LESSONS LEARNED FROM MARINE CASUALITIES
(III 9/19, ANNEX 1)

1 OCCUPATIONAL ACCIDENT

Very serious marine casualty: Fatality under fallen load

What happened:

A ship berthed to commence unloading operation. While the carbon anode cargo was being unloaded, a row of cargo in the hold fell over, and the stevedore who was unlashing the sling of steel plate at that time perished under the fallen load.

Why did it happen:

It was concluded that the factors that contributed to the accident were leaving the stacking level of the load units over the tolerable level during the unloading procedure, not taking into account the balancing considerations produced by the non-standard sizes of load units, and the way the job was done, with no effective monitoring and decision-making mechanisms.

What can we learn:

- Shipping companies should review the SMS procedures to clearly identify risks involved in different tasks and provide clear guidance to its fleet of ships accordingly.

- The Terminal representatives/Stevedoring companies engaged in loading/unloading operations on board should carry out a risk assessment effectively prior to the commencement of the tasks.

Who may benefit:

Ship Operators/Managers/Owners, Terminal Representatives, Stevedores.

2 OCCUPATIONAL ACCIDENT

Very serious marine casualty: Fatal strike by mooring line

What happened:

A general cargo vessel was moored alongside an anchored bulk carrier to load a cargo of grain using the bulk carrier's cranes. Towards the end of the loading process, it was identified that the smaller general cargo vessel needed to move two to three metres forward to allow the bulk carrier's forward crane to reach part of the cargo hold that was being loaded. The general cargo vessel's master decided to warp the vessel ahead using the mooring lines and tasked the watch crew and the chief officer. No additional crew members were assigned to the task, as the off watch crew was resting, while the master acknowledged that the chief officer was tired. An AB and the chief officer were posted on the general cargo vessel's aft mooring station, with the 3/O and bosun on the forward mooring deck. The SMS required an officer-led team of three crew at each mooring station for mooring operations, with the chief officer supervising. It was dark by the time the warping operation commenced and the bulk carrier's deck was about eight metres higher than the general cargo vessel, despite the vessels having had similar freeboards at the start of the loading operation, 22 hours earlier. As the bosun slackened the forward springs, the AB began to haul in one of the aft spring lines, with the chief officer standing close to the vessel's side and the aft springs. Both of these lines led through the same open design fairlead and as the tension increased on the spring, it skipped over the fairlead

and struck the head of the chief officer, who collapsed unconscious. Although the alarm was raised immediately, it took two hours until a medical professional could treat the injured chief officer, who was declared deceased.

Why did it happen:

- The mooring line sprang free because the fairlead in use was open and the lines had adopted a hazardous upward lead caused by the difference between the vessels' freeboards that had developed during cargo operations.

- Leading two lines through the same fairlead restricted the space available and almost certainly contributed to the mooring line springing out of the fairlead and snapping tight.

- The chief officer was struck on the head and fatally injured while standing in the danger zone close to the tensioned spring lines when the warping operation commenced.

- An insufficient amount of crew was allocated to the warping operation, as the off watch crew were resting and the master didn't want to disrupt their hours of rest.

- Both the mooring and warping operations were insufficiently planned due to a lack of time available and the crew's lack of familiarity with ship-to-ship dry cargo operations.

- The crew of the general cargo vessel was unfamiliar with the ship-to-ship transfer operation and there was no guidance for the activity in the SMS.

What can we learn:

- This accident highlights the importance of assigning sufficient crew to shipboard operations. In this case, two crew at the aft mooring station were not sufficient to safely conduct the warping manoeuvre, resulting in the chief officer placing themself in a position of danger.

- There is well-documented industry guidance for the ship-to-ship transfer of liquid cargoes, but the guidance for transfer of bulk cargoes was limited. There was no procedure in the SMS for the ship-to-ship transfer of dry cargo, nor for warping the vessel using the mooring lines. It is important that an SMS is comprehensive and provides guidance on the appropriate conduct of all operations that may be carried out on a vessel.

- Operations need to be properly planned, risks assessed and the subject of a safety brief before they begin so that all hazards involved can be identified and appropriate control measures put in place. In this instance, the risk of the spring line jumping out of the fairlead had not been appreciated and the warping operation not sufficiently planned. Furthermore, the effect of the change in relative freeboard that had developed during the time the cargo operation had been under way had not been considered.

