulator was discovered in the main engine air supply. The ship was stopped to allow the faulty regulator to be changed for a spare.

While the repair was taking place the two running diesel generators stopped. Attempts to restart them led to all the starting air being used up. An attempt was made to start one of the generators using oxygen from a welding set bottle connected to one of the engine cylinders. There was an explosion and the Chief Engineer and an Oiler received serious injuries.

Why did it happen?

The reason the engines stopped running was not diagnosed and rectified before trying to re-start them. In consequence, starting air was wasted.

The energy released by the ignition of the injected fuel in an oxygen-rich atmosphere was much greater than the engine was designed for.

Personnel present during the preparation to use oxygen to start the engine were aware of the dangers but did not challenge the decision to use oxygen.

What can we learn?

Never attempt to use pressurized oxygen to start a combustion engine.

Diagnose the root cause of a machinery failure before attempting to restart the unit.

Cultivate a culture within the Company–ashore and afloat–which encourages justifiable challenges to unsafe decisions of superior ranks.

Who may benefit?

Seafarers.

4 FLOODING AND SINKING

Very serious casualty: Flooding and sinking of general cargo/containership

What happened?

During the early hours of the morning while a small containership was sailing, the engine-room bilge alarm sounded. The engine room was manned and the duty engineer noted a rising level of water below the bottom plates. The Master and Chief Engineer were called. By the time they both arrived in the engine-room, water had begun to cover the bottom plates.

No pumps were started in order to pump out the water. No other actions were taken to reduce the flooding or the water level. The source of the flooding was not established

The engine-room was abandoned half an hour after the ingress was discovered, however no efforts were made to ensure that watertight doors leading to the port and starboard passageways connected to the engine-room were fully and effectively closed and battened down.

The Master ordered that the ship be abandoned around 45 minutes after discovery of the flooding. The freefall lifeboat was launched another 35 minutes later with all crew on board (at 0320hrs). Problems were encountered with the engine of the lifeboat, which failed after 5 minutes due to a clogged fuel filter. The crew were all seasick in the lifeboat.

The Master reboarded the ship from the lifeboat around 0830hrs and communicated with head office. By this time, the main deck was awash in front of the accommodation, but the emergency generator was still running.

The entire crew was rescued shortly before noon by another ship. Although still afloat at 1700hrs, the ship eventually sank.

Why did it happen?

The engineer on duty took no immediate action to reduce the effect of the flooding, e.g. opening the emergency bilge suction and starting the ballast pump. (It has been calculated that the rate of water ingress was approximately the same as the capacity of the ballast pump.)

On arrival in the engine-room, neither the Master nor Chief Engineer ordered any action to reduce the flooding.

The watertight doors leading from the engine-room to the port and starboard passageways were not adequately secured. The ship had sufficient stability to remain afloat if these watertight doors had been secured.

What can we learn?

In this case the decision to abandon ship proved to be premature. Although safety of life must be the highest priority, abandoning ship should be the last resort as it brings its own dangers and removes from the scene the people necessary to help save the ship.

It is important for all ships to have contingency plans for dealing with the flooding of various compartments and to drill the crew against these plans.

All engineer officers should be able to take initial remedial action against flooding in the engine-room by opening the appropriate valves and starting pumps immediately.

The importance of securing watertight doors in emergency situation should be made clear to all personnel on board.

Lifeboat engines require prolonged running on test and not just a weekly run of a few minutes. This is necessary in order to uncover problems such as debris in the fuel tanks and lines.

Who may benefit?

Seafarers.

5 COLLISION

Very serious casualty: Collision between chemical tanker and cargo ship

What happened?

A northbound (course 322º) 11,100 gross tonnage chemical ship collided with a southbound (course 162^0) 2250 gross ton general cargo ship off the coast in good visibility. Initially the two ships were going to pass clear of each other with the chemical carrier passing ahead of the cargo ship, but when the ships were 0.8 miles apart, the chemical carrier made a late and bold alteration of course to starboard and towards the cargo ship.

The cargo ship, loaded with scrap iron, then altered her course to port, away from the chemical carrier, but this was insufficient to avoid collision.

The chemical carrier struck the cargo ship almost amidships, holing her. The chemical carrier applied full astern and pulled away from the cargo ship.

