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Single Points of Failure



Adam Parnell
Director (Maritime)

Welcome to the Spring edition of FEEDBACK, our free safety newsletter for the global maritime community. We're delighted to report that we're now publishing in Arabic as well as the other seven existing languages, all of which can be found on our website or via our mobile app, which you can download using the QR codes printed on the back page of this newsletter.

Readers will detect that all of the reports in this edition share a common theme: single points of [safety] failure. Whether it is the pilot who undertakes the burden of night navigation unaided, the rope through which every fender on the ship's side is secured, or the single safe walkway to the forecabin which gets blocked by the timber cargo stored on deck, recognising and addressing potential 'single points of failure' greatly reduces the risk of an incident occurring.

As ever, CHIRP publishes these reports to raise awareness of the safety learning that arises from these incidents, and where possible, we always try to highlight simple and practical safety measures that you can implement in your daily routines. In this edition, we encourage you to adopt the PACE (Probe, Alert, Challenge, Emergency) system, which improves group decision-making. You can also read a fuller description in our Making Critical Decisions at Sea publication (available on our website under the 'Resources' tab). Let us know what you think about this system - we'd be delighted to hear if this helps you and your teams on board. And we're always keen to receive your incident and near-miss reports that help others learn from your experiences too.

Until the next edition – stay safe!

Recognising and addressing potential 'single points of failure' greatly reduces the risk of an incident

Are you interested in becoming a CHIRP Maritime Ambassador?

CHIRP and the Nautical Institute have an established ambassador scheme to raise awareness of our incident reporting schemes and encourage the submission of incident, accident and near-miss reports.

As an ambassador you will join an international network of seafarers

who also share your passion for safety, and you will quickly gain a broad knowledge of current safety issues. These are great additions to your CV and increase your employability.

Together we can promote the development of a 'just' reporting culture across the maritime sector

to improve safety outcomes. The key attributes of a successful ambassador is a passion for safety and a willingness to speak up for CHIRP among your colleagues and contacts.

If this sounds like you, please contact us to discuss this opportunity at mail@chirp.co.uk



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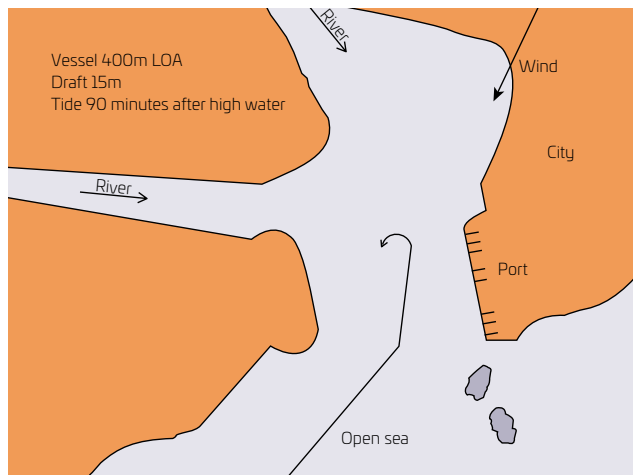


Android:



M2100

Vessel grounding in harbour



Initial Report

The pilot boarded a very large container ship at 0200 before it navigated into harbour. The wind was NNE 10 knots, the tidal current was to the SE, and visibility was good. The pilot noted after the incident that language difficulties reduced the effectiveness of spoken communication.

At about 0350 (1 hr and 30 mins after high water), the container ship commenced her swing to port off the berth. By 0405, with the swing completed, the vessel appeared to be setting south under the influence of wind and tide.

The vessel's stern swung towards the quay and got close to one of the jetty cranes, so the pilot manoeuvred the vessel to avoid contact. They needed someone to report distances to the quay and other infrastructure as it was less than 10m from the jetty and a mooring dolphin. Three tugs were directed to pull the container ship away from the jetty, but it became apparent that the vessel had drifted due to wind and tide and had grounded on a charted shallow patch. The port authorities were informed, and a fourth tug was despatched

to push onto the vessel's port quarter. With this assistance, the ship safely manoeuvred off the shallow patch at 0506 and subsequently berthed without further incident after extensive checks on the hull's watertight integrity.

