Safety Flash

04/22 – February 2022

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 Equipment on quay damaged when vessel started listing

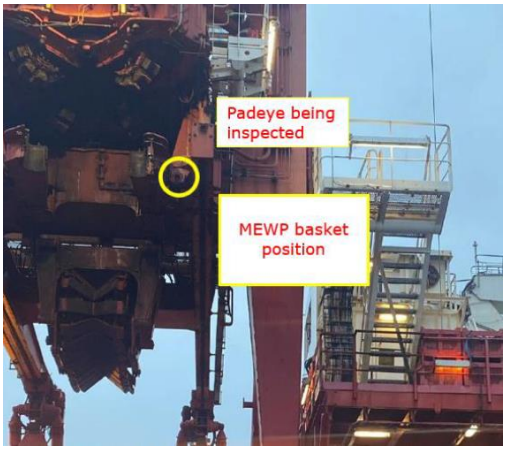
Applicable Life Saving Rule(s)

Bypassing Safety Controls

Work Authorisation

What happened

During the inspection of two pad eyes on a Tiltable Lay System (TLS) using a "cherry picker" or mobile elevated work platform on the quayside, the vessel slowly listed, causing the pipelay tower to come into contact with the work basket on the cherry picker. The hand rail on the work basket was damaged.



It is not thought that the "cherry picker" could have toppled over, due to the minimal reach of the basket and the fact that the load caused by the vessel was being absorbed by the deformation of the hand rail on the basket.

What went wrong?

Investigation determined:

- There was no Permit to Work (PTW) for the task – no control of work on the quayside or assessment of vessel Simultaneous Operations (SIMOPs);
- The Task Risk Assessment (TRA) did not include:
  - SIMOPS hazards of potential listing of vessel due to crane movements or wash from other vessels;
  - hazard of the "cherry picker" work basket being close to the vessel structure and clashing with it;
- The different toolbox talks taking place did not discuss the other simultaneous tasks occurring;
- The person operating the "cherry picker" had no valid training for it.

What went right?

The platform on the pipelay tower was accessible from the work basket. Crew in the work basket made the decision to exit the basket onto the tower and did so in a safe and controlled manner, unclipping from the basket and clipping onto the pipelay platform before climbing across.

What was the cause?

Uncontrolled simultaneous operations: during the pad eye inspection the vessel was observed to slowly list towards the quayside due to a vessel crane movement;

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Actions

- Ensure Permit to Work is required for **non-routine** hazardous Working at Height tasks i.e. for tasks where routine established procedures are not in place and in use. Worksite management should be responsible for determining on a case by case basis when a Permit to Work is required for working at height tasks.
- Review and update Task Risk Assessments to include potential for vessel movement and communication of SIMOPS activities;
- Ensure that all work that can be impacted by deck activities, is highlighted and discussed at cross-departmental TBTs;
- Have an effectively practiced and drilled plan for emergency rescue when anyone is working at height;
- If unsure of the correct method to execute a task, or the associated risks, **STOP the JOB** and ASK!

Members may wish to refer to:

- IMCA M 203 *Guidance on simultaneous operations (SIMOPS)*
- LTI: Stored energy – rigger injured leg working on quayside *[causal factor: There were simultaneous activities occurring in the area which were not properly controlled]*
- SIMOPS – Smoke from hot work task enters confined space *[improvement identified: "Additional focus to be placed on SIMOPS during the daily planning meeting"]*
- Crane contact with pipelay tower resulting in dropped object

2 UK HSE: Offshore crane boom hoist failures

The UK HSE (Health and Safety Executive) have published an alert relating to two incidents that occurred offshore, involving the failure of crane boom hoist ropes, resulting in the crane booms falling onto the deck below. Click here for the alert.

What happened

Two separate incidents occurred on offshore installations as a result of the failure of a crane boom hoist rope. In both incidents the boom hoist rope came off a sheave; this was undetected and the consequential severe damage to the ropes ultimately resulted in their catastrophic failure.

Although no-one was injured in either incident, the falling crane booms (together with the loads being lifted at the time), resulted in structural damage to the crane booms. Both incidents had the potential to cause death or serious injury to the persons involved in the lifting operations and to other persons on the installations.

Background

On one crane the rope came off a sheave in the 'A' frame and then dropped down onto an adjacent sheave bearing housing. This caused considerable wear and damage to the bearing housing.