- It is important to ensure that equipment is suitable for the intended operation and that crew have a good understanding of the limitations of the equipment.

Who may benefit:

All deck officers and ratings.

3 MAN-OVERBOARD

Very serious marine casualty: Fatality when crew member fell overboard from ladder

What happened:

In June, a gas carrier was transiting in the South Atlantic Ocean, bound for a Brazilian port. In the morning after handing over the navigational watch to the third officer, the chief officer tasked two crew members with carrying out painting work for the undersides of two separate stairway landings from the boat deck.

After the crew members had collected the required tools, they began the painting work using telescopic rods connected to roller-brushes. About an hour into the painting work, one of the crew members saw the other carrying a portable A-frame ladder to the boat deck.

Shortly after, the crew member who collected the ladder was seen sitting on top of the ladder carrying out the painting and then losing his balance when the ladder tilted, while the vessel was altering course. The crew member and the ladder fell overboard.

Man Overboard (MOB) procedure was carried out, with the assistance of a nearby fishing vessel. The lifeless body of the lost crew member was brought on board the vessel, and attempts to resuscitate them were unsuccessful.

Why did it happen:

The investigation revealed that the use of the portable ladder was not considered necessary for the painting work, when the crew members were assigned and briefed for the work in the bridge. The use of the portable ladder, as stated in the safety management system (SMS), required a risk assessment and a permit-to-work to be carried out before approved by the master.

However, the crew member had used the portable ladder without consulting anybody. Although provided with a stop-work authority card, the other crew member did not execute this authority, missing the opportunity to stop the use of the portable ladder.

The investigation also revealed that there was a difference in the understanding of the SMS requirement for the type of work activities to be entered in the "Change of Bridge Watch" checklist by the watchkeeping officers (the CO and 3O), resulting in the 3O not being aware of the painting work on the open-deck.

What can we learn:

- The importance of carrying out toolbox meeting and information highlighting the task that would be undertaken by the crew on board to be made available to the officer on watch, in particular, where the duty crew was involved with the task.

- The importance of crew members exercising "stop work" authority when they see a dangerous situation or unsafe act.

Who may benefit:

Officers, Crew and Ship Managers

4 OCCUPATIONAL ACCIDENT

Very serious marine casualty: Fatality when crew member disassembled valve under pressure

What happened:

In the early hours of September, while transiting south-westerly in the Indian Ocean for a Brazilian port, an ore carrier experienced an exhaust temperature anomaly from the main engine.

The engine crew subsequently assembled in the engine-room and emergency replacement of a fuel oil injector valve (FOIV) was initiated.

After the fuel oil high-pressure pipe had been removed from the engine cylinder cover, the fourth engineer and supervising engineer (second engineer) left the main engine to the spare parts room, while the third engineer (3E) was alone on the cylinder head platform.

Shortly after, a loud bang was heard and the 3E collapsed on the platform with the fuel oil injector valve (FOIV) and its securing nuts nearby. The 3E was bleeding from the right-side of his face with fainting pulses. Immediate first aid was given on board and the vessel deviated to the nearest port for shore medical assistance, but the 3E succumbed to the injuries before medical treatment could be provided.

Why did it happen:

The investigation revealed that the securing nuts of the FOIV were removed by the 3E while the engine RPM had not attained zero. The FOIV expelled from the cylinder cover with substantial force on to the 3E's face.

While the investigation team could not establish the reasons for the 3E's removal of the FOIV without waiting for the RPM to be zero, the investigation revealed that the engine crew relied on memory and observations on how the FOIVs were removed previously and with varied interpretations of the safety precautions stipulated in the engine manual.

There was also an absence of supervision in terms of task assignment(s) to the engine crew. The engine's data records retrieved from the main engine revealed that certain safety precautions were not carried out.

What can we learn:

- This incident iterates the importance of compliance with safety precautions, especially for a ship's engine where the omission of any steps can result in an undesired outcome for both the engine and personnel.
- The purpose of each safety precaution should be well comprehended, and verification processes be established to ensure that work is safe to commence.
- These can be achieved through appropriate checklist(s) as part of a permit-to-work system with enhance scope in training encompassing these safety precautions.

