IMCA Safety Flashes summarise key safety matters and incidents, allowing lessons to be more easily learnt for the benefit of all. The effectiveness of the IMCA Safety Flash system depends on members sharing information and so avoiding repeat incidents. Please consider adding **safetyreports@imca-int.com** to your internal distribution list for safety alerts or manually submitting information on incidents you consider may be relevant. All information is anonymised or sanitised, as appropriate.

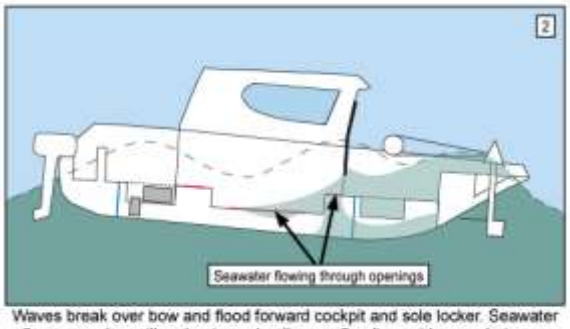
1 MAIB: Flooding and sinking of the survey workboat *Bella*

Applicable Life Saving Rule(s)

Bypassing Safety Controls

The UK Marine Accident Investigation Branch has published Report 10/22 into the flooding and sinking of the survey workboat *Bella.* The boat flooded and sank while carrying out hydrographic survey operations in coastal waters. The crew abandoned into the life raft and were rescued uninjured by a local boat owner; there was no pollution.

The full document contains much detail of interest to members who operate small boats, including some informative diagrams and illustrations, which for the sake of brevity has to be omitted here.



Waves break over bow and flood forward cockpit and sole locker. Seawater flows over door sill and enters wheelhouse, flooding void space between deck and hull moulding

What happened

The survey workboat was conducting inshore hydrographic survey operations in the approaches to Lynmouth, UK. In conditions of wind force 3 from the NW, and short, choppy 1m seas, waves started breaking over the bow, beginning to fill the forward cockpit area. The skipper turned on the electric bilge pump and reversed course to the south-east in an attempt to prevent further water ingress by running down-sea. Floodwater was, by then, flowing over the sill of the forward door into the wheelhouse and from there entered the void space beneath the wheelhouse deck.

With the boat sitting low in the water, bow down, the skipper realised that there was a danger of sinking so he stopped the engine and told the crew member to make a "Mayday!" call using the hand-held VHF radio. No response was heard to the VHF "Mayday!" call, so the crew member used a mobile phone to call the emergency services to notify the coastguard. Shortly after the emergency calls were made, and with the boat swamped and partly submerged, the skipper launched and manually inflated the life raft. As the boat was sinking, the skipper and crew member entered the sea and scrambled into the inflated life raft. Both were rescued shortly thereafter and were unharmed. Two weeks later, divers located and salvaged the sunken boat.

What went wrong

- This was a small open boat primarily designed for recreational use;
- She had been significantly modified for commercial surveying by the addition of a heavy gantry, winch and multibeam echo sounder. These modifications had reduced the boat's forward freeboard, increasing its vulnerability to flooding;

- In moderate seas, *Bella* shipped water over the bow that made its way into the wheelhouse and then into the void space between the deck and the hull. With no buoyant volume or in-built buoyancy, the boat was soon overcome and sank;
- Investigation identified weaknesses:
  - In the commercial certification applicable to the boat, which resulted in it being inappropriately certified as a workboat suitable for operations at sea, and,
  - In the owner's safety management system.

What was the cause

- The boat sank because it became swamped with seawater and had insufficient reserves of buoyancy or means of flotation to remain afloat;
- The vessel was vulnerable to swamping even in moderate sea conditions because the addition of the multibeam echo sounder gantry had significantly reduced its forward freeboard;
- Despite being issued with the necessary certification, the boat was not compliant with the Workboat Code; shortcomings in construction and means of flotation were missed during the certifying survey due to the surveyor's over-reliance on RCD documentation;
- The shore-based team almost certainly underestimated the risk flooding and swamping as they had no recent experience of operating in the open sea and had become accustomed to operating in sheltered waters with low sea states;
- The operator's operations manual was not an effective safety management system; shortcomings included underestimation of hazards associated with vessel modifications, operating conditions and crew qualifications;

What went right

- The two crew managed the emergency creditably and were fortunate to be rescued by local vessels soon after their boat sank. The wearing of PFDs and their familiarity with lifesaving equipment led to a safe and orderly abandonment.

