

IMCA Safety Flash 16/08

October 2008

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 Laptop Battery Fire and Explosion

A member has reported an incident which highlights the potential hazards of the lithium-ion batteries used in laptop computers.

The incident occurred offshore in the accommodation on a member's vessel. The batteries of a popular brand of laptop computer (Dell Inspiron 6000) exploded while that laptop was not in use (it was being charged at the time with an appropriate proprietary battery charger). The owner of the computer was present at the time of explosion. The person lifted up the computer and unplugged it immediately after flames and smoke came out. The batteries fell out of the computer on to the floor of the cabin, which suffered slight fire damage as a result. A fire extinguisher was then used on the smouldering batteries. The vessel fire alarm was triggered by the event. Personnel involved in the incident responded correctly; due to their actions an escalation was prevented. No one was injured.

It will be noted that laptop battery fires have happened on occasions in the past when Dell found it necessary to recall certain of its batteries because of the risk of explosion, fire and injury. Several other producers of laptops and the associated batteries – Sony, Toshiba, Apple, HP and Fujitsu – have all encountered similar problems.

Clearly the outcome of such a battery fire can be severe. In slightly different circumstances this incident could easily have resulted in a serious fire.

The following preventive actions have been suggested by the company:

- ◆ Never leave charging laptops unattended – either at home or at work;
- ◆ If you are not sure of your own laptop (battery) check the manufacturer's website or contact the store where it was bought for information.

2 Pallet Lifter Failure

A member has reported an incident in which a pallet lifting frame suffered a catastrophic failure. Various stores were being lifted onboard a company vessel during a recent mobilisation. A crate, containing a crane motor, was being lifted from the quayside on to the vessel deck; during this operation the pallet lifter being used suffered a catastrophic failure as the lift started. No one was injured.

The crate was observed to be tagged as weighing 1.6Te, and with a SWL of 2Te the pallet lifter was deemed suitable for the proposed lift. The pallet lifter was brought into place and the crate strapped around it. The lift was then started, with personnel standing clear, and when it was approximately 1m above the quayside the pallet lifter failed and the load dropped back to the quayside.

The pallet lifter had failed at a point on the stem near the forks, where it had buckled through 90°. The pallet lifter was disconnected and left on the quayside and the crate re-rigged and successfully lifted onboard.

Personnel involved in the lifting operation failed to inform vessel management at the time of the incident but later a report was made, though this was not received by the relevant vessel personnel until the following day, when an onboard investigation was begun.



Investigation proved difficult as most of the evidence had been removed. The crate had been sent off with the garbage and the tag indicating the weight of the load was not kept. The weight of the crane motor (the load which was dropped) was established at 1.4Te, proving that the pallet lifter had failed below its SWL of 2Te.

Further investigation of the pallet lifter revealed an area of corrosion on the underside of the forks where a hole had appeared. In addition the small hole on the otherwise smooth plate end of the cross beam indicated that deterioration was taking place inside and working outwards and would not have been evident unless the pallet lifter had been turned on its side. The pallet lifter had been inspected four months previously during the six-monthly rigging inspections and the corrosion was not identified. With the extent of the corrosion, some signs would have been evident during this inspection but were not spotted or highlighted.

Onboard personnel who had been using the equipment had also failed to identify that serious corrosion of the pallet lifter had occurred.

The following conclusions were drawn:

- ◆ The corrosion had weakened the structure to such an extent that the pallet lifter could not operate within its working limits. This highlights the fact that reliance on rigging certification is not enough and a regime of continued close and thorough monitoring of lifting equipment should be maintained at all times;
- ◆ The actual weight of the crate was not accurately known at any stage and this led to confusion. It was never verified at any stage prior to being lifted. The manifest detailed the weight at 3.2Te, the ID plate on the motor detailed the weight at 2.6Te, the tag showing 1.6Te was never in place as this was confused with an ID number and the actual weight was 1.4Te.
- ◆ It is imperative that weights are accurately known prior to carrying out a lift;
- ◆ The investigation was seriously hindered by the incident not being reported when it occurred;
- ◆ The pallet lifter inspection regime failed to identify the extent of the corrosion.

The following actions were recommended:

- ◆ Vessel crews should thoroughly check the condition of any pallet lifting devices they have onboard, with particular focus on the corrosion experienced by this unit. Any devices found to be in an unsatisfactory condition should be removed from service immediately and quarantined;
- ◆ Failure of lifting equipment should be reported immediately rather than 24 hours after occurrence, in order to enable an effective investigation to be carried out;
- ◆ Personnel involved in lifting operations should ensure that the weight of a load is accurately known prior to starting a lift; if there is any doubt or the information is not provided, the lift should be delayed until accurate information is found;

The pallet lifter inspection records and process were investigated separately as a result of this incident.

3 Fire Risks of Intermediate Bulk Containers (IBCs)

Members' attention is drawn to a recent communication from the UK Health & Safety Executive (HSE) regarding the fire performance of composite or plastic IBCs. These are widely used for storage and transportation of combustible liquids.

There have been a number of serious recent fires in the UK that started or spread as the direct result of the use of plastic IBCs for combustible liquids. Following investigations at the scenes of these fires, a research project was undertaken by the HSE to provide data to allow more reliable risk assessments for premises using IBCs for liquid storage and to provide a stimulus and direction for change in IBC selection and design.

A short and very informative video of an IBC fire test, which provides a graphic summary of the findings, can be viewed at <http://www.hse.gov.uk/research/rrhtm/rr564/>

A comprehensive report on this matter was prepared by HSE. Some of the main findings of the report are summarised below.

Main findings:

- ◆ In an IBC fire, all (combustible) liquid in a stock of unclad IBCs on level ground is likely to be released in a period of the order of five to ten minutes;
- ◆ IBCs containing liquids with a hydrocarbon character, e.g. fuel oils, edible oils and lubricants, fail very much more quickly in fires than those containing water. The leakage rate on failure is also very much higher;
- ◆ Plastic components of IBCs, i.e. valves, corner protection, plastic pallets etc., are easily ignited, e.g. by a match;
- ◆ Even IBCs containing high flashpoint liquids (up to at least FP 200°C) give severe pool fires involving all of the contents;
- ◆ Metal cladding, of the sort currently used for static protection of some IBCs, can reduce drainage rates. However, very rapid leakage of liquid may still occur following explosions in the ullage;
- ◆ Unless composite IBC design can be improved to reduce the rate of liquid drainage in fires, the potential consequences of fires will continue to be very serious.

Main recommendations:

- ◆ Risk assessments for IBC storage areas or buildings should be based on the premise that liquid loss will be rapid and complete;
- ◆ The risk assessment should cover the interaction between IBCs and steel drums. It is good practice to segregate IBCs and drums to avoid rapid onset of catastrophic failure of drums and associated fireballs and projectiles;
- ◆ A risk assessment is required for areas or buildings that contain any combustible liquids in IBCs or plastic drums with flashpoints up to at least 200°C;
- ◆ Manufacturers and suppliers of IBCs should provide clear information on the potential behaviour of IBCs in fire when the containers are supplied;
- ◆ Kerbs and partitions in storage areas may be useful in checking the flow of liquid and spread of fire. For partitions to be effective, the drainage of storage areas should be carefully controlled;
- ◆ Manufacturers should explore the potential for improvements in design;
- ◆ Operators of sites with large stocks of IBCs should consider the pattern of drainage in the event of fire.

The full report – *Fire performance of composite IBCs* – can be downloaded from www.hse.gov.uk/research/rrpdf/rr564.pdf