The cargo ship, with both holds holed, sank within a very few minutes. Five members of the 10-man crew of the cargo ship perished.

Why did it happen?

There was a failure to comply with International Regulations for Preventing Collisions at Sea on both ships: no early and clear alteration by both ships; and, there was a failure to assess the risk of collision.

An inappropriate alteration of course by the chemical carrier when it was too close to another ship.
Both ships were still at full ahead at the time of the collision.
The chemical ship pulled out of the holed cargo ship allowing flooding.

There were indications of fatigue on the part of both OOWs, who were near the end of their 6-hour watches.

What can we learn?

The importance of:

- keeping a good lookout, maintaining vigilance and complying with Collision Regulations;
- ensuring OOWs are well rested and alert;
- taking remedial action once a collision is unavoidable (stopping the engine, going astern); and
- not pulling out of a ship once a collision has occurred.

Who may benefit?

Seafarers.

6 FATALITY

Very serious casualty: Crew member loss of life as a result of an infectious disease

What happened?

After leaving port, a crew member reported that he had a headache and chills to the Chief Officer. Believing that the crew member had a cold, the Chief Officer provided cold medication although the master was the designated medical care officer. The next day the crew member was given pain relievers from muscle aches. The crew member continued to work as usual for the next 3 days until, while working on deck during the morning, he was sent to his cabin to rest. The crew member's temperature reached 42°C and the Chief Officer called the International Radio Medical Centre. Malaria tests were conducted and were positive for the malignant malaria type *Plasmodium Falciparum*. The crew member was given Malarone tablets, but he was vomiting repeatedly. The ship altered its course and increased its speed in order to reach a position where evacuation by helicopter would be possible.

Throughout the day the ship provided observations on the crew member's condition and received instructions from the Radio Medical Centre. Early in that evening, however, the crew member died.

Why did it happen?

The crew member was most probably infected with the virus during the port stay.

Medicine on board was not managed properly by qualified crew. The procedures used on board the ship did not ensure that only the designated medical care officer handed out medicine to the crew members.

Due to the port being situated in a "No or low risk of malaria area", the shipowner and shipboard management considered it unnecessary to prepare such a risk assessment, and no risk assessment was made considering local conditions.

What can we learn?

The importance of ensuring that all crew members are made aware of what diseases may be present at port, how to minimize contracting the diseases and their symptoms.

The importance of notifying the designated medical care officer of any symptoms exhibiting by crew members as early as possible.

Malaria medicine to be administered intravenously exists (which is available at hospitals) and could possibly have ensured that the medicine given was effective and not rejected.

Who may benefit?

Seafarers, shipowners and operators.

7 FATALITY

Very serious casualty: Man overboard while securing pilot transfer ladders

What happened?

While a 12,000 gross tonnage containership was at sea, the chief mate told the bosun and ratings that because of heavy weather, the previous day's standing order/work permit that no one was allowed to work outside the accommodation without permission from the master or chief mate was still in force.

At a watch change, the bosun told both the relieving rating and the relieved rating to follow him onto the foredeck in order to secure the pilot transfer ladders. The relieving rating, unaware of the chief mate's order because there had been no handover by the relieved rating, followed the bosun outside of the accommodations. Although aware of the standing order/work permit, the relieved rating did not dare challenge the bosun's order.

After securing the starboard side ladder they crossed over to the port side, the windward side, to secure the port side ladder. While the two ratings were working on it, the bosun was walking toward the accommodation on the port side, when he was washed overboard.

Immediately after the accident, rescue efforts by the ship, passing ships and the Rescue Coordinating Centre were initiated, but the bosun was not found.

Why did it happen?

The bosun did not follow the chief mate's instructions that prohibited working outside the accommodation. The bosun did not consult with the master or the chief mate about a work permit prior to the work on foredeck.

The relieved rating did not hand over the chief mate's instructions to the relieving rating, who had no concerns about working on the foredeck, resulting in acceptance of the bosun's work order.

The bosun went to the foredeck due to concerns about whether the pilot transfer ladders had been properly secured.

What can we learn?

The chief mate's instructions to crew on daily work under the conditions of heavy weather should be followed, and standing orders/work permits should be signed by the master or the chief mate before commencing the work.

The crew should be encouraged to discuss the decisions made by their superiors when having doubts or concerns about safety.

