IMCA Safety Flash 18/08

December 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.

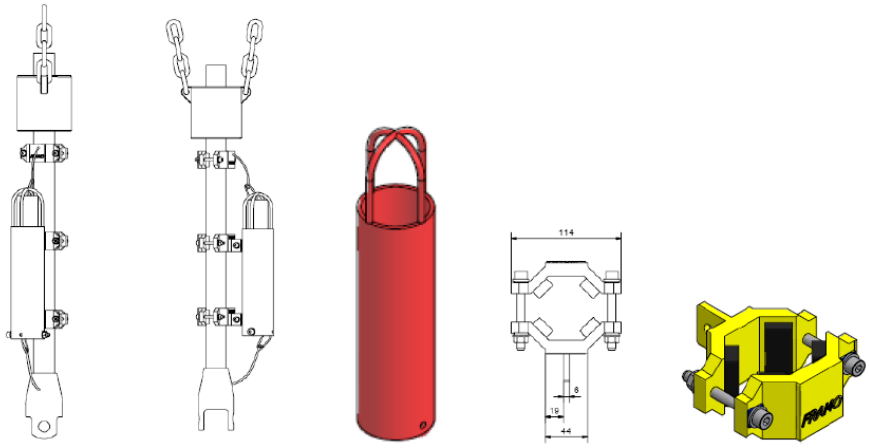
The effectiveness of the IMCA safety flash system depends on receiving reports from members in order to pass on information and avoid repeat incidents. Please consider adding the IMCA secretariat (imca@imca-int.com) to your internal distribution list for safety alerts and/or manually submitting information 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 Mini Transponder Falling from Crane Wire to Deck

A member has reported an incident in which a mini transponder attached to the crane wire came loose and fell 20m to the deck.

A 35m long pennant wire with a guide anchor in the end was being used to open/close hatches on templates. After closing hatches the wire was recovered to deck. A mini transponder was attached to the crane wire just above the crane hook, with two hose clamps. Due to the length of the forerunner the crane had to lift it as high as possible and the wire remaining outside the side of the ship had to be manhandled over the rail. Due to a failing end stop mechanism the crane was hoisted too far and the mini transponder was torn off the crane wire and fell to the deck, narrowly missing two members of the crew who were under the crane ready to manhandle the wire end in on to the deck. There were no injuries.



Transponder bracket design

The following points were noted:

- Deck personnel should not have been under the load or in the lifting area;
- Deck personnel should be reminded to always wait for a signal from the crane driver before moving into a lifting area;
- The practice of attaching the transponder to the crane wire should be identified as a risk and discussed appropriately at toolbox meetings beforehand;
- The faulty end stop mechanism on the crane was repaired – as this mechanism was the only barrier preventing the wire from being hoisted too far, the electrical switches on the end stop mechanism were replaced with switches of a better quality;
- A formal procedure was implemented for safely attaching the transponder to the crane wire;
- A purpose-designed transponder bracket was designed and fabricated for fastening these to the crane wire, such that the transponder itself cannot hit the end stop block.

2 Failure of Pipe Handling System Causes Injuries and Fatalities

A member has reported an incident in which the failure of a J-lay pipe-handling system caused two pipes to be dropped, one of which caused injuries to eight people, four of whom died as a result. During pipe-laying operations, a system failure in the hydraulic pipe handling system of the J-lay tower (JLT) caused two quadruple joints being handled at the same time in two different areas of the tower to drop suddenly. Each piece of pipe was 50m long with a diameter of 24" and weighed approximately 20 tons.

Just prior to the incident the pipe-laying operation was stopped. Operators reported a system failure and that the hydraulic power had been lost. Such an occurrence was not particularly unusual and, in line with company procedures, this was investigated immediately. A team of technicians led by the chief electrician tried without success to resolve the problems. After these attempts, a more in-depth analysis was made. It was decided, on the basis of input from the system diagnostics, to perform a memory reset. Following this the system appeared to be running correctly. This was the first time that a full memory reset was requested by the internal diagnostics of the control system during a project operational phase.

Only after all indications that everything was in order and all systems were up and running again was the instruction given to the operator to restart the hydraulic packs. As soon as the hydraulic power packs were started, a loud bang was heard along with the noise of the hydraulic systems. One quadruple joint within the J-lay tower, held by the transfer system, was released and fell about a metre to the upper welding deck. At the same time, the quadruple joint held by the pipe elevator at the top of the J-lay tower was also released from its clamps and the hydraulic safety stop swung away, allowing the pipe to fall the full height of the tower, smashing through the access platform located outside the non-destructive testing/coating station to the lower deck below.

All the people who were injured had been on the access platform which was destroyed. The force of impact caused some of the injured persons to fall down on to the lower deck at the base of the pipe-lay tower and some to be thrown overboard.

Eight persons were injured, two seriously and two slightly. Four of the injured persons died as a result of their injuries.

J-lay tower

The primary causes of the incident were found to be:

- Sudden release of the two quadruple joints was caused by a failure in conceptual design of the control system software. The program relevant to the JLT initialising instruction was pre-loaded in the erasable programmable read-only memory (EPROM) of the programmable logic controller (PLC) with the instruction to open all clamps. **Members are**

recommended to investigate the possibility that this could happen to the PLC-based control systems on equipment on their vessels.

- The unnecessary presence and uncontrolled access of working personnel on to the access platform destroyed by the falling pipe exposed personnel to suspended load/dropped object hazard.

Pipe held in the clamps

Pipe and wreckage after the fall

Following investigation of the incident, a number of corrective actions were put in place by the company:

- The first primary cause was resolved with the removal of the EPROM memories from the system;
- The second primary cause has been addressed by a revision of the vessel and JLT working methodologies; pipe handling activities have been reconsidered through a dropped object philosophy in order to identify mechanical and electrical barriers, additional controls, and new set of operational procedures;
- Electrical controls:
  - a number of clamp opening operations were prevented by adding electrical circuit breakers
  - all critical sequences will be called by PLC and must be confirmed by operator via electrical push buttons;
- Mechanical controls:
  - different systems have been and will be implemented to prevent the vertical pipe drop in any section of the JLT, to restrain lateral pipe movement and fall and to secure the pipe until the internal line up is completed in the upper welding station
  - an additional public address system was installed for use during quadruple joint loader lift, and audible and visible alarms for elevator movements
  - a safety net was installed underneath the J-Lay tower platforms to guarantee protection against persons falling overboard;
- Procedures were revised in light of the incident, with the following points highlighted:
  - all pipe handling activities are to be considered as working under suspended loads
  - the immediate area around the JLT is restricted to essential personnel only
  - transit and from the JLT to be controlled by dedicated watchmen
  - no personnel at all allowed in certain areas during J-lay operations.