IMCA Safety Flash 07/15

May 2015

These flashes summarise key safety matters and incidents, allowing wider dissemination of lessons learnt from them. The information below has been provided in good faith by members and should be reviewed individually by recipients, who will determine its relevance to their own operations.

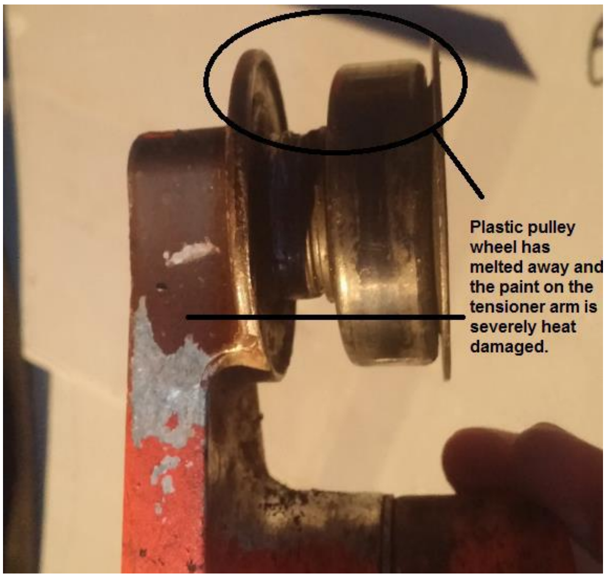
The effectiveness of the IMCA safety flash system depends on receiving reports from members in order to pass on information and avoid repeat incidents. Please consider adding the IMCA secretariat (imca@imca-int.com) to your internal distribution list for safety alerts and/or manually submitting information on specific incidents you consider may be relevant. All information will be anonymised or sanitised, as appropriate.

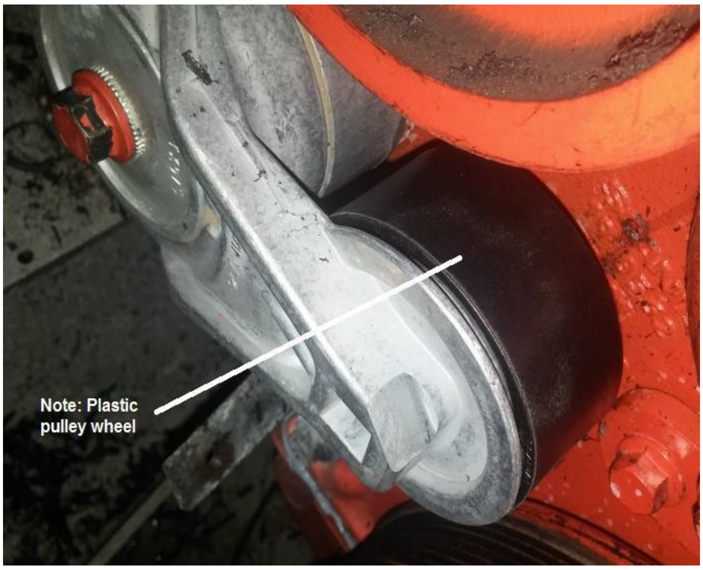
A number of other organisations issue safety flashes and similar documents which may be of interest to IMCA members. Where these are particularly relevant, these may be summarised or highlighted here. Links to known relevant websites are provided at www.imca-int.com/links Additional links should be submitted to webmaster@imca-int.com

1 Second-Hand Equipment Causes Engine Breakdown

A member has reported an incident in which an offshore wind farm Crew Transfer Vessel (CTV) suffered an engine breakdown due to the drive belt automatic tensioner seizing. The incident occurred whilst the vessel was on transit from harbour to site. The port engine alarm activated, it was quickly discovered after short investigation that the main engine auxiliary belt that drives the alternator and the cooling pump had broken and the belt tensioner was badly damaged.

The CTV had to return to harbour using one engine only, to allow for further investigation and the repairs to be safely carried out. The damaged parts were removed by the crew and replaced with onboard spares.