On the other crane, the rope climbed out of a sheave in the boom tip and dropped down into the gap between this sheave and boom tip side plate. This also resulted in the rope being forced up against a structural member in the boom tip structure. The rope then cut a groove almost fully through this structural member.

Failure during lifting

The HSE notes: *"Consequently, both boom hoist ropes suffered such serious damage that they eventually failed whilst the cranes were undertaking lifting operations. In both cases, the said ropes may have come off a sheave due to one of the following reasons:*

- *If too much slack rope is allowed to form between the 'A' frame sheaves and the boom tip sheaves when a crane boom is stowed in the boom rest, it is possible that strong winds could cause the rope to whip up, onto and over, part of the rim of a sheave in the 'A' frame. When the boom is raised again out of the rest, this could cause the*

section of rope over the sheave rim to pull up against the sheave rope retention bar and to squeeze through the gap between the sheave rim and the retention bar leaving it completely off the sheave.

- *The way in which the crane boom is hoisted and lowered may result in some bouncing of the boom. Bouncing of the boom may lead to slack forming in the boom hoist rope, allowing it to jump up, onto and over, part of the rim of a sheave in the 'A' frame. It is possible that this section of rope over the sheave rim would then pull up against the sheave rope retention bar. If the rope subsequently managed to squeeze through the gap between the sheave rim and the retention bar it would then be completely off the sheave.*
- *During the rope installation process, it is possible that a twist could be introduced into the new rope as it is installed. If the new rope is being pulled on by the old rope and if the swivel system on the rope connections is not functioning correctly any twist in the old rope could then be transferred into the new rope. It should also be noted that if the rope fleet angle between the new rope reel stand and the reeving sheave is sufficiently large then the rope could roll down the side of the reeving sheave groove during installation. This rolling action may also introduce a twist into the rope.*

  Any twist would be locked into the rope and during service this would work its way back towards the fixed rope anchorage in the 'A' frame. If the crane boom is placed into the boom rest and slack rope is allowed to form, with no tension now in the rope, it would try to untwist. As it untwists, the rope may climb up in the groove of the last sheave in the boom tip before the rope anchorage, resulting in the rope being positioned over the rim of this sheave.

  When the crane boom is subsequently raised out of the rest it is possible that the rope may become nipped between the sheave rope retention bar and the rim of this last sheave. If Nylon sheaves are fitted, should this occur, the rope may cause subsequent damage to the said sheaves."

Actions

- Ensure that when high winds are forecast, the positioning, and if necessary, the securing of crane booms, is in accordance with the relevant crane manufacturer's guidance;
- If manufacturer's guidance outlines that the boom should be stowed in the boom rest, slack rope should not be allowed to form between the sheaves in the 'A' frame and those at the boom tip or bridle assemblies;
- Ensure that cranes are operated in a controlled and smooth manner to reduce, so far as is possible, any bouncing of the crane boom;
- Inspect sheave rope retention bars (if fitted) to ensure these are in a good condition, and that the distance between the retention bars and the sheave rims remains within the maximum limit specified by the original equipment manufacturer;
- Ensure crane pre-use checks include the requirement to verify that all the ropes are correctly seated and running in the rope sheaves;
- When new boom hoist ropes are fitted that the method of installation reduces the possibility of a twist being introduced into the new rope.

Members may also wish to refer to:

- IMCA HSSE 019 *Guidelines for lifting operations*
- Short videos – *Are YOU prepared to work safely?*
  - Lifting Equipment
  - Lifting operations

