



A combined State Coroner's Office and Victorian Institute of Forensic Medicine publication.

The Work-Related Liaison Service presents:

# WORKWISE

WORK-RELATED DEATH PREVENTION: THE CORONIAL APPROACH

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## EDITORIAL

Injury prevention relies on a collaborative approach, particularly where design factors influence workplace safety. The coroner, combined with industry bodies and researchers, can be a powerful collaboration to advance effective design solutions in the workplace.

This edition focuses on design, as both a risk factor for, and solution to injury in the workplace. Examples have been drawn from previous coroners' investigations of the hazards associated with forklifts and their control through design interventions.

A reduction in forklift-related deaths has occurred in Victoria over the past twenty years. From a peak of eight forklift-related workplace deaths in 1988, no more than two deaths per year have occurred since 2005. This may be credited largely to design solutions to protect both operators and bystanders. Such solutions include safe seating zones and restraints, designated traffic zones, maximum lifting heights and load limits, coupled with operator training and certification.

Hazards within the work environment, such as pedestrian safety in areas of mobile machinery operation, can also be rectified through safe design. A case example of the interaction between pedestrians and forklift operations is reported.

We are also fortunate to have a contribution from Dr George Rechnitzer, Principal Forensic Engineer and Director of Delta-V Experts, whose research has contributed significantly to the body of knowledge on forklift safety. Dr Rechnitzer discusses the influence of design in occupational safety on page 3.

## ADDITIONAL RESOURCES

WorkSafe Victoria has produced a number of publications on forklift safety that can be access via their website:-

<http://www.workcover.vic.gov.au/wps/wcm/connect/WorkSafe/Home/Safety+and+Prevention/Health+And+Safety+Topics/Forklifts/>

*DISCLAIMER: All cases that are discussed in **WORKWISE** have been formally closed by a coroner. Every attempt has been made to de-identify individuals or groups.*

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## SIMPLE SOLUTIONS TO OPERATING HAZARDS

**Case Number:** 0170-03

### Incident Summary:

Mr R was a 46 year old male who was employed on a casual basis as a labourer. On the day of his death, Mr R was transporting a traction motor to a nearby location using a forklift. While travelling up an incline, the forklift tipped to the left and Mr R was crushed by the top of the roll cage as he attempted to jump clear. He died as a result of multiple injuries.

### Investigation:

The coroner's investigation identified a number of key factors that contributed to the fatal incident.

Mr R had used a lifting sling that was too long and had not effectively secured the traction motor. As a result, it was able to swing and shift the centre of gravity of the forklift to the left.

Mr R had to operate the forklift up a slight incline, and approached this incline on an angle. The forklift arms were raised to three metres and were moved to the left to allow for clearer vision. The coroner commented that although this procedure was usual practice, it contributed to the forklift's centre of gravity shifting in this incident.

Additionally, all of the forklift tyres were under-inflated which further contributed to the instability of the forklift.

### Findings and Recommendations:

A member of the Victoria Police investigated the circumstances of Mr R's death and made the following recommendations, which were adopted by the coroner in his finding:

1. *Seatbelts to be fitted to all forklifts to secure the driver;*
2. *"Wings" to be fitted to both sides of the forklift seat to prevent the driver falling out due to roll over;*
3. *Continuous safety training and bi-yearly assessments of persons using forklifts; and*
4. *Solid tyres to be used on forklifts instead of inflatable tyres.*

The coroner also commented that Mr R 'was an experienced forklift driver...[whose] accident is one due to a combination of circumstances that unfortunately resulted in his death'.



## SAFETY IS BY DESIGN, NEVER BY ACCIDENT

We see in many investigations and Coronial Investigations in particular, the contribution of design inadequacies [in combination with human behaviour] resulting in fatal and serious injury outcomes. While such investigations and research identify areas for design improvements, it is amazing the resistance that is often met for practical, well understood interventions.

Significant advances have been made in the last decade on forklift safety, with Worksafe Victoria actively promoting improved forklift design and also facility design, including the need for traffic management and pedestrian exclusion zones. Much of the impetus for these improvements came in the early 1990's out of Coronial Inquests and forklift safety research at the Monash University Accident Research Centre.

