

Report from the Division for Investigation of Maritime Accidents

## **Container ship OLUF MÆRSK**

**Accident to seafarer, 5 January 2009,**

## **Crew member injured while handling CO<sub>2</sub>-cylinders**

### **Factual information**

#### **The ship**

OLUF MÆRSK is a container ship of 34,202 GT and a length over all of 247 metres and with a crew of 20.

#### **The accident**

When placing CO<sub>2</sub>-cylinders in racks on the deck, one cylinder, that had not been secured, tilted and hit a crew member who was squatting on the deck right beside the rack. The crew member sustained severe injuries to his head and was taken to hospital.

#### **The crew member**

The injured crew member is 24 years of age. He is qualified in advanced fire fighting, proficiency in survival craft, ratings performing of navigational watch and basic safety training. He signed on the ship as an Ordinary Seaman (OS) on 12 December 2008.

### **Narrative**

*The following in this chapter is based on statements from the master, the chief officer and the able bodied seaman (AB) who was participating in the stowage of CO<sub>2</sub>-cylinders:*

OLUF MÆRSK arrived in San Antonio, Chile, on 5 January 2009 at 0650, and the ship was scheduled to depart from this port on the same day at 2100.

At every call in San Antonio empty CO<sub>2</sub> and oxygen cylinders are exchanged for recharged ones. These gases are used en route for controlling the atmosphere in reefer containers. The exchange of cylinders is normally carried out by the ship's crew, but depending of the number of cylinders, the local Maersk Reefer employees will assist.



The cylinders' placement on the main deck aft of the accommodation



Photo: The ship's master

35 cylinders are placed in transverse racks on the main deck aft of the accommodation on the starboard side as shown on the picture. The rest of the cylinders are to be stowed directly on deck and lashed to the coaming of the aftermost hold.

At this call at San Antonio, apart from the normal cargo operation, the ship was to load some 130 cylinders with pressurized CO<sub>2</sub> and oxygen, each weighing approximately 90 kg. Assistance would be given from the Maersk Reefer employees.

The instructions from the chief officer to the crew were to do this job, however to prioritize provision when arriving. He had planned the work hours for the deck crew so there were at least three persons on deck at a time, of these minimum two being experienced crew members, AB and/or bosun.

At approx. 1730, the chief officer noticed that the loading of CO<sub>2</sub> cylinders was in process, and at approx. 1840 he noticed that the bosun was resting and an AB and an OS were handling cylinders, still assisted by local Maersk Reefer employees.

The AB had joined the team on deck at 1800 as he relived the bosun. He operated the crane and helped securing the CO<sub>2</sub> cylinders in the rack.

The cylinders were loaded by means of a cargo net from ashore and landed on deck right behind the accommodation. The cylinders were thus landed in a horizontal position, from where they were pushed along deck towards the storage rack.



A crew member in the same position as in the situation of the accident

Photo by the ship's master



The bottom of CO<sub>2</sub> cylinders, not firmly standing in the racks

Photo by the ship's master

When placing the CO<sub>2</sub> cylinders in the racks, each cylinder was lying in a horizontal position, and a piece of wood was placed at the end of each rack. Then each CO<sub>2</sub> cylinder was canted with the bottom onto the piece of wood to work them onto the level of the racks in order to shift them into the rack lane.

The AB was holding the cylinder on top while the OS was squatting on the deck holding at the bottom helping to push the cylinder to reach the rack lane. Suddenly at 1935, one cylinder already placed in the rack but not yet secured, fell over and hit the OS who was squatting on the deck. He was hit and contused at his head.

The AB raised the cylinder and secured it with a rope and ran to call the chief officer.

The chief officer arrived at the scene of the accident immediately when called. He found the OS lying on deck next to the racks.

The OS was conscious but shocked and bleeding from his head and face. Two of the local Maersk Reefer employees were with him. The chief officer asked one of them to call an ambulance whereupon he called the master himself and fetched the bandage box to give first aid to the injured OS.

At 1947, an ambulance arrived and further treatment to the injured OS was done by staff from the ambulance. At 2000 he was disembarked on a stretcher by the ship's stores crane and brought to hospital. Medical examinations revealed that he sustained contusion/heavy bruising in his right face orbit, close to the eye, but no fractures.

### **Securing of the CO<sub>2</sub> cylinders**

At the time of the accident four CO<sub>2</sub> cylinders had already been stowed in the rack but not secured. When standing in the stowage rack the CO<sub>2</sub> cylinders get very little support and can easily tilt, when the vessel is listing during cargo operation.

### **Protective helmets**

The crew members were wearing protective helmets during the work with the CO<sub>2</sub> cylinders.

### **Planning and instruction**

According to the master's report this was a standard task carried out at every call at San Antonio. Thus no specific planning of the work was made except that minimum two persons, one of which had to be AB or bosun, were needed for the job.

The ship is holding a risk assessment named "SJA" for Safe Job Analysis. At the time of the accident no SJA was laid down related to the handling of CO<sub>2</sub> and oxygen cylinders.

### **Work hours**

The OS was doing day work, and within 24 hours prior to the accident he had worked for 11 hours.

### **Safety committee meeting**

On 6 January 2009, the day after the accident, an extraordinary safety committee meeting was held on board. The agenda for this meeting was solely to discuss this accident. Various suggestions as to how an accident like this could be prevented were given, and it was agreed that locking pins should be made to be placed on the upper part of the racks in holes already there, thus preventing CO<sub>2</sub> cylinders from capsizing during stowage. Furthermore it was agreed that it is inappropriate that the bottom support on the racks are elevated 9 cm from deck level and thereby making it necessary to lift the cylinders from deck. The work space is confined and stowage of the cylinders should be as easy and safe as possible. Further investigations will be made to see how this issue can be solved.

### **Corrective actions**

As an immediate corrective action locking pins were made to be inserted step by step when stowing cylinders in racks.

After the accident a Safe Job Analysis (SJA) for this job was laid down. The SJA contains possible hazard effects, consequences, descriptions and responsibilities.

The shipping company also conducted an internal investigation in order to find causes, establish lessons to be learned and recommendations to prevent recurrence. That report will be sent to the ships and parties of relevance.

### **Analysis and conclusions**

The rack gave no transverse support to the cylinders if not secured.

When placed in the racks and not yet secured the cylinders could easily tilt because of transverse movements of the ship during loading operations.

At the time of the accident four cylinders standing in the rack were not yet secured.

The CO<sub>2</sub> cylinder tilted because of movement of the ship and because it was not yet secured.

The cylinders needed to be lifted 9 cm from deck and guided into the rack to be stowed.

A crew member was squatting on the deck beside the rack engaged in stowing cylinders in the rack.

The crew member was hit and injured by the falling CO<sub>2</sub> cylinder.

A crew member squatting on the deck just beside the cylinder racks is in a very vulnerable situation and rather exposed to be hit by a tilting cylinder.

No Safe Job Analysis was laid down for this specific task, even though a large amount of CO<sub>2</sub> and oxygen cylinders used to be exchanged at each call of San Antonio.

No specific instructions were given to the crew members regarding this task except that at least two persons were needed one of which had to be an AB or bosun.

The work was not planned and organised to ensure safe working conditions.

The cylinders were not secured one by one because no instruction to do so was given.

## **Recommendations**

The Investigation Division recommends the shipping company to investigate how to handle and store large amounts of CO<sub>2</sub> and oxygen cylinders in a more safe and easy way.

The investigation Division recommends the shipping company to make the Safe Job Analysis that has been worked out for this ship after the accident valid for other ships handling gas cylinders in a similar way.

10 March 2009

Division for Investigation of Maritime Accidents