CRANE INCIDENT ONBOARD TANKER

October 2005

Introduction

- Fatal incident onboard one of our in-charted vessels during crane operation
- Vessel was chartered out to our biggest customer – STATOIL

Chain of events

October 2nd 2005

- Vessel arrives at Statoil Terminal in Norway to discharge a cargo of crude. In the afternoon of that day vessel's stores and provisions were scheduled to be delivered. A total of 35 pallets.
- 15:30 the tug with the pallets on it's stern deck where in position under the monorail crane.
- 15:35 the loading operation started, 11 crew member took part in the operation
- A pallet fork with an attached wire sling was provided by the terminal. The pallet fork weight 240 Kilos.

Chain of events

October 2nd 2005 cont.

- They where organised as follow:
  - Bosun made the crane ready for use and was the crane operator
  - 2nd Officer was in charge of the lifting operation and was supervising the operation
  - The electrician was stand-by in case of electrical trouble.
  - 6 crew member assisted in handling / moving the stores.
  - The C/E was physically checking the stores and provisions against documentation.
- After 2-3 pallets were lifted onboard the Pumpman relived the Bosun as Crane Operator.
- The pallets were moved at the height of approx. 2 meters above the deck level. After landing, two crew members would remove the pallet fork.

Chain of events

October 2nd 2005 cont.

- After 10-12 pallets had been lifted onboard, the Bosun removed the pallet fork from a pallet with chemicals and released it in a height of approx. 2 meters.
- The Pumpman stopped hoisting and drove the crane trolley and the empty pallet fork towards the railing for next lift.
- The 2nd Officer and the Electrician standing on each side of the lifting area where looking down at the tug to check that the tug crew were ready for next lift.
- The C/E was checking the received stores and was moving around in a high-risk area.

Chain of events

October 2nd 2005 cont.

- 16:15 a very distinct bang was heard by several people on the vessel and the tug. The crane wire broke and the fork pallet including the hook block fell down.
- It is believed that the pallet fork struck the C/E in to the back of the head (right side), and thereafter hit one of the waste oil drums placed close to the ship's rail.
- The C/E fell down and hits his head (left side) against the frame of a save-all coaming around a fuel oil tank vent pipe.
- Both injuries were later classified to be mortal by attending doctor.

Pallet Fork and Coaming

5) Fork pallet

6) Close-up picture of the FOT save-all coaming.

Chain of events

October 2nd 2005 cont.

- 16:20 the Master request the ambulance helicopter.
- 16:25 First aid personnel from the Terminal came onboard.
- 16:25 vessel stopped discharging.
- 16:35 Vessel Managers was informed.
- 16:45 Ambulance helicopter landed on port side.
- 16:52 External ambulance personnel onboard.
- 17:04 The doctor, that came with the ambulance helicopter, declares that the Chief Engineer was dead.

Chain of events

October 2nd 2005 cont.

- 17:25 Helicopter departed.
- 17:41 Two police officers came onboard.
- 20:00 Three police officers from the crime technical department came onboard.
- 21:00 Priest onboard to support the crew.
- 21:54 The deceased was taken ashore.
- 23:00 The vessel resume discharging.
- 23:03 Police officers left the vessel and the area was released. The police took samples of the hoisting wire and brought ashore both ends of the broken wire.