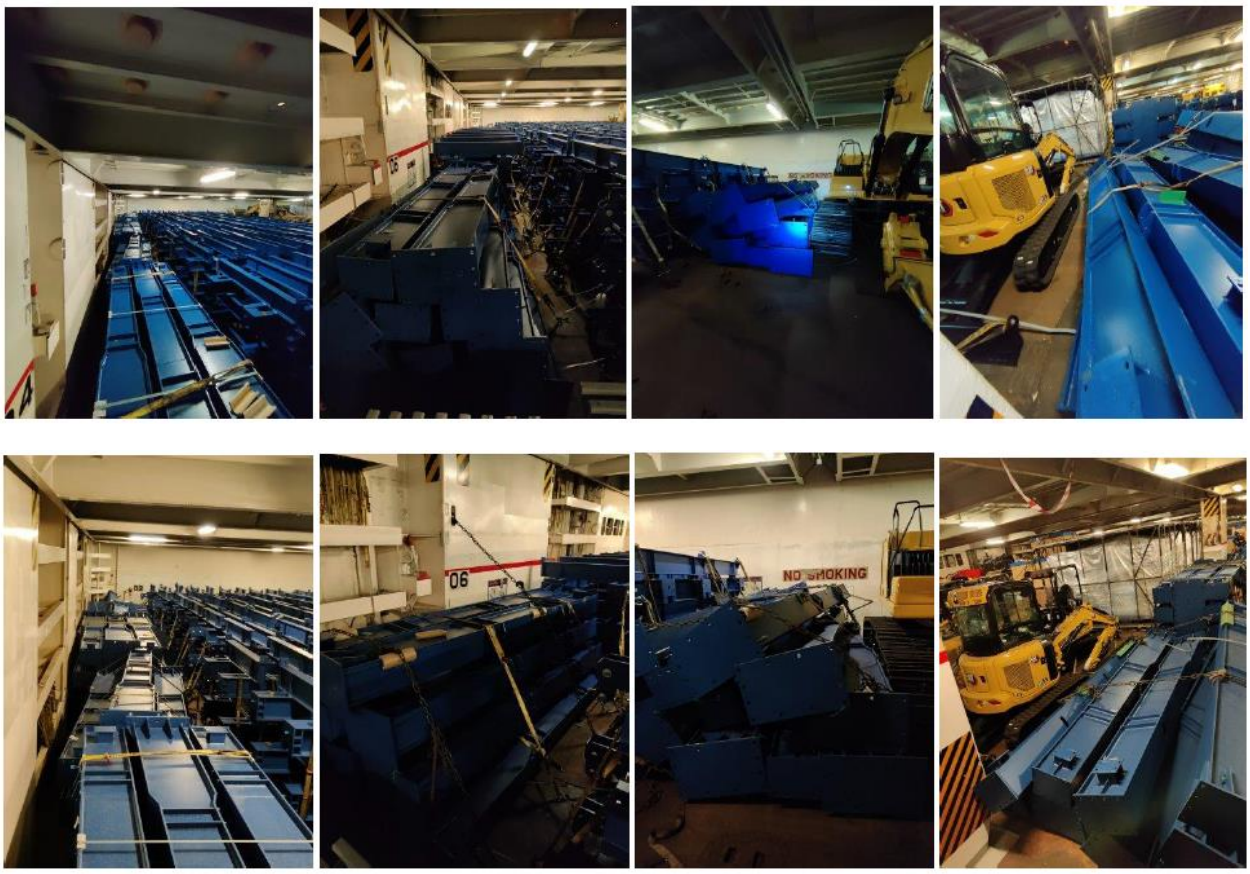
3 Cargo shifted during heavy weather

Applicable Life Saving Rule(s)

Bypassing Safety Controls

What happened

Cargo broke loose in heavy seas on a vessel in transit. Moderate to heavy rolling caused strapping holding stacks of cargo (metal beams) to break, causing the stacks to collapse. Seven stacks collapsed or shifted, and a further three stacks moved to a lesser degree. There was no structural damage to the vessel or to other cargo. The vessel altered course and the collapsed / shifted stacks were re-secured with extra chain lashings.



Showing stacks of beams having shifted

Beams tied with thin metal ties | Broken metal ties | Metal to Metal contact | Beams shifted after rolling

Findings

- The vessel was transiting at 16 knots following a route recommended by a respected weather information service provider. Winds Force 5-6, Swells 5/6, rolling moderately to heavily at times;

- There was adequate warning (at least two days) of the impending heavy weather; there had been a Bridge Team Meeting before departure at which impending weather was discussed;
- A "heavy weather checklist" had been filled in and precautions taken; lashing checks were carried out daily after departure and lashings tightened as required;
- No timber blocks were placed between/around the stacks to make them a unified block to ensure less possibility of movement. Also, the cargo was loaded on just two wooden blocks which were part of the stack and directly on deck.

What was the cause?

Our member noted the following:

- Immediate cause
  - The beam stacks (each over 9000kg and length: 4.5 m x width: 1.7 m x height: 1.9 m) were not loaded or lashed as per the Code of Safe Practice for Cargo Stowage and Securing (CSS code) for such cargo;
- Causal factors
  - Inadequate communication – there was ineffective communication between vessel and charterers;
  - Inadequate supervision – there was misjudgement of vessel movement and external force (wind, wave, and swells),
  - Lack of experience in loading / lashing such type of cargo at the Port of Loading.