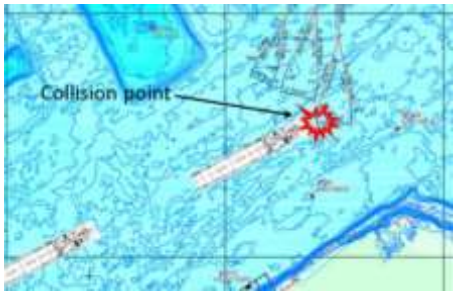
Members may wish to refer to:

- The Workboat Code Edition 2
- MAIB: Capsize and sinking of fishing vessel Joanna C – vessel stability

2 Vessel collision with underwater objects in harbour

What happened

A vessel suffered underwater damage to the hull when it collided with uncharted objects in the harbour. The incident occurred after completion of cargo operations when an AHTS vessel cast off from the quayside for departure. While proceeding towards the harbour channel and leaving the mooring buoys on its port side, crew on the vessel felt a blow to the vessel. Immediately the crew went to check for damage and found out the vessel was holed - seawater was coming in. The authorities were informed and the vessel returned to the quayside. The vessel had to be dry-docked for repairs.



What went wrong

The vessel collided with uncharted underwater harbour pilings.

What was the cause?

- There were no proper navigational markings - the piles were not marked with floating buoys;
- The most recently updated charts for the harbour, provided by the authorities six months before this incident, did not reflect the exact co-ordinates of the underwater piles;
- The pile height and the water depth information provided on the chart did not match the "under keel clearance" calculation done by the bridge crew on the vessel.

Additionally, our member noted that:

- There was a warning in place: a recent local notice to mariners was given with general coordinates for an area in the harbour without any coordinates identifying the underwater piles. The notice did warn all vessels to be "careful in this area" but did not restrict entry to it;
- Comparison of the coordinates where the collision took place, with underwater pile coordinates subsequently obtained by the company, confirmed absolutely that the vessel hit one of the piles.

What happened next?

- Bridge crew should calculate "under keel clearance" considering draft versus water depth, height of subsea objects, vessel stability, weather conditions and squat effects when navigating through a potentially hazardous area;
- If possible, avoid navigating through areas for which notices to mariners or similar warnings are in place. If there is no option but to do so, it may be appropriate to seek shore-side management approval.

Members may wish to refer to

- Vessel ran aground following error on chart
- Grounding and flooding of ferry – complacency (MAIB)
- Grounding of ro-ro freight vessel Seatruck Performance

3 Oil leakage from vessel crane onto quayside

What happened

A hydraulic pipe burst causing an oil leak. The incident occurred when a vessel was alongside retrieving anchor handling chains from chain lockers to the main deck. This operation had been ongoing for nine hours at the time of the incident. There was little or no adequate lighting on the quayside.

Applicable Life Saving Rule(s)

Bypassing Safety Controls

Safe Mechanical Lifting

During movement of the vessel's crane, the Bosun observed the wet stains of leaking hydraulic oil which had spilled on the surface of the quayside platform gratings and onto the concrete. The job was stopped, and deck crew started searching for the leakage source. The crew inspected the quayside to check for spillage.

Inspection taking place in poor light conditions – missing the leak

View of the spillage area in the morning

What went wrong

- During inspection it was discovered that there was a rupture in a hydraulic hose of the vessel crane.
- Though a search for leakage to the quay took place, poor lighting meant that the crew failed to notice any sign of oil spillage;
- There was a lack of compliance with incident reporting requirements - this incident was initially left unreported by the vessel crew;
- It was subsequently discovered that the crew were unaware of the requirements to report any releases or spills to the environment.