Who may benefit:

Shipping community, Officers, Crew, Ship Managers, Shore Technicians

5 DANGEROUS SPACE / FALL FROM HEIGHT

Very serious marine casualty: Fatality and injury when crew entered cargo hold

What happened:

A bulk carrier, alongside discharging coal, was requested by stevedores to provide additional lighting. The officer of the watch tasked two crew to complete the task. While entering the hold via the enclosed Australian ladder, crew 1 collapsed and fell to the bottom of the ladder. Crew 2, on witnessing this, entered the ladder trunking to provide assistance. He also collapsed and fell to the bottom of the ladder. A rescue operation was initiated and both crew members were recovered alive and, after a delay, transferred to hospital. Crew 2 recovered some time later but crew 1 succumbed – a post-mortem identified exposure to hydrogen sulphide as the cause of death.

Why did it happen:

Neither crew members considered themselves at risk of exposure to harmful or toxic gases when they started the task as the hold was open and almost empty of cargo. The officer of the watch did not foresee entry into a dangerous space, and was not present, so the atmosphere was not tested in line with the company's enclosed space entry procedures. Although the hold was open, the design of the Australian ladder's trunking meant that there was no natural ventilation of the space as cargo blocked the lower exit.

Despite delays in their recovery, both casualties were breathing when they were recovered to the deck but no medical assistance arrived to assist. They were eventually taken to hospital by car, significantly delaying access to medical care.

What can we learn:

Cargo holds are dangerous spaces and each cargo presents its own hazards. The importance of effectively communicating these hazards and conducting a thorough risk assessment cannot be overstated. Realistic drills can improve speed of casualty recovery from dangerous spaces, as assistance from shore may take time.

Who may benefit:

The shipping community.

6 OCCUPATIONAL ACCIDENT

Very serious marine casualty: Fatality when crew was lost overboard

What happened:

In September a container ship was under way from a port in the North Pacific Ocean en route to Mexico. Early in the morning, the bosun came to the bridge to take job orders from the chief officer who was keeping the 0400H-0800H navigational watch. The bosun could not find the chief officer and informed the master, who turned the ship around on a reciprocal course. The nearby coastguard was alerted for search and rescue efforts, which spanned till the next day to no avail.

Why did it happen:

Why it happened could not be determined with certainty. However, the marine safety investigation revealed that the company's SMS on bridge watchkeeping was not implemented as there was no lookout on the bridge with the chief officer. In addition, the established procedures for mitigating the risk of a single watchkeeper were not complied with, as the bridge navigational watch alarm system (BNWAS) had been switched off and the lookout had been rostered by the chief officer not to report for the watch.

What can we learn:

- The importance of BNWAS activated for the safety of navigation.
- The bridge to be manned appropriately at all times.
- The availability of a convenient avenue for the fleet personnel to report unsafe practices on board including solo watch during hours of darkness.

Who may benefit:

Shipping community.

7 FIRE

Very serious marine casualty: Fatalities when crew fought fire and abandoned the ship

What happened:

While en route, a 150,000 GT container carrier encountered a severe fire in one of the cargo holds. Self-sustaining decomposition of a Class 9 cargo caused smoke and fire to spread in the cargo hold. The cargo was carried in block stowage exacerbating and accelerating the decomposition process. The crew responded to the fire by cooling and subsequent release of CO_2. The response was however not successful, and the crew eventually abandoned the vessel. Four of the crew were not accounted for and declared missing, and another was deceased while being transported ashore.

Why did it happen:

As most of the evidence was destroyed by fire, it was not possible to conclusively determine the cause of the fire. However, one or more containers in the cargo hold containing sodium dichloroisocyanurate dihydrate (SDID) were compromised by self-decomposition of the SDID. The block stowage of the SDID further exacerbated the rate of reaction and heat production which resulted in an uncontrollable spread of the fire. The actual temperature at which exothermic decomposition is initiated is much lower than the values typically declared by the shipper, and the presence of free water and/or stowage of the SDID in large packages or consignments leads to further substantial depression of the onset temperature.

Given the susceptibility of SDID to exothermic decomposition in the presence of free water or impurities, serious consideration must be given to the prospect that the decomposition could be initiated as a direct result of the inherent properties of the cargo itself.

What can we learn:

Special Provisions (SP135) within the IMDG Code allows for the classification and carriage of SDID under Class 9 (UN no.3077), thus not recognizing the potential thermal instability of this material, possibly as a result of legacy carriage requirements recognized nearly 40 years prior. As a result, despite these secondary hazards, SDID was stowed under deck where the main fixed fire-fighting means in this area was CO_2, which is ineffective for tackling fires associated with such materials.