CHIRP Comment

Maintaining situational awareness at night is challenging. Visual references are difficult to make out, particularly against background lights, and they can change over time due to development ashore. IMO SOLAS Chapter V regulation 13,

Establishment and operation of aids to navigation should be reviewed for each port as the volume of traffic justifies and the degree of risk required

As part of the assessment, port authorities must consider whether their navigation aids are sufficient to enable safe navigation, including appropriate lit aids to navigation if the port is open at night. To determine which aids are required, countries and port authorities must conduct risk assessments of their ports. IALA guidance (G1124) provides a guide to safety assessment.

The briefing between the pilot and crew was hampered by language difficulties. The pilot became the 'single point of failure' as a result. A sketch or other visual aid would have helped develop a common understanding, making it easier to identify when the pilot needed assistance and to prompt constructively or question, e.g. "Are you aware that we are drifting towards the shallow patch?" This did not happen. As the vessel moved close to the jetty and other objects, the pilot's workload focus increased, and they lost overall situational awareness.

CHIRP strongly encourages teams to adopt the PACE (**P**robe, **A**lert, **C**hallenge, and **E**mergency) described in some depth in the CHIRP publication 'Making critical decisions at Sea', which is available on our website. Good communication and attention are essential, particularly at night when our circadian rhythms are often at their lowest.

CHIRP draws your attention to the enormous forces acting on the underwater hull of very large vessels. Masters



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responsible for safely navigating very large vessels should be provided with adequate training in handling these large vessels so that they can, with enhanced knowledge, assist the pilots in safely berthing the vessel.

There are a number of manned-model courses which train masters and pilots in understanding the dynamic forces acting on the hull of all types of vessels.

Factors identified in this report

Communications – The bridge team should have affirmed the pilot's actions when requested. A drawing of the intended plan would have provided a visual interpretation of the stages of the turn with safe clearing distances applied to the radar for cross-checking.

Alerting – Only the pilot appeared concerned about the vessel's movement towards the corner of the jetty. The pilot stated he was acting alone- does this happen on your ship? Do you provide the support the pilot needs?

Fatigue/Situational Awareness – It's possible, given the time of day, that elements of fatigue were apparent. Berthing or unberthing at night requires enhanced situational awareness of yourself and your surroundings. Actively seek input from others.

M2099

Unsafe fendering arrangement for Ship to Ship Operations

Initial Report

Our reporter sent a photo of a storage ship with incorrectly rigged fenders, noting that a failure of any of the fender's securing lines will lead to a failure of the complete fender protection system.



CHIRP Comment

The rope is a single point of failure – if it breaks, the entire fender arrangement is compromised. Good seamanship demands that each fender is individually secured in position since the relative motion of vessels can cause the securing lines to part.

Factors identified in this report

Overconfidence – The operator may be too overconfident in the ability of the fender to provide a secure arrangement for both vessels, given the environmental conditions.

Local practices – This may be a local practice. However, in all ship-to-ship operations, both masters are responsible for ensuring that the mooring is secure throughout the loading/discharge operation. Would you challenge this fendering arrangement? Would you abort the berthing?

Alerting – Would you alert the master of the export ship with the fenders that the securing arrangement is inadequate?

M2095

Loss of steering control on a bulk carrier approaching a berth

Initial report

The master-pilot exchange was completed with no defects or limitations recorded. A tug was made fast aft on the centre line before arrival at the harbour entrance.

The pilot altered to starboard at the entrance to the harbour in accordance with the passage plan, but no counter helm was applied, and the ship continued to swing to starboard. The pilot gave a positive order of hard to port, and at this point, the helm indication was showing hard to starboard. The bridge team reported to the pilot that the ship had lost control of the steering. There was no audible alarm on the bridge to indicate any defect or loss of control of the steering control system.

The engine was immediately stopped, and the tug was ordered to pull back easily to arrest the ship's headway which was reduced from 4.2kn to 0.4kn.

The master re-established control of the rudder in Non-Follow Up (NFU) mode, and the rudder was bought back to midships. With the ship in a safe position in the harbour, the master and engineers reported that the defect had been rectified. The pilot instructed the master to thoroughly test the steering gear system before proceeding to the berth. When completed, the vessel was berthed safely.