What was done next

- Ensure crew properly understand the need to report any releases or spills to the environment;
- Ensure planned maintenance of hydraulic hoses – regular visual inspection to be instituted, and regular and immediate renewal of hoses based on their physical condition.

Members may wish to refer to

- LTI – rigger tripped over quayside obstacle in the dark and fell
- Pollution caused by burst hydraulic hose (2005)
- Failure to report hydraulic leak subsea

4 BSEE: A note on repetitive strain injuries

The United States Bureau of Labor Statistics (BLS) has published Safety Alert 451 relating to Body mechanics, (manual) lifting techniques, and repetitive motion leading to strain injuries. The BLS tracks occupational injuries, illnesses, and fatalities in the United States on an annual basis. Sprains, strains, and tears are categorized as Musculoskeletal Disorders (MSD) for these statistics. The BLS noted that in 2020, MSDs were a leading cause of non-fatal occupational injuries, with 157,290 cases attributed to strains alone.

A strain occurs when a muscle or tendon is stretched or torn. The number of MSD injuries is increasing in frequency throughout the Gulf of Mexico Region. Most of these MSDs were due to repetitive motion, overexertion, and awkward lifting and pulling techniques.

Recent injury due to excessive force and awkward body position (this is a re-enactment)

What happened

The following are incidents BSEE reviewed that occurred in the last five months, for your awareness:

- A mechanic using a breaker bar to loosen a nut sustained a strain injury in his right shoulder;
- While testing blowout preventers, an operator was in the process of closing a plug valve with an extension handle and sustained a strain injury in his lower back;
- An electrician was bending over to move batteries inside a Supervisory Control and Data Acquisition (SCADA) battery box and sustained a strain injury with muscle spasms in his lower back;
- An individual reported to the medic with the complaint of feeling a "pop" behind his left knee while transitioning from a stairwell onto the drilling deck.

What were these people doing wrong?

The Safety Alert notes that *the potential for strain injuries can be reasonably anticipated as associated hazards are present in the offshore work environment. Steps can be taken to mitigate the risks for strain injuries. The two most applicable contributing factors are Ergonomics and Individual Risk Factors:*

- *Ergonomic Risk Factors include excessive force loads on the human body, extreme repetition, and awkward posture. To mitigate the risks associated with ergonomic hazards, engineering and administrative controls must be appropriately evaluated;*
- *Individual Risk Factors include poor work practices, overall health habits, rest and recovery, and nutrition and fitness. To mitigate the risks associated with individual risk factors, employees should be trained in all aspects of human performance and ergonomics. Additionally, implement early intervention processes to recognize MSD early warning signs to prevent them from developing into an injury.*

Putting ergonomic and administrative controls in place, to reduce the risks associated with MSD injury hazards, is part of the company's responsibility to provide a safe workplace for its people.

9% of IMCA members reported LTIs for all time are caused by muscle stress and repetitive strain - https://www.imca-int.com/data/safety/

Members may wish to refer to:

- IMCA short video on manual handling: Manual handling – IMCA (imca-int.com)
- OSHA's ergonomic guidelines: https://www.osha.gov/ergonomics
- OSHA's Sprains and Strains in Construction/Pulling Cables video
- Injuries sustained during maintenance – worker positioning
- Everyday activity, unwanted outcome: Poor manual handling leads to back strain

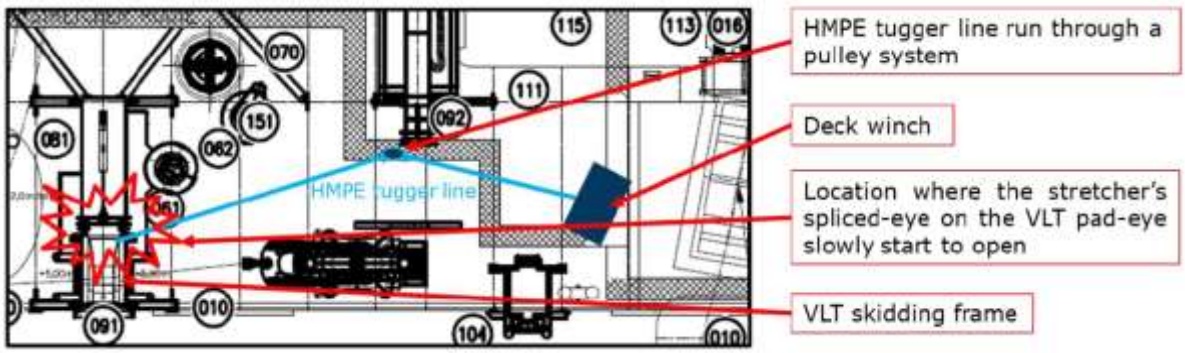
5 Connection failure during lifting operation