Noting the secondary hazards presented by SDID, which are not captured in the current provisions of the IMDG Code, the provisions in the IMDG Code would need to be reviewed. Fire-fighting response for SDID, an oxidizer, required the use of abundant water, which could not have been achieved promptly, given the existing statutory requirements for fire-fighting measures for container fires under deck.

Adoption of standards/guidance like those prepared by the American Bureau of Shipping (ABS) and DNV, as a risk-mitigating measure, should be considered. Regardless of when the amendments to the statutory requirements take place, dangerous goods with oxidizing properties such as SDID should be considered for stowage on deck, away from direct sunlight, where water could be used more effectively.

There was a delay in decision-making to allocate resources better for the abandoning of ship while attempting to fight the fire.

Who may benefit:

Seafarers, Flag Administrations, Recognized Organizations, Shipowners, Ship operators, Charterers, Shippers, Consignees, Salvors, Container terminals, SAR authorities, HAZMAT agencies.

8 FIRE

Very serious marine accident: ship total loss due to fire

What happened:

In June during cargo discharge operations while alongside a fire broke out in the internal cargo handling spaces of a self-unloading (SUL) bulk carrier.

The ship's crew initiated an emergency response but shipboard efforts to control the fire were ineffective. The fire soon established itself and spread to the exterior of the ship, setting the discharge boom on deck alight. The ship's crew were evacuated and shore fire-fighting services from ashore took charge of the response to the fire. The fire was contained and eventually extinguished about five days after it started.
The ship sustained substantial structural damage, including breaches of two fuel oil tanks, and key components of the SUL system were largely destroyed. The ship was declared a constructive total loss and subsequently dispatched to be recycled. There were no serious injuries or pollution of the sea reported.

Why did it happen:

The investigation concluded that the fire had originated in the vessel's C-Loop space and was likely the result of a failed bearing in the ship's conveyor system which created the heat necessary to ignite the rubber conveyor belt. The investigation also determined that the ship did not have an emergency contingency plan for responding to fire in the ship's SUL spaces and that there were technical failures of the ship's alarm systems during the emergency response to the fire. Furthermore, some aspects of the shipboard response likely aided the fire's development while others increased risk by removing shipboard capability.

The investigation found that the risk of fire in the vessel's C-Loop space was identified and documented by the ship's operators as being unacceptable about five years before the fire.

This risk rating was primarily due to the absence of an effective means of fire detection and fire suppression for the SUL system spaces. However, measures taken to address the risk were either inadequate or ineffective. Furthermore, the lack of adequate regulatory requirements or standards related specifically to the fire safety of SUL ships have been a factor in several fires, including the ship. The investigation also identified that the regulatory oversight of the vessel did not identify any deficiencies related to the safety factors identified by this investigation, or to the ship's inherent high fire safety risk and management of that risk. In addition, the investigation identified a safety issue related to the marine fire-fighting capability of the shore-based fire fighters as well as other safety factors related to the inconsistent conduct of ship's drills and the port's emergency response plans.

What can we learn:

The investigation into the fire has highlighted the inadequacy of fire safety regulations and standards for the cargo handling spaces on board self-unloading bulk carriers. The effectiveness of a shipboard response to a fire depends primarily on the ability to detect the fire at an early stage and quickly extinguish it at the source. Where it has been identified that the lack of such systems has resulted in the risk of a fire in a space being unacceptable, suitable control measures need to be implemented in order to reduce the risk to an acceptable level.

The introduction of mandatory minimum standards for suitable fire detection and extinguishing systems, to address the known high fire risk spaces of self-unloading bulk carriers, can significantly reduce the risk of major fires in these spaces. Additionally, the introduction of standards governing the fire resistance properties of conveyor belts used in shipboard systems can help reduce the likelihood of ignition in the first place.

Who may benefit:

Operators and crew of self-unloading bulk carriers and other vessels exposed to similar risks, State fire-fighting agencies, National maritime regulators, Classification societies.

9 COLLISION

Very serious marine accident: Vessel sinking after collision

What happened:

A bunker tanker was under way at night within port limits after completing bunkering operations with another vessel. As the bunker tanker was proceeding, the vessel's master sighted an unlit wooden coaster that was approaching on the bunker tanker's starboard bow. The bunker tanker's master sounded one long blast on the vessel's whistle just before the bunker tanker and wooden coaster collided. Neither vessel took any apparent action to avoid collision. At the

time of the collision, the bunker tanker's master was in charge of the vessel's navigation and radio communications. He was also serving as the vessel's helmsman. The chief officer was on the bridge making entries in the logbook. A dedicated lookout was not posted. The wooden coaster's Skipper was alone on the vessel's bridge. The bunker tanker's master immediately reported the collision to the port authority as the vessel continued en route to the anchorage.