CHIRP Comment

This report is an example of a good safety culture in action. As a result of a comprehensive risk assessment that included contingency planning, the tug was ordered and made fast astern. The master-pilot exchange allowed the pilot to integrate quickly into the bridge team, and they acted as one team during the incident.

Depending on the nature of the breakdown, an audible alarm may not sound, and the rudder indication is the most reliable indicator of a breakdown occurring. This was quickly detected by an alert bridge team, and the pilot could reduce speed by ordering the stern tug to take action. Once the engineering team reported that the problem was fixed, the

bridge team carried out confirmatory checks, and the vessel continued safely alongside

Factors identified in this report

Culture – Are you confident that the safety culture on board your vessel is similar to the one demonstrated here?

Communications – Because the communications were so good, even the outstations (engine room, tug, and parts of ship) were aware of what was going on and what they had to do. This is an excellent example to follow.

Teamwork – The pilot, master, bridge team, engineers and tug crew all operated in harmony because they had a shared mental model of the issue and the actions required. The pilot's insistence that the entire steering control system is tested before berthing was correct. The port authority should be commended for adopting this thorough approach to risk mitigation.

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M2082

Fouled Towing Line Bridle

Initial report

Our reporter stated they were on a tug, towing a 47ft tender and approaching the anchorage in the early morning (0130 hrs).

"There were just three crew on duty: me, the master, and the engineer. About a mile offshore, the master reduced speed to prepare for unhooking the tender. He directed me to the aft deck and to stand by. I started to put out fenders, ready for the tender to come alongside after anchoring. As I was doing this, I heard the engines go astern. The tender was only about 40m astern using a 75m tow line, and the tow line was slack. I radioed the bridge to say disengage/neutral, but it was too late.

The port end of the tow bridle got wrapped in the starboard propeller, and the engine shut down. We were drifting away from land, which was too deep to anchor. I put a mask on with a dive light and entered the water to assess what had happened. The tow line had gone through the middle of the rudders and, fortunately, had not damaged the propeller shaft or rudder. The towing bridle was, however, bar-tight and had to be cut off. I alerted the other dive master to assist me, and we went under the hull and cut the line off the propeller. This took about 10 minutes to complete.

Once we had re-positioned and anchored, I spoke with the captain about what had happened. He said he looked into the stern-facing camera when he was in neutral. He saw the tender approaching and thought that we were pulling it in, so he gave the tug a kick astern to assist with retrieval. He was unaware that the bridle was already slack in the water. None of this was communicated until after I shouted to go into neutral.

Our usual procedure is to have a minimum of two people astern and constant communications. We were ten days into a charter, and everyone was very fatigued. The captain was well over his hours. The fault lay on both sides: I should have radioed the captain and said I was sorting the fenders first. He assumed I was standing by but didn't confirm or ask if it was okay to come astern. We were fortunate!

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CHIRP Comment

A work operation such as this is risky at any time, especially in the early morning. A toolbox talk beforehand would have ensured that everyone understood the plan.

A risk assessment and comprehensive brief were required for this work, and all underwater equipment and inlets/outlets were correctly and appropriately isolated with a LOTOTO system.

Carrying out work in darkness and in the early hours when everyone is tired increases the risk of a mistake. Getting rest before carrying out this work in daylight with all crew available to assist if anything goes wrong is a much safer alternative.

Factors identified in this report

Fatigue- Early morning activities are always difficult, especially if crews are already fatigued, and decision-making can be affected. Could this operation have been timed for daylight when the crew could be better rested?

Communications- Establishing communications before the activity commences is essential, and for safety-critical tasks such as this, closed-loop communications are the safest method.

Teamwork- Teamwork in small teams usually works very well, but in this case, it broke down. This is a reminder that from time to time, even on very well-run vessels, we all need to check on each other to ensure everyone knows what is happening.

M2088

Pressurised to make a fatal decision

Initial report

The superyacht was anchored in a bay where jet skis had been prohibited due to the density of traffic in the anchorage and a spate of previous incidents.