Figures: showing drive belt tensioner

Our members' investigation noted the following:

- The belt tensioner that failed had been fitted to the engine second-hand only two months previously, and its age and run time were unknown;
- The replacement part was only intended to be a short term solution until a new belt tensioner could be sourced and fitted;
- The bearings had fallen apart and the pulley wheel seized causing the belt to run over the stationary plastic wheel until friction caused failure;
- The engine manufacturer recommended that checks be made every twelve hours:
  - To see if the drive belt was damaged or worn
  - To see if the automatic belt tensioner was in proper working order and keeps the belt correctly tensioned;
- The service check sheets showed that these checks had been made at the previous services;
- The service report/invoice had been checked and there was no mention of the tensioner arm being replaced by a second hand spare but that it would be replaced covered by manufacturer's warranty;

- The crew did not write any notes to their opposite shift to alert them of the second hand tensioner arm being used to fix the problem and therefore there was no further communication regarding the future renewal of this equipment;
- The engine maintenance log also did not mention that the tensioner replacement was a second hand spare;
- When the new tensioner arrived onboard the crew were not aware that they needed to change the second-hand spare with it; the engine manufacturer had not informed either the crew or the management that the new part should be fitted upon arrival;
- It was noted that whilst the belt tensioner could be and was checked, it was very difficult to accurately check the pulley bearing as it was a sealed unit with no means of lubrication during its working life (only at manufacture) and it was not possible to see the condition of the bearing;
- The engine manufacturer offered no guidance advising on a lifespan or recommended change time for the belt or tensioner.

Our member drew the following lessons:

- Servicing guidelines and procedures: improvements were made to on-board servicing guidelines for engines of this sort;
- Communications and record-keeping: comprehensive and proper records should be made in the vessel maintenance log – and forwarded to management ashore – when changes were made to the engine, or parts therein were replaced.

Members may wish to refer to the following incident (key words: *home-made*):

- IMCA SF 01/11 Incident 6 – *Failure of home-made [lifting] equipment.*

Or the following incidents (key words: *engine, CTV, wind*):

- IMCA SF 12/13 Incident 3 – *Incidents of failure of jet drives on wind farm service vessels*;
- IMCA SF 10/14 Incident 3 – *Fire in engine space on CTV (Crew Transfer Vessel);*
- IMCA SF 02/15 Incident 5 – *Near miss: man overboard [following engine failure].*

2 Near Miss: Unexpected Water Ingress during Fault Finding of a Cracked Water Pipe

A member has reported a near miss incident in which large volumes of sea water were found in the bilges of a small boat (offshore wind turbine CTV). The water was discovered during pre-shut down checks when the vessel was alongside. After initial fault finding it was found that there was a leak due to a cracked raw water cooling return pipe from the port side main engine. The crew closed the raw water sea chest and after making every effort to temporarily seal the crack, went ashore to seek a long-term solution.

When the crew returned to the engine room it was found that the leak had continued to flow into the bilge, though not much had entered the bilge; it was thought that it was probably resting water from the engine. The bung was removed and the water flow was monitored to check that the resting water was emptying out of the system, after approximately 20 minutes the water had not ceased to stop flowing and the crew became concerned.

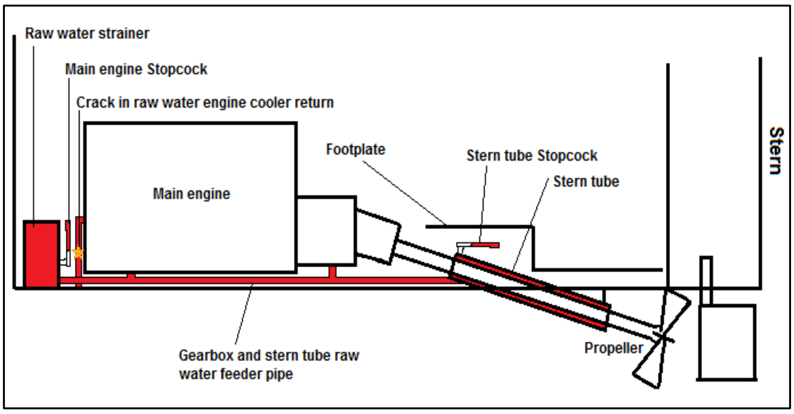


Figure: location of stopcocks

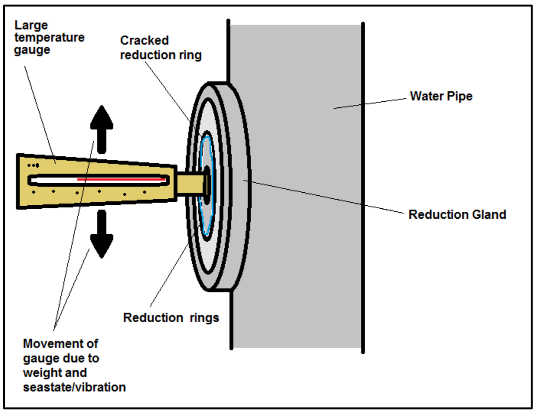


Figure: original fault

Our member notes:

- During subsequent further fault finding to eliminate the source of the water flow it was found that the flow was coming from the stern tube;

- This particular type of vessel was propeller driven with water lubricated stern tubes. Underneath the floor plate at the stern gland there was another seacock;
- This seacock had not been highlighted to the crew during delivery of the vessel;
- There was no hatch in the foot plate to allow easy access to the valve;
- The pipe was repaired the following morning;
- An investigation is currently underway as to why the pipe cracked. Preliminary consideration was that it may be due to the weight of the temperature gauge causing the pipe to weaken over time.

