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Resources Regulator

Investigation report

Forklift attachment injures worker

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Introduction

A worker was injured when a forklift's jib attachment hit him in the mechanical workshop at Cedar Point quarry on 2 March 2024. The jib, and the forklift's tynes and load guard, detached from the forklift which was being used to recover a damaged truck cabin. The worker was standing in front of the forklift at the time of the incident.

The mine

Cedar Point Quarry is an open-cut quarry near Casino in the Northern Rivers area of New South Wales. The quarry is operated by Grahams Quarry Cedar Point Pty Ltd. It produces aggregates that are supplied to local councils and the general public. The quarry employs about 18 workers including truck drivers, mechanics and administration staff.

The incident

An apprentice mechanic was conducting an inspection of a tipper truck and dog trailer in the quarry's workshop on 1 March 2024. The hydraulic tilt lift cylinder detached from its mount as the worker tilted the cabin forward. This caused the front and top of the cabin to impact the ground.

Figure 1: Truck cabin in contact with the workshop ground

The quarry operator's managing director, safety officer, mechanic and apprentice mechanic arranged to raise the cabin into a position that would permit the hydraulic arm to be reattached on 2 March 2024. The group decided the safety officer would operate the quarry's forklift to undertake the task. A rail on the forklift's load guard was damaged previously but had not been repaired. The forklift had a load rating of 2,500 kilograms.

Figure 2: Previous damage to forklift's load guard

A 2.9-metre-long jib was attached to the forklift's tynes. The jib was ordinarily used at the quarry to lift items weighing much less than the truck cabin. Chains were used to connect the jib at 2 points on the underside of the truck's cabin. The weight of the cabin was not obtained by those involved in the lift and no specific assessment was undertaken to determine the effect that use of the jib attachment would have on the forklift's load rating.

The cabin was initially raised about 0.5 to 1 metre above the ground. The mechanic was standing in close proximity to the forklift and jib attachment and about 0.4 metres from the side of the truck. The other workers were also in close proximity to the truck. The safety officer raised the jib around a further 0.2 to 0.3 metres above its original raised position. The jib was about 2.5 metres above the ground at this point

The fork headboard/load guard detached from the body of the forklift. The forklift's tynes also detached from the fork headboard/load guard, causing the tynes and the forklift end of the jib to swing in a forward and downward motion. The far end of the jib was suspended by the chains that remained attached to the underside of the truck's cabin.

The unrestrained end of the jib hit the mechanic's leg causing him to fall to the ground. The tynes remained within the jib pockets and hit the ground in close proximity to the mechanic. The fork headboard/load guard and the jib remained suspended above the mechanic as he lay on the ground.

The worker suffered spine and leg fractures in the incident.

Figure 3: General location of worker and the movement of the jib/tynes

Investigation

The Resource Regulator's Major Safety Investigation Unit investigated the incident to determine its cause and circumstances.

The investigation found several factors contributed to the worker being exposed to the risk of serious injury or death, including the following:

1. The jib, which was manufactured by the quarry's operator and was never rated for use with the forklift
2. A design risk assessment of the jib was not undertaken
3. The introduction to site processes for the jib failed to identify the full range of tasks that the attachment would be used for at the quarry
4. No procedures were developed for the safe use of the jib.
5. Neither the forklift nor the jib were affixed with an information plate containing crucial information about the jib including its load rating when attached to the forklift. There was no other information available to forklift operators at the quarry about the safe working load limit of the jib nor the forklift/jib assembly.
6. Workers at the quarry had limited understanding about how and when to conduct risk assessments