The owner was on board with a fellow guest who drank heavily. They requested that the jet ski be launched. The captain explained that using jet skis was prohibited and ill-advised when inebriated. The owner and his guest were insistent, and this conversation escalated until the

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captain was given the ultimatum of either launching the jet-ski or being dismissed.

The captain yielded to this pressure, and the jet ski launched. Shortly after, the owner's guest had a high-speed collision with a nearby vessel. The casualty was recovered from the water, unconscious and severely injured; the crew found he was not breathing and commenced CPR, but the casualty died before emergency services arrived.

The result was one death, a traumatised crew and owner, and the captain losing his job. He remained out of work for the following two years while under investigation and under the threat of criminal prosecution.

In my experience, Superyacht owners are often unreasonably demanding and need to respect the captain's command. Being told "no" is unfamiliar to them and seen as an insult. Captains who stand their ground risk being side-lined for their professional conduct, and those that do yield to such demands potentially face even more dire consequences.

CHIRP Comment

The drink had clouded the judgement of the guest and the owner, but the captain knew that jet-skiing in the bay was prohibited. Even if the owner had sacked the captain on the spot, once they had sobered up, they would most likely have realised that the captain was speaking objectively, not subjectively. However, even when it could place others in danger, it can still be hard to refuse a request or order by an owner, particularly if they are used to getting their way or see refusal as a challenge to their authority. In this instance, the owner bullied the captain into launching the jet ski against their professional judgement. However, a captain's first duty is the safety of crew and passengers, and they should have refused, no matter the circumstances.

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To avoid such scenarios, captains are encouraged to confirm with the vessel's owner that they are empowered to refuse requests that put people or the vessel at risk of harm – and, crucially, that they will be listened to. Ideally, this should be done as early in the professional relationship as possible – potentially even at the interview. Shrewd owners will accept that the captain is looking after their interests. Where such assurances are not forthcoming, this should be a 'red flag' to the captain that safety on board is at some point likely to be compromised. Better to seek alternative employment at that point than find oneself being threatened with the sack in the heat of the moment. CHIRP wants to state that the master has other places to report this coercion, which should be made known to the master.

Factors identified in this report.

Fit for duty: Drink had impaired the judgement of both the guest and the owner.

Pressure/culture: The owner bullied the captain into going against their professional judgement. On board, such behaviour was reflected in the safety culture (and probably the welfare culture).

M2101

Unsafe access for the crew on a logger

Initial Report

Our reporter sent photos of a vessel loading timber cargo over alternate deck hatches. The timber extended right across the width of the deck, and the crew had to either walk on the narrow tops of the bulwarks or swing outboard of the log stanchions and hang over the side of the vessel. Both methods are unsafe. The pictures show the height of the "log face."

This is a lethal accident waiting to happen.



CHIRP Comments

We have previously reported on deaths that occurred on vessels loading or unloading timber cargos on deck, as well as our thoughts on the shortcomings of the Timber Deck Cargo Code because it does not mandate safe access to be retained at or below deck level. This has safety implications

for routine and emergency access (e.g., fire-fighting and med-evacuating a crew from the top of the logs). And although the vessel's design does not technically breach the Code (which presumably is why its Flag and Classification Society signed it off), the crew safety implications were not sufficiently thought through.

Whether climbing outboard in this manner is an unofficial 'local practice' caused by the lack of operational leadership on board or is implied by the company's Safety Management System, it is exceptionally dangerous and must cease. CHIRP is keen to see the Canadian regulations (which mandate that proper safe accessways for the crew and stevedores) be adopted more widely.

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Factors relating to this report

Local Practices – Clambering outboard to get around cargo stored on deck is never acceptable, and every seafarer should challenge this practice wherever it is encountered. Do not put your life at risk in this way.

Culture – The company's safety culture is weak if this is the approved method to traverse the ship.

Capability – Does the shore management lack the resources to properly audit log-carrying vessels to ensure that access is safe for the crew? If your ships carry logs, how do you ensure safe access?

M2103

Workload distractions lead to a high-speed collision

Initial Report



As a Crew Transfer Vessel (CTV) was returning to port at high speed, the master became distracted by a lengthy radio conversation and did not notice that the vessel had been pushed off course by the tide. It collided with a wind turbine tower at speed, causing significant damage to the vessel. The weather and visibility were good. As is common for vessels of this length, only the master was on the

bridge; nobody else was keeping a lookout during the radio exchange.