On the other hand, I am always impressed to see the advances in equipment and system design, when people and companies are motivated to solve problems and provide practical solutions. In design everything counts towards an improved solution, from the design concept through to the smallest detail. Designs can fail at two levels: either the system is inadequate and/ or the detail design execution is inadequate. A good design is very demanding; it must address functionality, manufacture, maintenance and operational performance, and most designs are an evolution, with improvements often coming in future models, provided the needed design criteria are diligently set.

There is a powerful synergy formed by the combination of the coronial system and research carried out by specialist groups or companies, supported by agencies such as WorkSafe that can help the implementation process for findings.

It is exciting to see safety improvements implemented and I think good design is appreciated by most people, particularly when it quietly assists functionality and efficiency, but also reduces risk. I give three examples. One relates to electric cords, where we all remember the frayed and dangerous ends of power plugs due to people pulling on the cords. The solution was beautifully simple but took many years before it was seen on appliances – the plug end was modified to include a loop which people could easily grip and pull on thereby not loading the cable. The second is a forklift with a rotating turret to give excellent visibility in all directions, as lack of driver visibility has been a key safety issue with forklifts. The third is the implementation of side gates for forklifts to help keep drivers in the cabin in the event of a tip-over. Safe designs never occur by accident, but require deliberate quality attention.

**Dr George Rechnitzer,**  
Delta-V Experts [[www.dvexperts.net](http://www.dvexperts.net)]

### References

For further information and images of innovative forklift design, please visit:  
IWS PilotProtector: <http://www.iws-mbh.de/pilotprotector.html?&L=2>

Jungheinrich Lift Trucks: <http://www.jungheinrich-us.com/en/us/index-us/products/industrial-trucks/counterbalanced-trucks.html>



## NOT DESIGNED FOR PASSENGERS

**Case Number:** 3859-04

### Incident Circumstances

Master D, a 12 year old student, was playing at his father's workplace. Master D repeatedly requested an employee at the business to let him ride on a forklift. Finally giving in, he was allowed to sit on the forklift as a passenger while the employee operated the vehicle. Master D sat to the right side of the driver, just above the engine of the forklift. The vehicle was not designed to carry passengers.

While the driver of the forklift was making a U-turn at the work premises, the accelerator was pressed by Master D, causing the wheel of the forklift to hit an open storm drain. Master D was thrown from the vehicle, caught between the forklift and brick wall, suffering fatal chest injuries.

### Coronial investigation

The coroner stated that this was another case highlighting the dangers of using machinery and other industrial equipment for purposes other than for their intended purpose.

The need for children to be accommodated appropriately when visiting workplaces was recognised by the coroner. Further, not only was the forklift not designed to carry passengers, it should never have been used as entertainment, especially for children visiting the workplace.

The coroner recommended that WorkSafe Victoria give consideration to a public awareness campaign, highlighting the dangers of unsupervised children in the workplace, including the dangers presented by the inappropriate use of machinery, particularly forklifts.

## PEDESTRIAN SAFETY THROUGH 'WORKFLOW DESIGN'

**Case Number:** 0108-00

### Incident Circumstances

A forklift operator was in the process of stacking crates from a shipping container onto the tray of a semi-trailer at a work premises. The driver of the truck was positioned on the opposite side of the trailer awaiting completion of the loading task.

The truck driver was not instructed to move away from the operating area into a safe position, such as the truck cabin or tea room.

The forklift operator commenced the loading procedure unaware of the truck driver's position due to a lack of visibility. The load inadvertently fell from the trailer and struck the truck driver, inflicting fatal injuries.

### Coronial investigation

A lack of strict supervision and workflow design to avoid pedestrians and forklift interaction in loading areas was recognised in the coroner's investigation.

The coroner identified an absence of regular supervision of the loading operation by either the management of the premises or the transport company. The coroner also noted the forklift driver was not in possession of a Certificate of Competency to operate a forklift.

Induction booklets were in the possession of both companies warning all staff of the dangers of personnel working in the vicinity of forklift operations.

Both companies were aware of the risks associated with loading procedures, although neither had adopted specific work practices aimed at identifying hazards of work activities and managing the risks. As a result, no process was in place for supervising the work task and ensuring the separation of pedestrians from the vicinity of loading and unloading procedures.