Immediate Causes

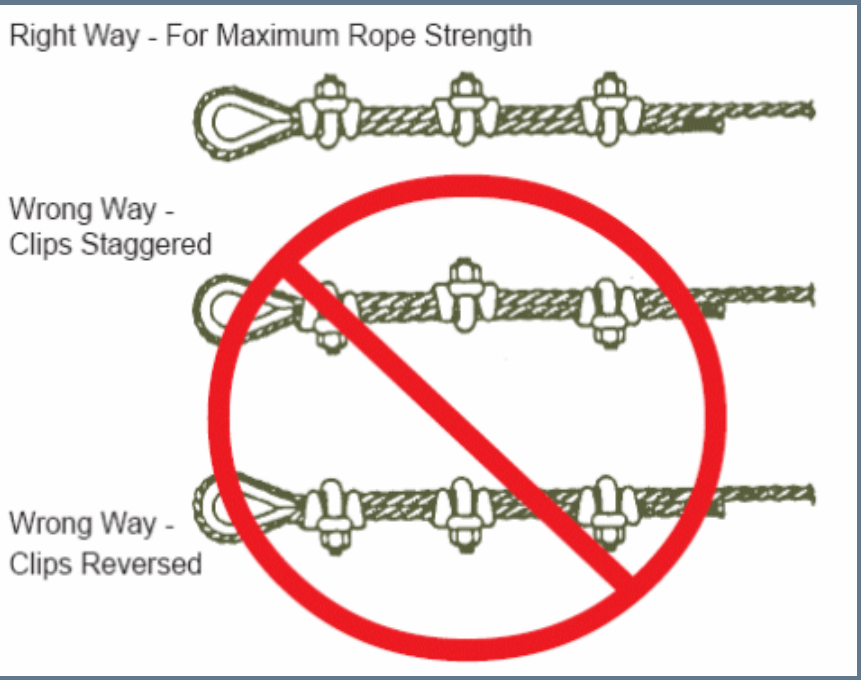
- **Immediate causes identified:**
  - Crane hook block hoisted all the way into “block’s” garage causing wire to break.

Immediate Causes

- **Immediate causes identified:**
  - Crane hoist limit switches not working / missing

Immediate Causes

- **Immediate causes identified:**
  - Hoisting wire wrongly mounted



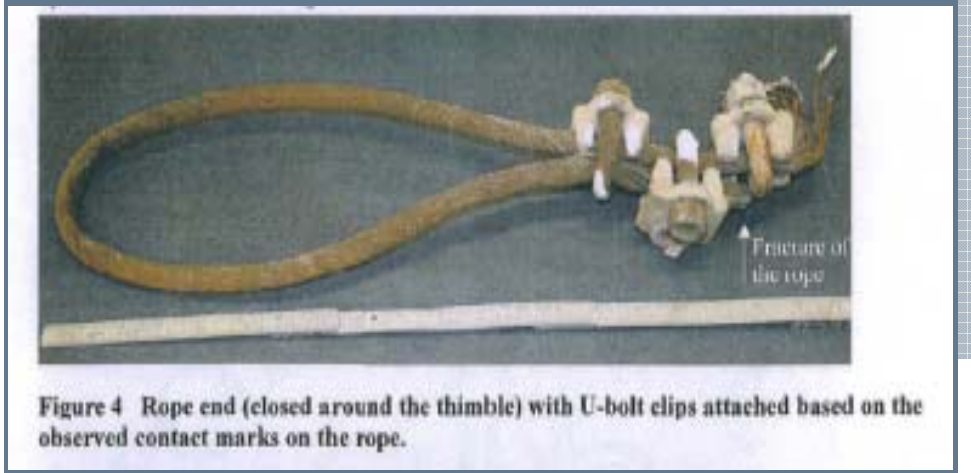


Figure 4 Rope end (closed around the thimble) with U-bolt clips attached based on the observed contact marks on the rope.

Immediate Causes

- **Immediate causes identified:**
  - Chief engineer walking under hanging load

Underlying Causes

#	Underlying / Root cause	Remarks
1	Failed to use adequate safety measures	Failed to check safety functions before use, improper organization and planning.
2	Cramped / inaccessible workplace	Overall layout of lifting area
3	Inadequate knowledge of crane maintenance	Hoisting wire mounted wrongly with wire bulldog clips.
4	Inadequate control / inspection of the crane	Both the annual and 5 yearly control / inspection should have revealed that the wire bulldog clips were wrongly mounted.
5	Insufficient planning of the work and inadequate pre-work inspection.	Pre arrival meeting was informal and just briefly addressed the upcoming stores and provisions handling operations as the cargo / ballast operation was the main issue.

Underlying Causes Cont.