The wooden coaster's hull was seriously damaged. After some period of time, the wooden coaster broke up and sank. All nine crew members on board the wooden coaster were rescued by a passing tug soon after. The bunker tanker suffered only scratches. There were no reported injuries.

The incident occurred in fair weather with partly cloudy sky and good visibility. The sea state was calm and easterly wind was light, less than five knots.

Why did it happen:

The investigation revealed that the wooden coaster was not manned by qualified crew, was equipped with non-standard navigational lights, did not have a radar reflector, and had not maintained a proper lookout.

The bunker tanker's master was navigating the vessel, serving as the helmsman, and conducting radio communications by himself. Further, a designated lookout was not posted and the master did not notice the presence of the wooden coaster until very near to the time of collision.

What can we learn:

- The importance of all vessels maintaining a proper lookout by sight and hearing.
- The importance of masters determining if a vessel involved in a collision may require assistance before continuing on a planned voyage.
- The need for all vessels to display required navigation lights from sunset to sunrise and between sunrise to sunset in restricted visibility.
- The importance of wooden vessels using radar reflectors to improve detection by other vessels.
- The importance of vessels being manned by properly qualified crew members.

Who may benefit:

Ship managers, watchkeepers, fishing vessel owners, seafarer training institutions.

10 MAN-OVERBOARD

Very serious marine casualty: Crew washed overboard

What happened:

A capsized bulk carrier, loaded to its summer draught marks, was on passage around the southern tip of Africa in May. In marginal conditions, the bosun and second officer were repairing a leak on the deck's fire main. Having completed the task, both crew members went for a coffee break. Shortly thereafter, work on deck was suspended due to the increased wave and swell height. After their break, the bosun and second officer went back on deck to collect their tools when an unusually large wave struck on the vessel's starboard beam and washed

the bosun overboard. A search and rescue operation was initiated, but the bosun was not recovered.

Why did it happen:

A heavy weather warning had been received that morning but had not been incorporated into the work plan – tasks on deck continued as conditions deteriorated. Guidance on heavy weather was not robust and did not include a threshold for what constituted heavy weather. The decision to stop work on deck was made in time but no additional protection was afforded to the crew who went on deck to secure the loose items in line with the heavy weather checklist. The vessel was loaded to its summer draught but was in relatively high latitudes in winter, just 13 nautical miles from the winter zone load line.

What can we learn:

When expecting heavy weather, a timely termination of all operations on deck is vital to ensure the safety of the crew. If the crew are required to go on deck during deteriorating weather conditions, a thorough risk assessment should be performed and effective risk reduction measures, such as adjusting course and speed, implemented. Personal protective equipment (PPE) such as a harness, safety line and a flotation device should be worn as a minimum.

Who may benefit:

The shipping community.

11 COLLISION BETWEEN GENERAL CARGO SHIP AND FISHING VESSEL

Very serious marine casualty: Fishing vessel lost

What happened:

In the afternoon, while navigating close to the coast, a coastal general cargo ship collided with a wooden-hulled fishing vessel in restricted visibility. The fishing vessel was severely damaged and sank while being towed to port. The cargo ship suffered minor damage. There were no injuries.

Why did it happen:

The vessels collided in fog because neither watchkeeper was keeping an effective lookout: the wheelhouse on board the fishing vessel had been left unattended and the officer of the watch on board the cargo vessel was distracted from lookout duties with administrative work. The general cargo ship did detect the fishing vessel on radar but, as it did not have a correlating automatic identification system (AIS) transmission, the bridge team tried to confirm the echo's validity visually, delaying the decision to alter course until it was too late. At the time of the collision, both were power-driven vessels as defined by COLREGs, neither was making the required sound signals.

What can we learn:

Navigation in restricted visibility requires heightened vigilance. Proper use of bridge equipment is crucial to provide an early warning of potential dangers with radar becoming the "eyes" of the watchkeeper. Reliance on AIS for ship detection can result in smaller vessels going unseen. Properly mounted radar reflectors help ensure wooden-hulled boats give good radar echoes on other ships' radar screens. Sounding of fog signals provides an additional means for detection in restricted visibility.