Actions

- Further training on proper/effective lashing and securing of cargo;
- Discussion end education on need for vigilance and close supervision when loading;
- Additional lashings to be in place in certain weather conditions.

Members may wish to refer to:

- Serious incidents involving the weather
- Recent UK MAIB investigations (shifting of cargo and loss of cargo)
- Near miss: cargo shifted on deck in heavy weather

4 NTSB: Engine Failure leads to fire aboard offshore supply vessel

The National Transportation Safety Board of the United States (NTSB) has published a report into a diesel generator engine failure and subsequent fire aboard an offshore supply vessel (OSV) in December 2020. Further information here.

What happened

Crew on a OSV at anchor were troubleshooting speed variation issues related to two of the engines driving the vessel's generators. This involved replacement and calibration of several electrical components and multiple engine restarts. When later carrying the vessel's electrical load, one of these two engines suffered catastrophic mechanical failure. A cylinder connecting rod was ejected through the engine crankcase while the engine was running. The ejection of the connecting rod allowed atomized oil to be released from the engine and ignite, starting a fire in the engine room.

What went right?

- The crew's quick and effective actions to prevent the spread of the fire resulted in the fire extinguishing itself without putting crewmembers at risk;
- The crew isolated the fire before it could spread throughout the vessel;
- There was no pollution and no injuries to the sixteen crew.

There was, however, over $3 million worth of damage to the vessel.

What was the cause?

The NTSB determined the probable cause of the diesel generator engine failure was a cylinder's connecting rod bearing adhering to the crankshaft. In short – it seized up. This led to the ejection of the connecting rod and catastrophic damage to the engine.

Members may wish to refer to:

- Acetylene quad fire on quayside
- MSF: Crankcase failure
- MAIB: Engine failure and subsequent fire

Lessons learned

The NTSB noted that:

"The crew effectively contained the spread of a fire by removing fuel and oxygen sources.

Vessel crews should familiarize themselves and train frequently on machinery, fuel oil, lube oil, and ventilation shutoff systems to quickly act to contain and suppress engine room fires before they can spread to other spaces and/or cause a loss of propulsion and electrical power."

5 NTSB: Failure to disconnect and secure vehicle batteries led to fire

Applicable Life Saving Rule(s)

Bypassing Safety Controls | Energy Isolation

The National Transportation Safety Board of the United States (NTSB) has published a report into a fire aboard a vehicle carrier that resulted in $40 million worth of damage. See here for details. Whilst this event did not occur on a vessel involved in marine construction, the learnings and implications are applicable to IMCA members' operations.

What happened

An electrical fault from an improperly disconnected battery in a used vehicle led to a fire aboard the vehicle carrier *Höegh Xiamen* at Jacksonville, Fla., in June 2020. Nine firefighters were injured tackling the blaze, which took over a week to put out. The vessel and its entire cargo (over two thousand used cars) were effectively destroyed.

What went wrong?

- Many of the vehicles loaded had batteries that were not disconnected and secured in accordance with procedures, which increased the risk of electrical arcing and component faults. During loading operations, both the loading personnel and crew missed opportunities to address these hazards;
- Detection of the fire was delayed because the vessels' fire detection systems had not yet been reactivated after loading was completed;
- The local fire department's response to the accident was delayed because the Master did not immediately have available contact information for search and rescue authorities, and;
- The Master did not know how to report a fire to local authorities.

What was the cause?

The NTSB determined the probable cause of the fire was ineffective oversight of the loading crew, which did not identify that the charterer's vehicle battery securement procedures were not being followed. This resulted in an electrical fault from an improperly disconnected battery in a used vehicle;

Contributing to the delay in the detection of the fire was the crew not immediately reactivating the vessel's fire detection system after the completion of loading. Contributing to the extent of the fire was the Master's decision to delay the release of the carbon dioxide fixed fire extinguishing system.

Actions (in summary)

- Improved oversight and training of personnel involved in loading and in dealing with batteries and potentially hazardous cargo;
- Revision of procedures for the reactivation of fire detection systems after loading;
- Ensuring emergency contact information is immediately available for bridge teams.

Members may wish to refer to:

- NTSB: The sinking of the El Faro – an illustrated digest