CHIRP Comment

Unfortunately, this is not an isolated incident: CHIRP is aware of several incidents where vessels collided with charted objects when the sole person on the bridge became distracted by workload.

Single bridge manning is common, particularly on small to medium-sized vessels by day in good visibility. However, manning requirements must always be informed by rigorous risk assessment. In the case of single bridge manning, extra care should be taken to ensure that the risks of workload, fatigue, distractions and other factors are adequately reduced to as low as reasonably practicable. The routine nature of this type of operation can lead to low mental arousal and risk distraction. This 'risk normalisation' reduces concern and can lead to overconfidence.

CHIRP was unsure if the ECDIS was working and correctly configured and could not determine from the report if any warning was sounded or heard.

Consideration should be given to increasing the number of lookouts during high-speed transit operations. Utilise your crew to highlight perceived hazards in the wind farm zones and use all navigational aids to assess the risks, especially on the chart plotter (alarms for off-track limits/cross-track error and radar guard zones).

Management should consider conducting a thorough risk assessment for vessels under their management using an independent auditor to determine the risks and set appropriate levels of manning for critical stages of a CTV operation.

Factors identified in this report

Situational Awareness – The master did not notice that the CTV had drifted off track. The offshore sector is a challenging and busy environment. What steps does your company take to ensure that this incident could not happen?

Capability – Is the resource capability adequate to ensure that safe navigational capability is maintained? The wind farm industry is relatively new, and an assessment of the risks associated with maintaining and servicing the wind turbines should be considered for review.

Distractions – Maintaining focus on a repetitive job is challenging. Having a lookout in place changes the dynamic interaction on the bridge, which can lead to a greater focus on hazard awareness.

M2102

Caution: short-cuts can bite!

Initial Report

The engineer on a fish processing vessel needed to conduct maintenance on a conveyor belt used for moving boxes of fish. When work on the processing deck was temporarily stopped for a crew break, the engineer activated the

emergency stop so that the conveyor belt would not be reactivated while they worked on it. They should have informed the crew of their maintenance intentions.

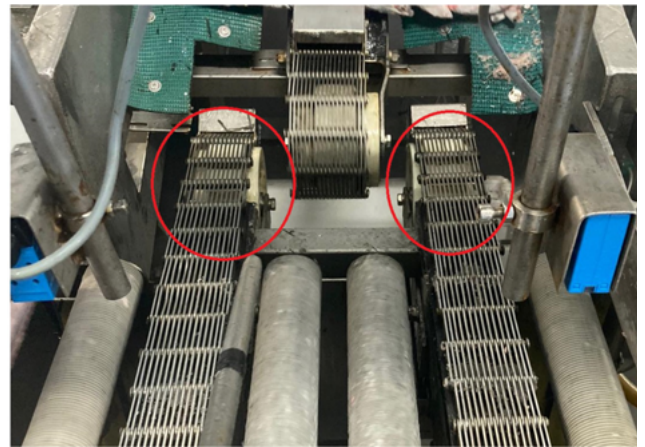
After the coffee break and once processing had restarted, the engineer wanted to check whether the tension on the chain was correct. While the engineer was checking the chain's tension by hand, an approaching box of fish activated a sensor that instantly switched on the conveyor belt, causing the sprockets and chain to start moving. The engineer's startled reaction was to pull their hand back because their fingers were trapped under the belt, tearing off part of a fingertip.

CHIRP Comments

The engineer failed to isolate the system completely and thought activating the emergency stop would prevent the system from operating. CHIRP contacted the company and received very positive feedback on how they would ensure that this type of incident would be prevented from happening again.

CHIRP was informed that the risk had been identified in the risk assessment for this work; it did not include Lock Out, Tag on, Tag off (LOTOTO) procedures which were only available for work on electrical systems and not on equipment with moving parts. The company have made changes to include this safety procedure for all equipment with moving parts.