7. The task-specific risk assessment undertaken before the incident was inadequate given the complexity of the lift involved. It failed to identify and manage the risk of equipment failure or the risk of standing in the line of fire of a suspended load
8. Planning for the task was inadequate and resulted in the workers not having a common understanding about how the lift would be performed to safely recover the cabin. The safety officer did not contemplate the need to move the forklift rearward during the lift to avoid introducing side loading forces, whereas other workers expected him to do so
9. The truck cabin's weight exceeded the working load limit for the jib at the lifting point used
10. The quarry operator did not provide training to forklift operators at the mine nor undertook any assessment of their competency to safely:
    a. operate forklifts
    b. use the jib
    c. assess working load limits when using forklift attachments.
11. Exclusion zones were not established and maintained. As a result, workers stood close to the truck cabin in the potential line of fire while it was lifted
12. The wheels of the forklift remained stationary during the lift. This, coupled with the orientation of the forklift and jib relative to the truck cabin's pivot point, introduced side loading forces
13. Forklifts are not designed to sustain side loads. The separation of the load guard/tynes assembly was likely to have been caused by the introduction of side loads
14. The pre-existing damage to the fork headboard/load guard may have contributed to the failure of the load guard/tynes assembly.

Recommendations

Quarry and mine operators are reminded of their duty to identify hazards and manage risks to health and safety in accordance with provisions of the *Work Health and Safety Act 2011* and *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and Regulations.

In particular, quarry and mine operators must ensure that

a. plant, equipment, machinery and associated work tasks are the subject of adequate risk assessments:
   i. directed to:
      - the identification of reasonably foreseeable hazards
      - risks arising from reasonably foreseeable hazards
      - measures to control risks in accordance with the hierarchy of controls.

   Refer to the Code of practice – how to manage work health and safety risks

ii. that take into account:

- information provided by the original equipment manufacturer
- regulatory requirements concerning risk management and plant
- authoritative material such as, in the case of the use of forklift attachments, the Safe Work Australia – General Guide for Industrial Lift Trucks, Australian Forklift and Industrial Truck Association - Engineering Guidance Note Attachment Selection and Forklift Compatibility, Australian Standards and similar

b. fabricated forklift attachments are designed, assessed and certified by a competent person such as an engineer and are suitable for the load to be lifted or moved

c. forklift attachments such as jibs are designed, rated and maintained to safely function with the particular forklifts that they are intended to be used with

d. the stability and lifting capacity of forklifts, (when fitted with rated and certified lifting jibs), are known with the load's centre of gravity relative to the forklift. This should be factored into pre-lift planning and risk management processes to avoid side loading

e. workers are not positioned in the path of suspended/moving loads or equipment and performing work in the line of fire when undertaking lifting activities

f. forklift operators are competent and provided with adequate information and training relating to calculating safe lifting loads, including education about the reduced load capacity when forklift attachments are used

g. forklift operations are adequately supervised by a competent person.

Quarry and mine operators must also:

- develop and implement a safe system of work in relation to the operation of forklifts to ensure that risks to operators and other workers are eliminated or minimised so far as reasonably practicable
- establish and maintain suitable exclusion zones that appropriately account for the potential for suspended loads to drop, swing and topple.

When using a jib attachment ensure:

- the capacities for each rated lifting points along the jib are clearly identified by the manufacturer on a permanent plaque affixed to the jib
- that information is provided to forklift operators about the determined load capacities for the forklift when used with the attachment.

Workers are reminded of their duty to take care for their own health and safety and that of their co-workers. They must also comply with reasonable work instructions, policies and procedures.

In particular, workers must:

- be aware of their surroundings and ensure that that they do not position themselves under, or within, the drop, swing or topple zone of suspended loads or lifting attachments.
- ensure that they are competent, licensed and capable of determining relevant load ratings before operating a forklift fitted with a lifting jib.
- comply with safe work procedures, hazard identification and risk management processes, and always wear appropriate personal protective equipment while working within hazardous work environments.

Further information

Please refer to the following guidance materials:

- Australian Standard 2359 – 2013: Powered industrial trucks. Part 2: Operations
- Model Code of practice: Managing the risks of plant in the workplace (Safework Australia)
- Forklifts - Information sheet for owners and operators (Safework Australia)
- General guide for industrial lift trucks (Safework Australia)
- MDG 15 - Mobile and transportable plant for use on mines and petroleum sites