

IMCA Safety Flash 08/17

April 2017

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 info@imca-int.com

Any actions, lessons learnt, recommendations and suggestions in IMCA safety flashes are generated by the submitting organisation. IMCA safety flashes provide, in good faith, safety information for the benefit of members and do not necessarily constitute IMCA guidance, nor represent the official view of the Association or its members.

The following incidents all involve actual injuries – a “line of fire” finger injury, an eye injury caused when a foreign body was shaken off personal protective equipment (PPE) into the eye, and a leg injury caused by a flying object.

1 Serious Finger Injury: Procedures During Engine Maintenance

A member has reported an incident in which an engineer suffered a serious finger injury during planned engine maintenance. The incident occurred alongside during overhaul of a main engine in which the pistons were being replaced.

Upon removing one of the pistons, the bottom end bearing cap had been removed and the crankshaft was being turned down to move the crank pin and main bearing shells out of the way of the serrated con rod bottom. The injured person’s right hand was holding the con rod off the crank pin in order not to damage the cylinder liner and crank pin/bottom end bearing shells.

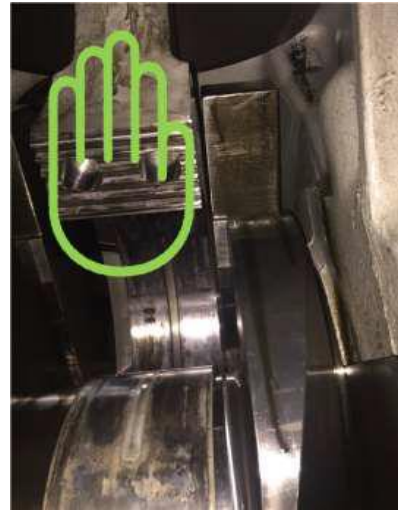
The crank web counter balance was not seen by the injured person as it came around and trapped his little finger between the con rod and crank web counter balance. The crank was immediately turned back and his hand removed from the crank case. He was given first aid treatment on board for a laceration across the width of his right little finger and then immediately sent to local hospital for further treatment.

He returned to the ship the same day having received 7 stitches to the right little finger; the hospital confirmed that there was no other damage.

Our member noted the following:

- ♦ **Work Planning** – the work was fully planned, with Risk Assessment and Toolbox Talks conducted, recorded and on-file;
- ♦ **PPE** – the injured person was wearing full required PPE including mechanics gloves; use of these gloves prevented the injury being far worse;
- ♦ **Immediate Actions** – on-board immediate first aid was applied and subsequent external medical treatment was sought;
- ♦ **Follow-up Actions** – the vessel is updating the existing risk assessment to improve safety emphasis on correct hand placement during the task;
- ♦ **Hand Placement** – the injured person had his hand in an unsafe location within the machinery, between the con rod and counter balance; his hand should have been on the con rod itself, with thumb tucked in, to avoid pinch/trapping risks as the counter balance moved.





Feedback from vessel crews

On learning about this incident, crews asked a number of questions about the incident:

- ♦ **Question:** *How was the engine barred over? When doing unit liner changes in the past, I always barred over by hand (i.e. very slowly); was this instance hydraulic or pneumatic powered?*
 - **Answer:** The engine is barred over using the electric motor powered turning gear. Because of the mounted position of the turning gear it would be unfeasible to rig up any method of "hand" turning gear. The only method of hand turning the electrically-driven turning gear is by means of a machined square on an extension of the electric motor shaft, but the gearing within the system renders this method of turning the shaft impracticable as it would take excessive amounts of time for even the smallest movement of the crankshaft.
- ♦ **Question:** *Had the injured person done this type of job before?*
 - **Answer:** Yes, the injured person has carried out this job before and is an experienced 3rd Engineer, having recently passed his 2nd Engineer's CoC.
- ♦ **Question:** *Was the Engine Manual being followed?*
 - **Answer:** Yes. The engine manual was being followed rigorously during this overhaul as is an absolute requirement for safe operation and future reliability of the engine. There is a dedicated team of competent engineers and fitters assigned to the task, full inspections and calibrations are taking place and a comprehensive report being compiled. Correct re-assembly procedures and torque settings were being followed rigorously and any suspect components replaced. It should be noted that the engine manual provides little specific guidance on handling components during maintenance.
- ♦ **Question:** *Was a soft stop used around the con rod, to lift it off the shaft?*
 - **Answer:** Not at the time but, since the incident, we have carefully considered different options for supporting the piston and connecting rod whilst turning the crankshaft out, whilst also protecting these components from damage; it is possible to use a substantial wooden lever or a soft stop to avoid placing hands inside.
- ♦ **Question:** *What type of engine was it – a V or Inline? In the case of an Inline Engine, once the second last piston is disconnected, the Crankshaft would turn very quickly due to the weight of the last Piston having a turning effect on the crankshaft.*
 - **Answer:** V engine. It is recognised that V engines are more difficult to work on, compared to inline engines, due to smaller components for a given power output and restricted space in the crankcase. This vessel has a very large number of cylinder units (40 in total) requiring periodic overhaul which adds time and potential risk to engine work.