Everyone must be briefed on planned maintenance work at the daily work planning meeting to ensure that conflicting work activities can be rescheduled and that adequate time and resource is allocated to the task. Because no one else was aware of the engineer's intentions, the incident outcomes could potentially be even more severe.





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The Medico Guide is very comprehensive and easy-to-use that will assist all seafarers and the Master with getting the proper treatment for an ill or injured seafarer, including a telemedical assistance service (TMAS) which provides free worldwide contacts to access qualified medical personnel for advice.

Factors relating to this report

Communications – Does your vessel have daily and weekly work planning meetings and is the work communicated to the rest of the crew? Would you display a notice board showing daily and weekly work activities?

Pressure – Self-imposed time pressure led to shortcuts being taken. Planned maintenance should not be rushed.

Design – It should have been impossible for the conveyor to restart until the emergency stop button was reset. Emergency cut-off systems are not an acceptable alternative to the established pre-work isolation routines.

Everyone must be briefed on planned maintenance work at the daily work planning meeting to ensure that conflicting work activities can be rescheduled

M2092

Near miss during lifting of a tender

Initial Report

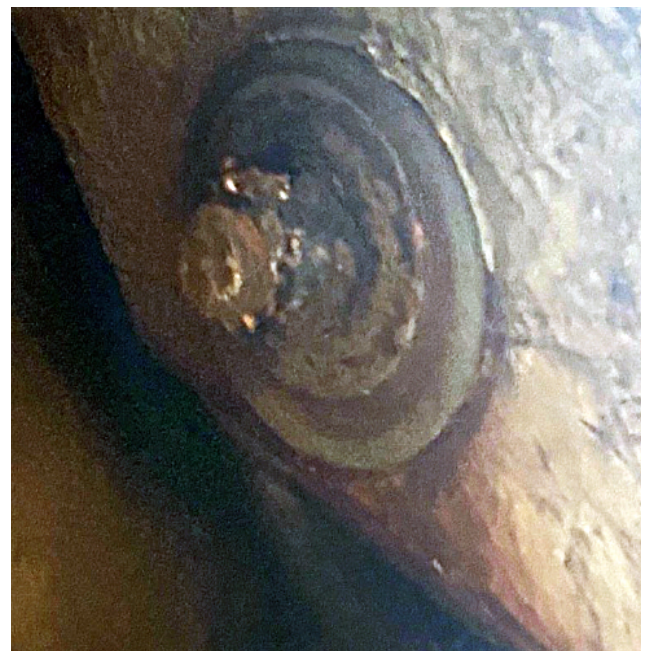
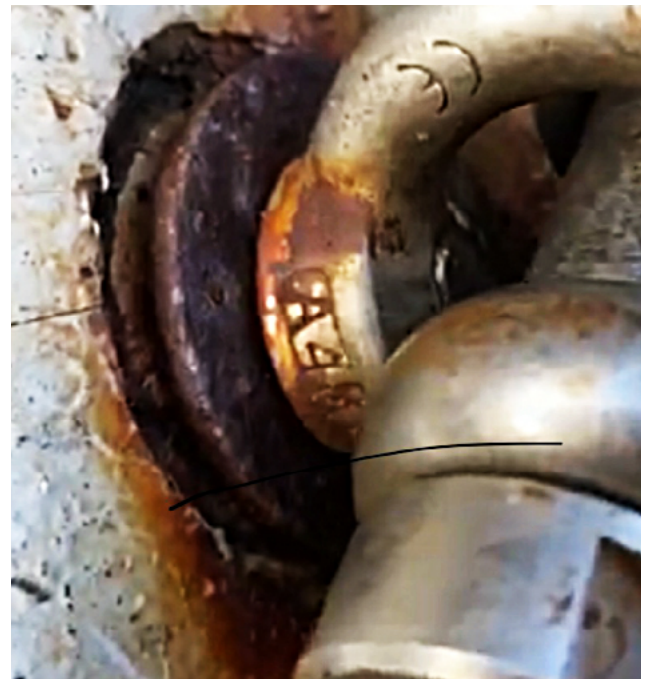
While lifting a 9m tender into the garage, the forward lifting point gave way. Luckily, at this point, the tender was over the chocks and dropped about 30cm into position, causing only minor damage. A crew member was inside the tender but was not injured.