Our member required the crews of other similar CTVs from the same manufacturer to check the plastic pipes in the engine rooms regularly for signs of deterioration or stress around the reduction glands and temperature/pressure gauges, and any deficiencies were to be immediately reported to the management.

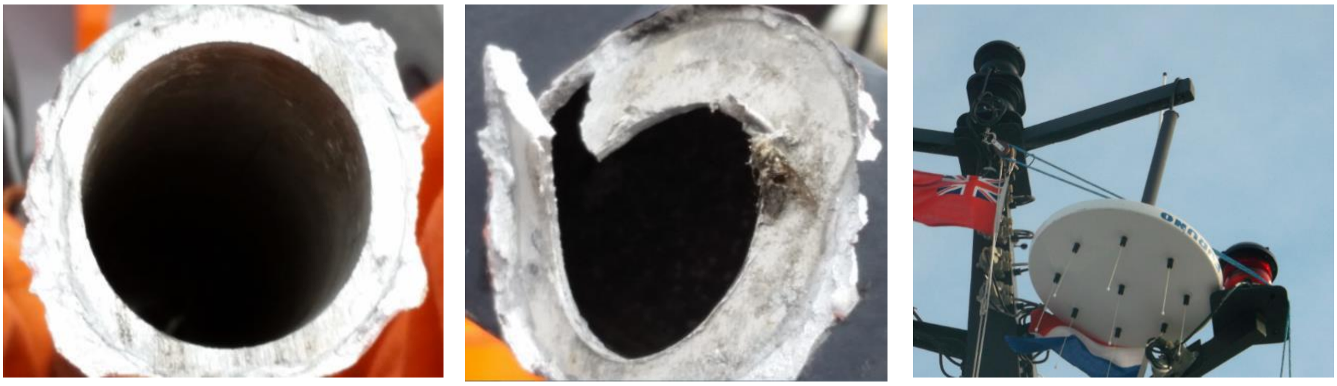
Members may wish to refer to the following incidents (key words: *water, ingress, CTV, engine*):

- IMCA SF 09/02 Incident 2 – *Loss of a vessel* [owing to water ingress to engine room];
- IMCA SF 05/10 Incident 2 – *Water ingress to bow thruster space*;
- IMCA SF 19/14 Incident 6 – *Fire in wheelhouse on offshore renewables crew transfer vessel.*

3 Near Miss: Equipment Failure: Broken Mast Arms

A member has reported two near miss incidents in which there has been a failure of a mast arm on a CTV. Both incidents related to weld fatigue. In both cases heavy aerials have caused welds to crack and break over time until the mast arm gives way.

Figures: photographs of mast damage following the first incident



Figures: photographs of mast damage following the second incident

In both cases the CTVs were able to safely navigate back to harbour. However, this could have very easily been a different story if the conditions were different or if the mast had damaged any of the equipment.

Our member recommended the following:

- On CTVs, mast checks should be to be added to a planned maintenance or check schedule;
- These checks should focus on the tension of the shrouds and the strength of the welds supporting the mast arms;
- Extra special attention should be given to those parts of the mast that are unsupported and connected to large or heavy aerials or equipment.

Members may wish to refer to the following similar incidents (key words: *mast, fatigue, weld, failure*):

- IMCA SF 04/10 Incident 2 – *Falling object* [from mast];
- IMCA SF 06/13 Incident 3 – *Near miss: dropped object - falling camera;*
- IMCA SF 02/14 Incident 4 – *Vibration-induced fatigue on process pipework.*

4 Minor damage to pontoon cleat during Crew Transfer Vessel Mooring Operations

A member has reported an incident in which a pontoon cleat was damaged during offshore renewables Crew Transfer Vessel mooring operations. The incident occurred when the vessel was leaving its berth. When the mooring lines were being removed, the master caused the vessel to pull back onto the spring line to allow the forward breast line to be released. At this point the mooring cleat on the pontoon gave way and broke, flying across the pontoon near to where a crewman was standing whilst assisting with the mooring ropes. There was minor damage and no injuries.