#	Underlying / Root cause	Remarks
6	Personnel had inadequate training	Lack of detailed instructions relevant to make the crane system ready for use.
7	No formal or informal Job Hazard Analysis (JHA) carried out, Risk assessment for such operation not implemented.	Store and provision handling considered as being a routine and regular job.
8	Breaches of common safety practices accepted and worker misjudgment of potential hazard	Failed to observe good working practices, planning, procedures and focus on Safety.
9	Known deficiencies not corrected on time.	Malfunctioning of limit switches.
10	Earlier experiences not taken into account. No lessons learned applied from previous incidents.`	Similar accident occurred two times in past, however without injuries.
11	Worker failed to observe and comply with good working practices.	Lack of safe working practices and organization.

Identified management shortcomings

#	Company / Vessel Management	Remarks
1	Inadequate use of established systems for reporting and follow up of accidents / incidents and near misses.	Technical monthly reports indicating problems with crane in 2002 and 2003.
2	Planned Maintenance System (PMS) not updated with work orders and information corresponding to Maker's advice and recommendations.	No reference to Maker's Manual in PMS.
3	Onboard training of persons holding a dedicated role / position for inspection and maintenance of the crane is inadequate.	Overall attention to crane and lifting operations should normally require more specific training scheme.
4	The overall layout of the crane operating area was seen to be inadequate with regards to safe operations.	Obstacles in the area. Lifting area markings and access restriction.
5	Clarification of the 3rd party verification role with regard to periodical inspection and verification of the crane.	Role of the classification society in relation to Flag State requirement.

Loss Causation Model

Loss	Chain of events	Immediate causes	Underlying / Basic causes
Fatal Accident	During stores and provision handling onboard the vessel the monorail crane hoist wire broke. Hook block and pallet fork fell down and hit Chief engineer in the head.	-Hook block hoisted all the way into “block’s” garage -Chief engineer walked under the hanging load -Using defective equipment -Fault in, or failure of technical systems	-Failed to use adequate safety measures -Cramped / inaccessible work place -Inadequate knowledge of crane maintenance -Inadequate control of the crane -Inadequate planning of the work and inadequate pre-work inspection -Inadequate personnel training -Job Hazard Analysis (JHA) not carried out. Risk assessment for such operations not implemented -Lack of routines onboard. Breach of procedures accepted and worker misjudged the potential hazard -Known deficiencies not corrected in time -Experiences from earlier accidents not taken into account. No lessons learned shared -Worker failed to observe and comply with safe working practices

incident action items

Marine Operations Management System – MOMS			
PLAN	***DO***	***CHECK***	***ACT***
▸ Revised MOMS procedures “SP0235 Lifting Gear Operation Procedure”. ▸ Introduced Checklist “Lifting Gear Operation Checklist” into MOMS. ▸ Revised our maintenance procedures in our PMS, incl. establishing a clear 5 yearly renewal of crane wires policy. ▸ Revised SCOPE competencies for Deck and Engine crane operation. ▸ Revised and made Seagull CBT “Lifting gear operation” part of SCOPE. ▸ Created Risk Watch for incident. ▸ Distributed incident report to all vessels.	▸ Requirement of using caution tape to mark hazard area during crane operation. ▸ Clear definition of “person in command” in “SP0235 Lifting Gear Operation Procedure”. ▸ Standard sign protocol introduced in “SP0235 Lifting Gear Operation Procedure”.	▸ Vessel Ship Technical and Safety Inspection template updated with items related to lifting appliances. ▸ Audit of third party manager office and vessel to be carried out. ▸ Improved incident reporting for all in charted vessels.	▸ Will introduce performance review meeting with all time charter vessel operators. ▸ Will include time charted vessels performance into quarterly risk review in 2006.

Main Messages – Crane Operation

- Be familiar with the procedures for safe crane operation
- Plan all operations and actively use risk tools like JHA, Take 5 and Toolbox Talk
- Assign clear roles and responsibilities during crane operation
- Ensure all equipment is well maintained and in good working order
- Always be risk aware – Self and Colleagues
- Stop all operation if unsafe behaviors occure

SAFETY FIRST

Main Messages – Crane Operation

- **Never Compromise Safety at any time!**