



## Significant Incident Report No. 210

**Subject:** Electrician crushed between lift car and lift shaft structure - fatal accident

**Date:** 15 December 2014

### Summary of incident

*Note: The Department of Mines and Petroleum's investigation is ongoing. The information contained in this significant incident report is based on materials received, knowledge and understanding at the time of writing.*

An electrician received fatal injuries when he was crushed between a lift car and the lift shaft structure and then fell to the bottom of the lift shaft.

A maintenance request had been raised for a service lift located in a powerhouse building. The lift had stopped moving and some of the doors on the lift shaft were not closing. Two electricians were sent to troubleshoot and fix the problems.

After an initial inspection of the lift, the electricians went to the lift motor room located above the lift shaft. To get the lift moving again to help identify the problems, they bridged (i.e. bypassed) sections of the lift control circuit.

One electrician left the motor room and went downstairs to the top floor where the lift car was situated. He rode the car down to the ground floor to check if the shaft doors were closed.

The other electrician subsequently went to the shaft doors on the top floor. He tried to contact his colleague on the radio a few times and then by telephone, but could not get a response. He then went downstairs to the ground floor where he found the lift shaft doors open, but no sign of the lift car. His colleague was lying on the bottom of the lift pit.

### Direct causes

- Sections of the lift control circuit had been bridged and the lift car was not isolated.
- The lift may not have been in maintenance mode.
- Part of the electrician's body was projecting outside the lift car when it moved upwards.

### Contributory causes

The preliminary investigation by the Department of Mines and Petroleum has been unable to definitively determine why the lift car unexpectedly moved upwards. However, a number of factors relating to work environment, safe systems of work, competency and supervision may have contributed to this fatal accident.

## Work environment

The lift involved in the incident is one of nine installed on the site in 1988, with three lifts installed later. The original nine lifts are similar with only minor differences between them.

- Since 2010, there had been 400 breakdown notifications for the 12 lifts, including 42 for the lift involved in the fatal accident.
- Scheduled maintenance is carried out by one site electrician working with the lift manufacturer's contract technicians.
- Breakdown troubleshooting and repairs on site are typically conducted by shift electricians. They have little or no formal training in lift maintenance, and learn on the job from more experienced electricians.
- The majority of shift electricians could not correctly identify the position of the lift maintenance switch when shown a photograph of the maintenance switch on the lift involved in the accident.

## Safe systems of work

### *Safe work instruction*

- There was a safe work instruction (SWI) for lift electrical maintenance but it did not cover all aspects of the breakdown troubleshooting undertaken by electricians.
- There was no reference in the SWI about:
  - the need to bridge some of the lift control circuits (and how to do this safely)
  - the potential for crushing hazards when the lift moves
  - the requirement for two people to undertake certain tasks (and the communication set-up).

### *Risk assessments*

Lifts have moving parts with potential crush hazards — electricians deal primarily with electrical hazards.

- Shift electricians often did not write job hazard analyses (JHAs) or individual risk assessments.
- JHAs were not stored or reviewed after the work had been completed. They only required supervisor approval if the resultant risk was considered to be above "low".
- There appeared to be an established practice of using verbal or mental risk assessments.

### *Bridging of control interlocks*

There are circumstances in lift maintenance and breakdown troubleshooting that require temporary bridging of safety circuits so the lift can be moved to an accessible position.

- While the shift electricians used bridging approval forms, some had not read the whole site procedure covering the bridging of control interlocks.
- The lifts had been treated separately from the rest of the site's plant. It was commonly believed a bridging approval form was needed for equipment, but not lift control circuits.

## Competency and supervision

- There appeared to be no formal system in place to check that electricians were correctly using SWIs, JHAs and individual risk assessments.

- None of the four electricians on the crew rostered for the day of the fatal accident were familiar with the SWI for lift electrical maintenance. However, electricians on the other crews were aware of the SWI.
- The supervisor had been appointed less than three months before the accident, and had not worked in a supervisory role, nor received formal training as a supervisor before this appointment.
- The line superintendent had been in the role less than one month before the accident.

## **Actions required**

The hazards that maintenance workers are exposed to can change with each job step. Unless the troubleshooting and fault-finding steps are planned beforehand, then it will be difficult to assess the risk of each step and implement controls.

- Employers should ensure their safe systems of work also deal with maintenance activities that cannot be carried out with the equipment completely de-energised, such as inching, jogging, testing and troubleshooting live equipment.
- Supervisors and workers should check that SWIs are provided that cover the specific work to be undertaken. They need to take the time to risk assess each step of the job and confirm that the work plan identifies and controls all hazards. If there are changes to the SWI, these need to be reflected in a JHA.

The risks associated with maintenance or troubleshooting on lifts and hoists are not new or unique to mining. Employers with lifts or hoists at their operations should review the comprehensiveness and currency of their systems of work. Particular care is required when troubleshooting, especially if a control circuit needs to be bridged, which allows the lift or hoist to move, potentially exposing workers to crush hazards.

## **Further information**

Visit [www.dmp.wa.gov.au/ResourcesSafety](http://www.dmp.wa.gov.au/ResourcesSafety) for information on occupational safety and health in the resources sector, such as the toolbox presentations, guideline and report listed below.

- Assessing the risk within the task  
[www.dmp.wa.gov.au/documents/Powerpoint\\_presentations/MSH\\_MSR\\_2014AssessingRiskTask](http://www.dmp.wa.gov.au/documents/Powerpoint_presentations/MSH_MSR_2014AssessingRiskTask)
- Review of fatal accidents on WA mines 2000-12  
[www.dmp.wa.gov.au/documents/Powerpoint\\_presentations/MSH\\_MSR\\_2013ReviewFatalAccider](http://www.dmp.wa.gov.au/documents/Powerpoint_presentations/MSH_MSR_2013ReviewFatalAccider)
- Effective safety and health supervision in Western Australian mining operations ' guideline  
[www.dmp.wa.gov.au/documents/Guidelines/MSH\\_G\\_EffectiveSafetySupervisionWA.pdf](http://www.dmp.wa.gov.au/documents/Guidelines/MSH_G_EffectiveSafetySupervisionWA.pdf)
- Fatal accidents in the Western Australian mining industry 2000-2012 report  
[www.dmp.wa.gov.au/documents/Reports/RP\\_FatalAccidentsMINING\\_2000-12.pdf](http://www.dmp.wa.gov.au/documents/Reports/RP_FatalAccidentsMINING_2000-12.pdf)

This Significant Incident Report was approved for release by the State Mining Engineer on 15 December 2014