Who may benefit:

Ship managers, watchkeepers, fishing vessel owners, seafarer training institutions.

12 COLLISION CONTAINERSHIP AND FISHING VESSEL

Very serious marine casualty: Crew missing and fishing vessel sank

What happened:

An almost 2,000 TEU (twenty-foot equivalent units) container ship collided with a 31-metre fishing vessel on the high seas. The collision occurred during daylight hours in good weather with visibility of more than 5 NM as the container ship was passing through a group of fishing vessels that were all drifting. None of the fishing vessels were engaged in fishing. The fishing vessel capsized and sank. Two of the fishing vessel's crew members are missing. The container ship had minor damage. At the time of the collision, only the officer on watch (OOW) was on the bridge of the container ship and there was not a watchstander on duty on the fishing vessel.

Why did it happen:

- Neither the container ship nor the fishing vessel were maintaining an effective lookout as required by the COLREGs.
- Ineffective navigational watchstanding on board the container ship due to the OOW prioritizing other watchkeeping tasks over maintaining an effective lookout and collision avoidance.
- The fishing vessel did not have a watchstander on duty.
- Both of the container ship's radars were in standby and were not being used for vessel detection and collision avoidance even though both were operational.
- Over-reliance by the container ship's OOW on AIS information for vessel detection and collision avoidance.
- The container ship's OOW was alone on the bridge had not called the duty ASD to the bridge to provide assistance.

What can we learn:

- The importance for all vessels to maintain an effective lookout at all times.
- The importance of making use of radar, if fitted and operational, for vessel detection and collision avoidance.
- The danger of over-reliance on AIS information for vessel detection and collision avoidance.
- The dangers of prioritizing other watch keeping duties over collision avoidance.
- The hazards of one person watchstanding.

Who may benefit:

Ship managers, seafarers, fishing vessel owners, seafarer training institutions.

13 MAN-OVERBOARD

Very serious marine casualty: Crew fell overboard when rigging pilot ladder

What happened:

Prior to sunrise, a 51,500 deadweight (DWT) chemical/oil products tanker was preparing for arrival. At approximately 0515, the bosun and an ASD started rigging the combination pilot ladder on the ship's port side in order to embark a pilot. After they had lowered the accommodation ladder over the side, they noticed that the lower platform was not parallel to the water and needed adjusting. The ASD went down the ladder without wearing a lifejacket and safety harness with a lifeline attached to the ship as required by the shipboard safety management system. The bosun did not tell the ASD to return to the ship's deck when he saw him start down the accommodation ladder. In addition, the bosun did not inform the master or OOW that the ASD was going down the ladder. The ASD fell overboard while he was adjusting the lower platform of the accommodation ladder.

The bosun immediately informed the master and OOW that the ASD had fallen overboard. He then threw a lifebuoy overboard. Neither the master nor the OOW released the MOB lifebuoy from the bridge wing when the MOB was reported. The master then ordered the turn to starboard rather than to port, which increased the possibility that the ASD being struck by or forced under the ship's hull. The SAR operation did not find the ASD.

Why did it happen:

- Ineffective pre-task planning due to it being rushed and the attention of both the master (who was conducting the pre-task Toolbox Talk) and the OOW (who was the officer responsible for the planned task) being divided between navigating the ship and reviewing the procedures, required PPE, and relevant risk assessments with the crew members assigned to rig the combination pilot ladder.
- Not wearing a lifejacket and a safety harness with lifeline attached to the ship while working over the side.
- Ineffective supervision by the OOW of the bosun and the ASD while they were rigging the combination pilot ladder.
- Lack of communication between the master, OOW, bosun and ASD.
- Multiple crew members not identifying an unsafe condition.
- Inadequate preparedness of the Bridge Team for a MOB emergency.

What can we learn:

- To be effective, the attention of crew members participating in a pre-task Toolbox Talk cannot be divided.
- The importance of wearing appropriate PPE (e.g. lifejacket and safety harness with a lifeline attached to the ship) when working over the side.
- The importance of effective supervision by the officer or another crew member who is responsible for planned job or task and the crew members who are conducting it.

- The need for timely and effective communications.

- The importance of crew members being able to identify an unsafe condition and then taking action (e.g. exercising stop work authority) so that the situation can be addressed.

Who may benefit:

Ship managers, masters, seafarers

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