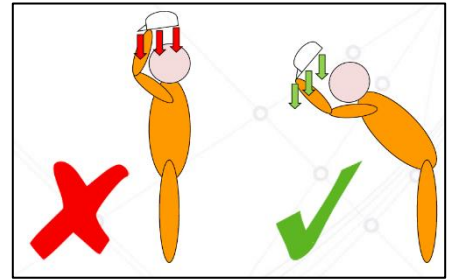
Members may wish to refer to the following:

- ♦ **IMCA SF 28/16 – Focus: Hand injuries;**

- ◆ [IMCA SF 13/11](#) – Incident 2 – *LTI: thumb Injury*.

2 Eye Injury: Crewman Got Something in His Eye When Removing His PPE

A member has reported an incident in which a seafarer had to receive medical treatment due to a foreign object getting in his eye. The incident occurred when the injured person had been chipping with a chipping gun and other tools. At the end of his shift, approximately 17.20 local time, he stopped the gun and began removing his PPE. While removing his face shield, some rust debris – trapped on top of the face shield's upper lip – fell onto his face and into his left eye. He immediately went to the nearest eye wash station and flushed his eye thoroughly. Assuming that his condition was not serious, he did not report this occurrence to anyone else on-board even though he felt the foreign object was still caught in his eye.



At 07.30 the following morning, before starting his shift, he went to the 2nd Officer, complaining of his condition. After close examination by the 2nd Officer, it became apparent that there was still debris in the injured person's left eye, so it was decided to land the injured person to the local medical clinic for further treatment. At the clinic, the particle was removed and anti-infection medication was issued; the seafarer was returned to the vessel on the same day.

What went right:

- ◆ Work Planning – The work was fully planned, with Risk Assessment and Toolbox Talks conducted, recorded and on-file;
- ◆ PPE – He was wearing full required PPE – boots, helmet, coveralls, gloves, full face shield and safety glasses underneath the face shield;
- ◆ Immediate Actions – He went immediately to the eye wash station to self-administer initial first aid.

What went wrong:

- ◆ He did not report the incident – **report every incident, near miss and observation**, regardless of how minor you think it is!
- ◆ Had he reported immediately to the Medical Officer, further first aid could have been administered on board and a hospital visit could have been avoided;
- ◆ He removed his face shield without being careful – when removing any PPE and equipment be sure to clean off as much debris as possible; this will prevent foreign objects, dust, debris, particles etc. coming into contact with you.

General advice on removing head & face protection:

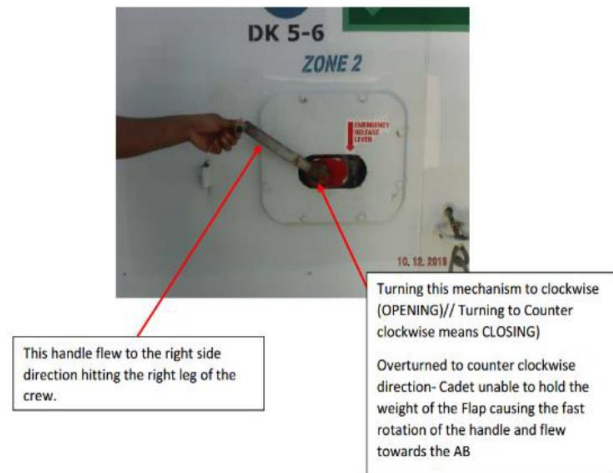
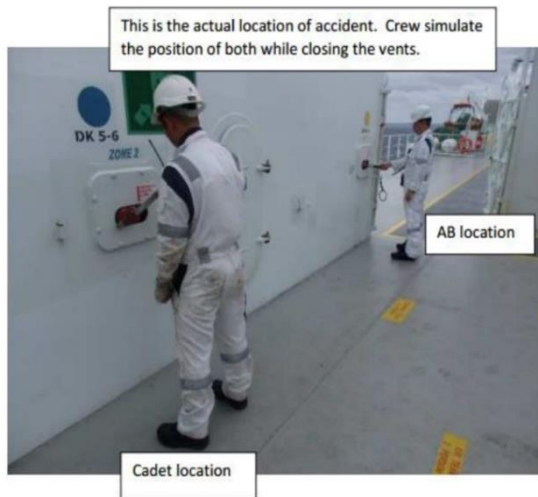
- ◆ Bend forward at the waist – this will ensure any debris falls onto the deck away from you and not into your face and down your coveralls!
- ◆ Ask for help – if necessary, get a shipmate to “spot” you as you go, so they can remove any debris from your PPE and clothing before taking it off.

Whilst members' attention can be drawn to a number of previous eye injuries, none have as a causal factor the careless way in which the injured person removed his PPE, unfortunately allowing debris into his eye.

Please see the IMCA pocket card [Keep Your Eyes on Safety](#).

3 Lost Time Injury (LTI): Leg Injured While Dealing with Vent Flaps

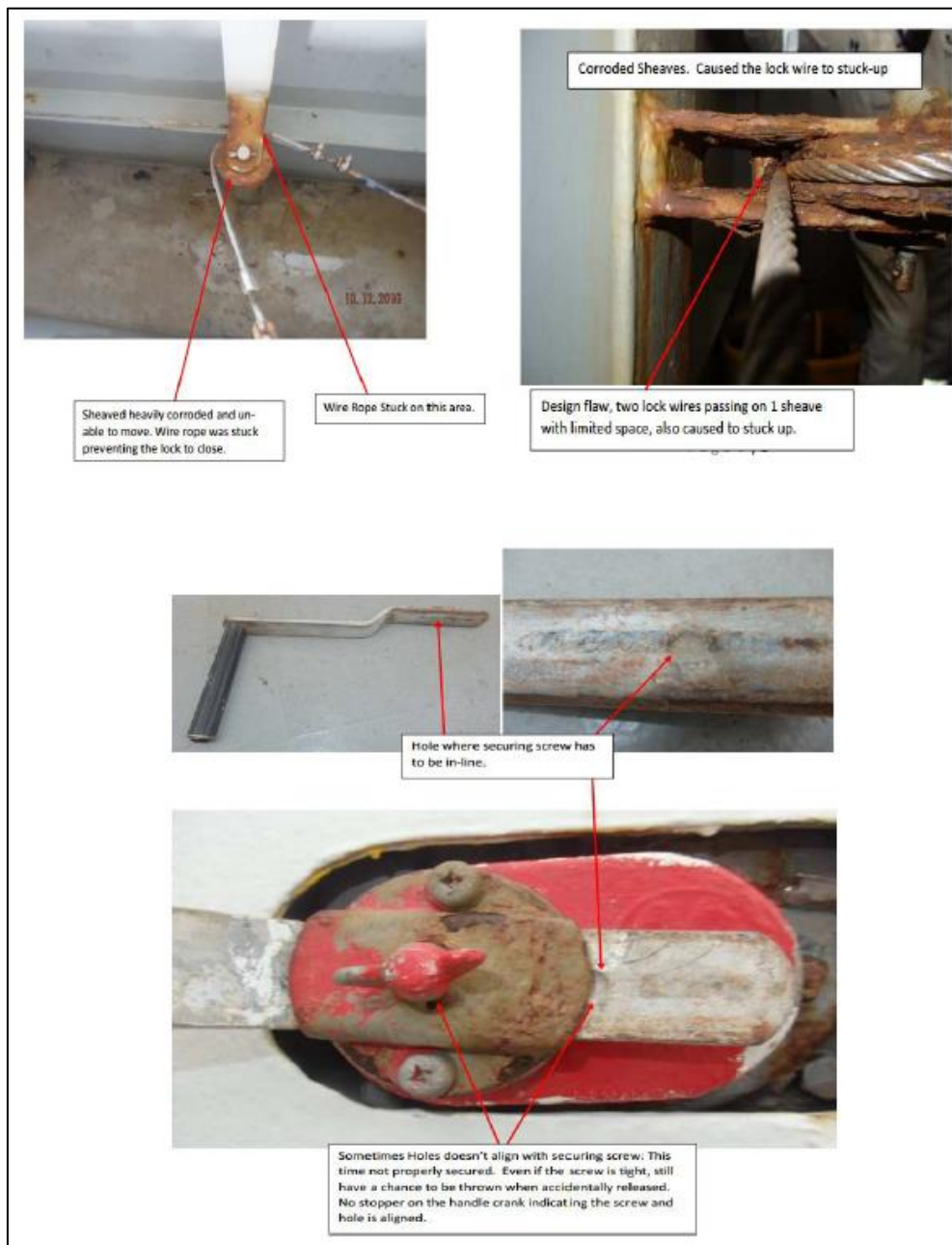
A member has reported an incident in which a crew member suffered a serious leg injury whilst closing ventilation flaps. Two crewmen, one an AB, the other a more inexperienced Cadet, were on the upper deck closing the flaps when a crank handle used to wind the flaps closed became detached and flew through the air. It hit one of the crewmen on his right shin, lacerating his skin and fracturing his leg. He was evacuated by helicopter for treatment ashore.



