



**DEPARTMENT OF MINES
WESTERN AUSTRALIA**

SIGNIFICANT INCIDENT REPORT NO. 4

WELDING EQUIPMENT ELECTROCUTION – FATAL ACCIDENT

INCIDENT

A trades assistant received a fatal electric shock from welding apparatus being used in an industrial workshop.

The equipment involved was a manually operated, transformer type, mobile electric arc welder. Exposed metal parts of the equipment and the associated welding circuit became 'alive' at 240 volts due to an electrical fault in the primary mains supply cable.

CAUSE

The primary cause of this accident was an electrical fault resulting from mechanical damage to the mains supply cable. The particular nature of the fault caused the metal frame of the equipment to become 'alive' and also prevented the protective earthing and fuses from operating.

COMMENTS AND PREVENTATIVE ACTION

Examination of the 'stranded' PVC/PVC supply cable revealed an open circuit of the earthing conductor, a phase to earth fault and evidence of internal arcing approximately half way along its 12 metre length. The 'stranded' cable in question was unsuitable for the application and should have been 'flexible' in construction as required by A.S. 3000-4.18.2. Flexible cable is designed to accommodate repeated flexing and affords a higher tolerance of rough usage. Regular checks should be made of all such cabling on portable/mobile equipment, including units fitted with ready disconnect plugs, to ensure correct application. Care must also be taken to protect against mechanical damage.

Inspection of the welding transformer disclosed that the welding circuit was not insulated from the equipment frame due to replacement of an insulating bush with a metallic washer at the 'work' output terminal. The requirement is specified in A.S. 1966.1 Clause 1.5.2. and is essential to prevent return welding currents from damaging system earthing conductors.

To adequately ensure safety, all electrical equipment requires to be regularly examined and tested. Emphasis must be placed on carrying out an insulation/earth continuity test with an appropriate instrument to expose potentially hazardous defects which may not be visually apparent.

J M Torlach
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SAFETY AWARENESS SAVES LIVES