Lifting points were tested annually and visually inspected regularly, but due to the design, the underside of the lifting point was inaccessible, and any corrosion was not visible.

The lifting point was rebuilt and strengthened, and an inspection hatch was made. The vessel's SOPs were amended, so that crew members attach the crane hooks to the lifting points, exit the tender before it is lifted, and only enter the tender once in the water.

CHIRP Comment

The report is positive: many safety improvements were made, and the vessel is to be commended for its positive safety culture. The equipment's design hampered the inspection of the underside of the lifting equipment. Often, we dissuade ourselves from raising safety reports on poorly designed or installed equipment in the belief that they are 'too big to change' or 'it must be right – it was built that way'. But even naval architects sometimes get it wrong, and if it had been reported, it could have been rectified when next in refit. Do not be afraid to report and record concerns about design deficiencies. Organisational safety management systems operate on a cycle of continuous improvements, and ship designers will be only too glad to receive feedback so that improvements can be made.



Useful references that detail the examination and inspection regimes for lifting equipment include the UK MCA's MGN 332(M+F) Amendment 1 and the Cayman Island's Shipping Notice 04/2021. Additionally, UK MGN 560(M) sets out the SOLAS III/36 requirements for launching appliances; these must be adhered to if the tender is also classified as a lifeboat or rescue boat. Accompanying an inspector during a thorough examination is a good learning opportunity: watch what they check for and ask questions.

Factors identified in this report

Safety Culture – The swift rectification of these defects indicates a positive safety culture on board. On this vessel, the crew can be confident that their safety concerns will be listened to.

Alerting – If you see something wrong – speak up. Just because it was built that way does not mean it is correct!

Design – Readers are encouraged to be constantly vigilant to poor design and to feed this back to designers and architects who often do not have to work with the equipment they develop.

M2110

Lithium-ion Battery Fire

Initial Report

During recreational activities for the passengers, one E-foil jet ski stopped due to the battery running low while in use. It was decided to take the E-foil back to the yacht to replace the battery with a fully charged one.

The run-down battery was taken out and placed on the deck in the beach club and replaced with a fully charged one. 30 secs later, the used battery which had not been plugged in to commence charging, started smoking, and 3 secs later erupted into flames. The fire was extinguished in minutes using the installed hi-fog system and a fixed fire hose. The hi-fog automatically went off when two fire detector heads went into alarm.

A team wearing breathing apparatus went in after the flames were extinguished to retrieve the battery and ventilate the space before it was deemed safe to enter.

CHIRP Comment

The team handling the change of battery were very observant and acted swiftly to control the fire in its early stages, and the vessel should be praised for installing a hi-fog system and a fixed fire hose system as well as the

response by the BA team. Clearly, there is a very good safety culture on board reinforced by good training of the members.

The leisure industry is using many more items of equipment that use lithium-ion batteries, so it is incumbent on all of us to better understand the hazards associated with their use.

Their unpredictable nature is a real cause for concern. CHIRP would like to understand in more detail why these batteries can be prone to spontaneous ignition and a thermal runaway reaction.

The thermal runaway occurs when the battery expels toxic gases, which ignite, rapidly increasing the temperature to a very high level.

It is thought that this can be brought about by the mechanical stress of the battery, heat stress or electrical stress, which can occur when overcharging the battery.

CHIRP feels that it is safe to say that good quality batteries which are properly looked after and taken out of service at the end of their life, should ensure that self-ignition is minimised or eliminated. CHIRP would welcome more reports on incidents involving lithium-ion battery fires.

Factors identified in this report

Culture: Excellent safety culture demonstrated by the boat crew – Does your organization have the same standards of equipment, training and response?

Local Practices: How thoroughly do you look at the procurement of batteries used to power your sports equipment? Do you have procedures for charging and disposal of the batteries?

Alerting: Are your members alerted to the potential hazards of lithium-ion battery incidents? Do you have a suitable training programme in place to mitigate the risks of a fire?

The leisure industry is using many more items of equipment that use lithium-ion batteries, so it is incumbent on all of us to better understand the hazards associated with their use



Images used are not the actual make or model referred to in the report

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