Safety notices should be posted on the accommodation doors leading to outside alleyways when work on deck is prohibited

When heavy weather is anticipated, the pilot transfer ladders and other movable objects on deck should be secured prior to the departure.

Who may benefit?

Seafarers, shipowners and operators.

8 FATALITY

Very serious casualty: Worker trapped in unloading equipment

What happened?

A 20,000 gross tonnage bulk carrier was berthed alongside and discharging cargo. Around midnight a wiper was stationed in the ship's conveyor belt tunnel to monitor the conveyor. He was equipped with a walkie-talkie to communicate.

On a routine round of the cargo system, the chief mate found the wiper trapped between the running conveyor belt and roller. The chief mate immediately activated the emergency stop button for the conveyor belt, sounded the alarm and called for assistance. The wiper had already died from his injuries.

Why did it happen?

Although safety meetings were conducted monthly, the chief mate and watchkeeping mates did not confer with the wiper about the risks he would encounter before commencing the task in the tunnel. Furthermore, there was no specified loading and unloading instructions on the conveyor belt tunnels. The wiper neither might have become aware of the hazard nor have known how to react when he spotted the irregularities in the tunnel.

Since no risk assessment of workplace was conducted after the installation of guard rails by the company, measures taken were inadequate to prevent the wiper from getting trapped in the running conveyor belt and to alleviate the damages caused by it. As the result, the wiper was trapped and could not stop the operation of the conveyor belt.

What can we learn?

To ensure that seafarers can work in a safe environment, it is imperative that companies conduct a hazard identification and risk assessment and that proper control measures are put into place.

Work instructions and standards operating procedures, which reflect the risk assessments and control measures, should be developed and that seafarers are properly familiarized with their use.

Before commencing the task, it is important to make sure that safety issues are communicated among the officers and crew.

Emergency stops should be placed so that they are immediately in reach of the seafarer at his working location.

Who may benefit?

Seafarers, cargo owners, shipowners and operators.

9 CONTACT

Serious casualty: Contact with a quay along a river

What happened?

A containership of about 18,000 gross tonnage left a berth on a river with a tug and was heading towards the south side of the river. As the ship's bow entered the main flood tidal stream, the bow unexpectedly paid off to starboard after the pilot ordered the helm to port. The pilot then ordered the helm to hard-a-port but the bow continued to pay off to starboard. The master and the pilot agreed to abort the manoeuvre and set the engine to full astern. The pilot also ordered the tug to return immediately to assist the ship, but the ship made contact with a quay on the opposite side of the river. The quay sustained superficial damage but the ship suffered significant damage to her bow with her forepeak tank punctured. There was no pollution and no one was hurt.

Why did it happen?

The flood tide acting on the port bow, coupled with the wind and the outward flow of water creating a counter-flow off the berth acting on the starboard quarter, was sufficient to overcome the turning effect of the applied port helm.

The margin for error in achieving the intended manoeuvre was small and the pilot had unintentionally not applied port helm until after the ship's bow had entered the flood tidal stream. The engine was set to full astern, but the ship's stopping distance exceeded the available space ahead.

It was the pilot's usual practice to release the tug after clearing the berth and establishing steerage. In his experience, he did not feel the need to retain the tug for a ship of this size.

The port authority relies on the judgment of the pilot to determine to what extent tug assistance is required.

The pilot had conducted the same manoeuvre, under similar tidal conditions, on a number of occasions without incident. The Information exchanged between the master and the pilot was limited to the condition and readiness of the ship. Both the master and the pilot considered the departure to be a routine operation which did not require any further discussion or elaboration.

Similar accidents had happened before, but the port authority had no means for ensuring that the identified lessons had been effectively promulgated to its pilots.

What can we learn?

It is essential that the masters and the pilots should exchange information regarding hazards they may encounter and its control measures to be taken before commencing the navigation.

Hazard identification and risk assessment regarding the effect of tidal stream on ships manoeuvre should be carried out appropriately.

Procedures for ships to use a tug when a strong tidal flow is anticipated should be established.

An effective way to disseminate lessons learnt to the pilots should be developed.

Communication among the pilots and the bridge team should be encouraged for the pilots to be able to draw the best decision-making.

Who may benefit?

Seafarers, pilots, and port authorities.

_____