Applicable Life Saving Rule(s)

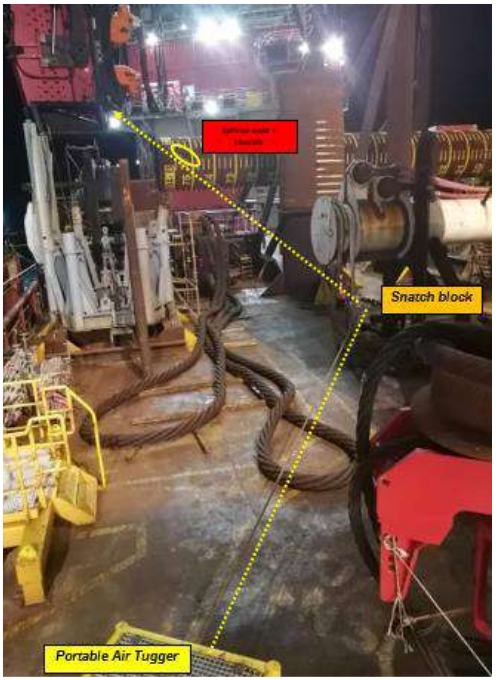
Safe Mechanical Lifting

What happened?

On a windfarm installation vessel, there was a connection failure during operations. During lowering and rotating of the Vibro Lifting Tool (VLT) into the skidding frame for the pile upending process, the spliced-eye connected on the VLT pad eye slowly opened up. The tugger line sprung toward the winch with low energy and fell on the deck. There were no injuries.



To guide the equipment onto the skidding frame, a tugger line was connected to the VLT by means of a self spliced-eye. The tugger line was made of HMPE (High Modulus Polyethylene) spooled on the dedicated deck winch.



What went right

An exclusion zone had been established and personnel involved were not in the line of fire. The Vibro Lifting Tool was already inside the guide of the skidding frame and the insertion of the VLT could be completed without consequences.

What went wrong

The incident investigation could not identify the exact root causes, however the following causes have been considered as contributing to the event:

- Amount of force applied to the tugger line;
  - The tugger line arrangements/connections weren't engineered
- Quality of the tugger line splice:
  - The spliced eyes were prepared on board by the crew;
  - Written instructions from the manufacturer for a high performance splice of a 12 strand rope was available on board;
  - The crew experienced in splicing could not demonstrate having received formal training;
  - The quality of the splice wasn't checked against the written instruction;
  - The splice was covered with duct tape and therefore impossible to inspect and to notice any partial damage/excessive wear/fatigue;
  - The spliced-eye was choked on the VLT's pad eye without use of a shackle, resulting in a small bending radius where the fibre rope is wrapped around the edges of the pin hole and pad-eye plate increasing the risk of damage to the rope and the spliced eye.

Our member took the following actions:

- Ensured that splices are only made by competent, qualified and trained personnel;
- Ensured crew were aware that the Maximum Breaking Load (MBL) of a tugger line is reduced by applying a spliced-eye;
- Splices in general should not be covered by tape as it prevents regular visual inspection, use the original equipment manufacturer protection covers instead;
- Spliced ropes should be part of the vessel maintenance regime as per manufacturer's instructions;
- Avoided the choking of tugger lines, using suitable shackles instead.

Members may wish to refer to

- Failure of steel wire sling
- Main ROV lift wire umbilical and bullet parted