

SAFETY ALERT

Concrete batching

A worker at a batching plant has received serious and permanent injuries following an uncontrolled release of cement dust during a concrete batching operation.

Background

The worker was in the control room of a batching plant monitoring the flow of cement dust from a silo into a weigh hopper. When the hopper reached the desired weight the operator activated a lever to stop the flow; however, a pneumatic butterfly valve, located at the top of the 'sock' connecting the silo to the hopper, did not close and the cement dust continued to flow. The rubber 'sock' split soon after and cement dust discharged over the area including the batch plant control room.

The worker initially left the control room as it began to fill with dust, but returned to make further attempts to activate the lever and stop the flow. As a result of inhaling cement dust, the worker has suffered significant loss of lung capacity, and has since been diagnosed with Chronic Obstruction Pulmonary Disease. The worker has been unfit for duty since the incident.

Contributing factors

The cause of the fault in the butterfly valve, located at the top of the 'sock', could not be determined. However, it is believed the following factors contributed to the severity of the incident:

- There was no system of work to deal with an uncontrolled discharge of cement dust.
- There were no dust masks available in the control room.
- The design of the batching plant meant the control room was located almost immediately below the weigh hopper and was quickly engulfed by the discharging cement dust.
- The design of the batching plant meant that workers were not able to operate the valve at the base of the silo from the ground.
- The butterfly valve at the top of the 'sock' was not the self closing type, requiring pneumatic pressure to both open and close.

Action required

Persons in control of a business or undertaking involved in batching, must so far as is reasonably practicable, ensure that workers and other persons are not exposed to hazards and risks arising from exposure to cement dust, and take action to eliminate or minimise the risk of the uncontrolled release of dust within their workplace.

Exposure to cement dust can irritate eyes, nose, throat and the upper respiratory system. Skin contact may result in injury ranging from moderate irritation to thickening/cracking of skin to severe skin damage from chemical burns. Silica exposure can lead to lung injuries including silicosis and lung cancer.

Duty holders and workers at batching plants should consider the following control measures:

- Have emergency procedures in place to deal with unexpected release of cement dust. These procedures should allow for workers to contain a release without exposing them to undue risk during the containment or cleaning up afterwards.
- If possible, locate control rooms a safe distance from any areas where loading, storage, conveying and mixing of cement dust and other concrete additives occur to prevent engulfment if cement dust is discharged.
- Use self-closing flow control valves (eg spring loaded) that revert to the closed position if there is a fault in the actuation system.
- If possible, incorporate manual activation or override controls that can be operated at ground level to valves controlling the flow of cement dust.
- Where there is a risk of a bursting 'sock', encase the sock within an additional reinforced connection between the silo and the hopper. This will provide containment if the sock fails.

In addition to the above, duty holders and workers should consider the following practices when working with or near cement or other potentially hazardous dusts:

- Have protective clothing available and wear masks where there is a risk of inhaling dust.
- Clean the workplace regularly by vacuuming or wet sweeping.
- Wear disposable or washable work clothes and shower if facilities are available.
- Vacuum dust from work clothes and change into clean clothing before leaving the work site.
- To avoid ingesting cement dust, do not eat, drink, smoke or apply cosmetics in areas where dust is present. Wash hands and face outside of dusty areas before performing these activities.
- Participate in training, exposure monitoring and health screening and surveillance programs to monitor any adverse health effects caused by cement or other potentially hazardous dusts.

Further information

The *Work Health and Safety Act 2011* (WHS Act) requires persons in control of a business or undertaking at a workplace to ensure, so far as is reasonably practicable, that workers and other persons at a workplace are not exposed to risks arising from the business or undertaking and that all staff are adequately trained and supervised.

Clauses 34 to 36 of the *Work Health and Safety Regulation 2011* (WHS Regulation) places specific obligations on duty holders to identify reasonably foreseeable hazards associated with work being undertaken, and then manage risks accordingly.

- European Standard IS EN 12151: *2007 Machinery and Plants for the Preparation of Concrete and Mortar – Safety Requirements*.
- Cement Concrete & Aggregates Australia Data Sheet *Working safely with dry concrete materials* available at www.concrete.net.au/publications/pdf/Dry.pdf
- United States Department of Labor Pocket Guide *Concrete Manufacturing* – available at http://www.osha.gov/Publications/concrete_manufacturing.html
- workcover.nsw.gov.au or phone 13 10 50.

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