Our members' investigation noted the following:

- ◆ Each crewman closed a different vent, winding the handles anti-clockwise;
- ◆ The Cadet felt no more counter weight on his crank handle and informed the AB that his vent was closed;
- ◆ The AB told him keep turning the handle to "make sure":
 - by continuing to turn the handle counter clockwise the cadet had started to *raise* the vent flap again (turning the cable the opposite way onto the drum);
- ◆ After less than a minute of further turning the cadet felt weight coming onto the handle again and accidentally let go. The handle quickly rotated clockwise and the crank handle detached and flew through the air, hitting the AB;
- ◆ The vent house door remained padlocked following a port call – there was no visual means of checking that the flaps were closing;
- ◆ There was no written Risk Assessment for the operation;
- ◆ There were a number of **immediate causes**:
 - the emergency release lever was in the wrong position
 - the safety locks were stuck open due to a rusted sheave trapping the wires
 - the shallow indentation and wingnut screw used to secure the handle was inadequate;
- ◆ **Causal factors** that were identified:
 - lack of experience and knowledge: The Cadet did not trust his initial judgment that the flap was closed and followed the instruction to keep turning. A more experience crewmember may have been more confident to trust his instinct. He was not aware of proper position of the emergency release and was confused by the instructions painted above
 - inadequate planning and procedures, inadequate maintenance and design of equipment;

- ◆ **Root causes** identified:
 - risk was not fully assessed or understood and was considered tolerable
 - instructions and warnings were unclear and confusing
 - maintenance of the wires, sheaves, winches locks and handles was not adequate
 - the securing mechanism for the crank handle was poor and left the handle inadequately secured;
- ◆ The **preventative action** taken was to:
 - prepare training in this operation
 - develop a risk assessment including minimum crewing required to do the task safely
 - appropriate maintenance and repair of the wires, sheaves, winches locks and handles
 - Ensure instructions are correct.



Members may wish to refer to the following incidents:

- ◆ [IMCA SF 09/12](#) – Incident 2 – *Near miss: cement tank hatch failure;*
- ◆ [IMCA SF 04/16](#) – Incident 5 – *Finger injury: pinch point* [involving opening a hatch].