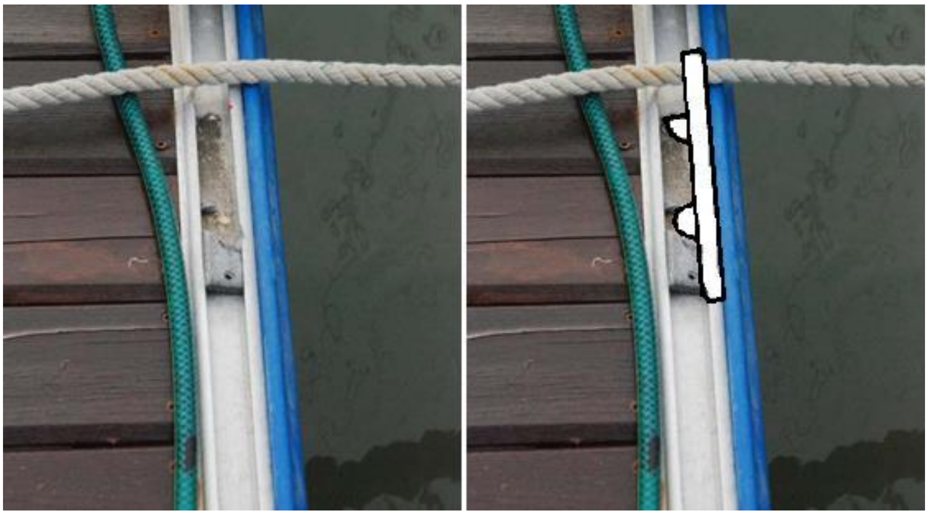


Figure: showing damaged cleat

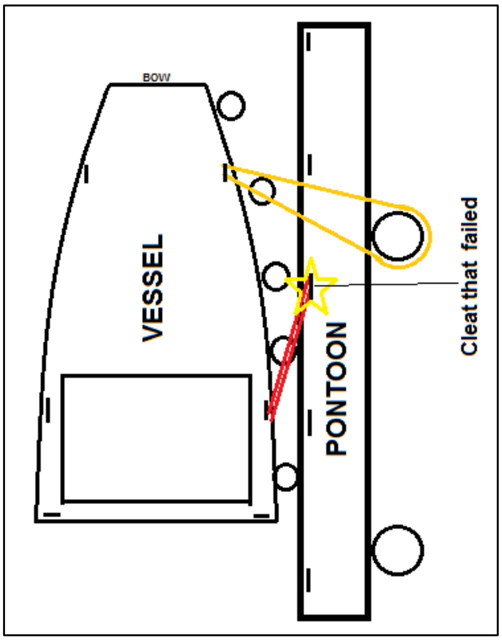


Figure: Schematic showing mooring line layout at the time of damage

Our members' investigation noted the following:

- The vessel was alongside due to very strong winds and was waiting for the next opportunity to sail;
- Owing to the strong winds, the vessel had been secured with additional mooring lines around the pontoon uprights to help alleviate pressure;
- The vessel had been moored in position for six days alongside the pontoon and had been tied to the same cleats for the whole time, most probably weakening the cleat due to the increased stress of the large vessel weight added to the wind force pulling on them;
- The vessel had been pushed away from the pontoon by the wind, which put significant stress onto the mooring cleats, possibly leading to equipment/material fatigue and consequent increased likelihood of failure;
- This particular model of CTV was Fixed Pitch Propeller driven and also has a large air draft, making it susceptible to being affected by the wind whilst moored or manoeuvring;
- When the vessel was preparing to leave the pontoon to begin work after the bad weather, one mooring line had been left attached for one reason or another and come under load as a result of the vessel's movements.

Our member recommended:

- Larger, heavier crew transfer vessels should moor onto pontoon uprights or purpose-made heavy duty mooring points during bad weather, this was to avoid unnecessary stress or weakening to pontoon equipment designed typically for use by yachts and smaller vessels;
- Improve communications between master and crew onboard the CTV (for example, holding a toolbox talk) before manoeuvres were made in order to get underway, this was to avoid mooring lines being left attached and coming under load. In these cases the casualty was a cleat, but it could easily have been a critical piece of equipment or even an arm or leg;
- "Closed loop" communications should be adopted, i.e. feedback made that all communications were properly understood before action taken.

Members may wish to refer to the following:

- IMCA SEL 038 – *Mooring incidents* safety video;
- IMCA Mooring safety poster;
- IMCA SEL 029 - *Mooring practice safety guidance for offshore vessels when alongside in ports and harbours.*