



Department of Consumer
and Employment Protection
Government of Western Australia

Resources Safety 

Mines Safety

Significant Incident Report No. 146

Hazard posed by cyclone draw in RC drilling

Incident

A reverse circulation (RC) drill rig was drilling a grid of 40 to 50 metre deep holes at an exploration site in Western Australia. The holes penetrated the groundwater table.

In dry ground, the sample splitter beneath the cyclone was used to collect a representative sample fraction. During this process, the large plastic sample bag had been sucked up inside the base of the splitter by the dust suppression fans on a number of occasions. When this occurred, the offsider instinctively reached up inside the splitter and pulled the sample bag out.

When wet ground was encountered, or when water was injected into the drill string, the sample cuttings tended to block the splitter. This led to the splitter being removed from the base of the cyclone and the large plastic sample bag being held over the mouth of a short adaptor cone beneath the cyclone draw.

The cyclone draw is a sliding steel plate that controls the discharge of the sample cuttings from the cyclone.

While drilling was in progress, with the splitter off, the plastic sample bag was again sucked up, this time inside the cone and into the draw. The offsider did what he had done before — reached up, this time inside the cone, to pull the sample bag out.

At the same moment, the driller, while looking at the controls, closed the draw. The sliding steel plate of the draw trapped three fingers of the offsider's right hand. On opening the draw, it was found that the three fingers had been amputated.

Cause

The sliding draw, beneath the cyclone, is a potential pinch point. With the sample splitter in place, this potential pinch point cannot be accessed.

With the splitter off, the length of the cone beneath the cyclone was such that it was possible for a person to reach up inside the cone and place their hand in a potential pinch point — the path traversed by the sliding steel plate of the draw.

Thus, when the splitter was not in use it was possible to access this potential pinch point.

Comments and preventative action

Exploration companies and drilling companies must review their RC drilling procedures to ensure that employees engaged in RC drilling operations are not exposed to the particular hazard posed by a sliding draw beneath the sample cyclone.

The two main reasons for error are that as creatures of habit we do what worked last time and we skip steps when we are in a hurry (Flight Safety Australia, Nov-Dec 2003, p. 38-41).

This needs to be recognised by employers and employees alike. Where there are slight changes in work procedures — in this situation, with and without the splitter installed — the exposure of employees to hazards can change dramatically. What may have been a safe system of work with the splitter installed was not when the splitter was removed.

With the splitter removed, the offsider did what worked last time, when the sample bag got sucked up, the offsider instinctively reached up this time inside the cone to retrieve the bag, with disastrous results.

The control measure adopted was to engineer out the hazard by:

- making it much more difficult to access the potential pinch point; and
- adding hydraulic interlocks to prevent operation of the draw under certain conditions

The original adaptor cone is shown in photograph 1.

A new cone was fabricated that is much longer than the original cone, as shown in photograph 2.

In addition, two hydraulic interlocks were installed to prevent inadvertent operation of the draw.



Photograph 1: Sample bag attached to original cone



Photograph 2: New cone, which is much longer than the original cone

M J Knee
STATE MINING ENGINEER

12 December 2007

A431178 RSD1207/2007/1
Corrected 5 February 2008