



## INGRESS OF WATER INTO ELECTRICAL EQUIPMENT

### Introduction

Figure 1 shows the quarterly distribution of 304 mining industry electric shocks reported in the period 1 July 1995-30 June 1997, and an alarming proportion of incidents directly attributable to the entry of water into equipment.

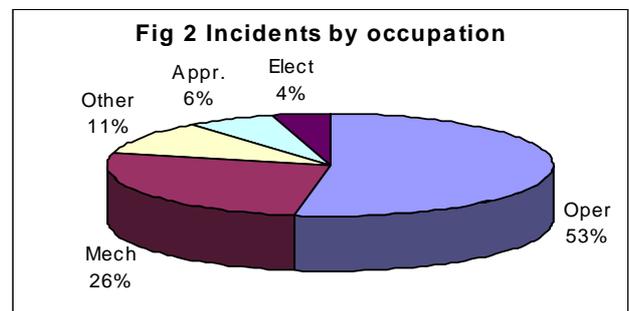
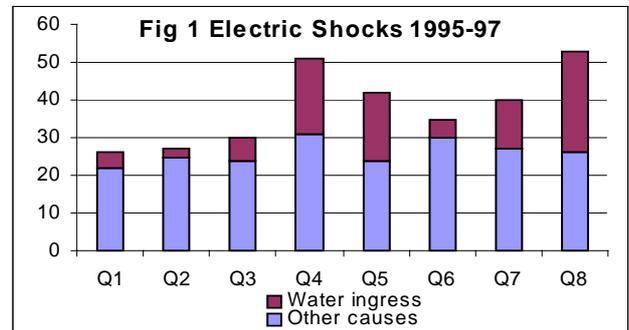
The chart highlights a strong trend that correlates with seasonal rainfall, and illustrates that up to 50% of all electric shocks in winter are caused by water ingress.

The spread of incidents across occupations is shown in Figure 2 which demonstrates that operating staff receive far more electric shocks than other work groups. Incidence rates in each regional area are similar and only one incident occurred underground.

### Incidents and causes

A study of the 95 electric shocks revealed:

- 25 were caused by the use or handling of portable electric tools and extension leads that had become wet, either by splashing or by being left out in the rain.
- 23 shocks arose when pushbuttons were operated on stop/start stations and crane pendant controls that were later found to be full of water.
- 18 incidents involved general fixed plant such as motors lighting and switches, all of which had suffered water ingress.
- 13 resulted from operating equipment or switches with either wet hands or gloves.
- 8 involved the handling of 'decontactor' plugs that had become internally wet; and
- 8 others occurred whilst equipment was being hose cleaned or immediately following.



### Comments and Preventative Action

Australian Standards (AS) 1939 describes the 'IP rating' system for preventing water entry into equipment, and a comparison of the specified tests with typical mining conditions will show that the 'hoseproof' claims by some manufacturers to be dubious. Hosing is not an acceptable means for cleaning electrical equipment and the practice must cease.

Electrical workers are reminded of their duty to select, install and maintain outdoor equipment properly.

In general, portable tools and extension cords are not weatherproof, and any that have become wet must be switched off (with a dry hand) removed from service and tested before use. Use of RCD earth-leakage protection is mandatory, as is the reporting of defective equipment.

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