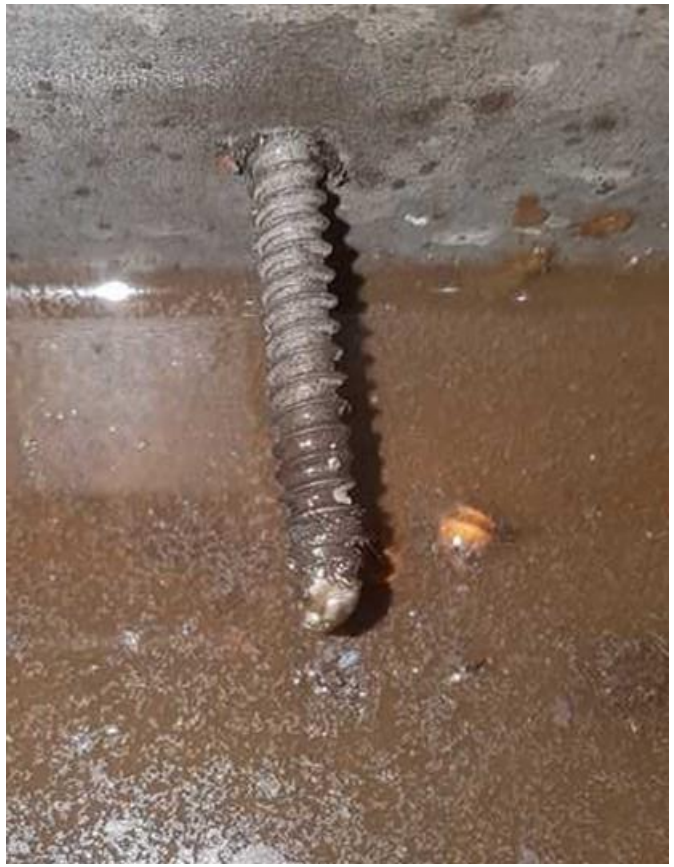
MONTHLY ELECTRICAL INCIDENTS

ASP Manufacturing

June 2020

A plumber repairing water pipes noticed a cable running parallel to pipes to be embedded with a wall cladding screw. The cable had been run on top of horizontal wall purlins installed in the early 70s. The cable, a 4C+E 16mm^2, was supplying a three phase outlet with all three phases still energised. A close inspection of the cable found the screw had penetrated the white phase, the tip of the screw has melted and separated from the conductor and blown the fuse. The belief is that the fuse has been replaced as cable damage could not be found, and the circuit has been in service since.
Care must be taken to ensure cables are installed with adequate protection, follow the Electrical Installation manual and AS3000.



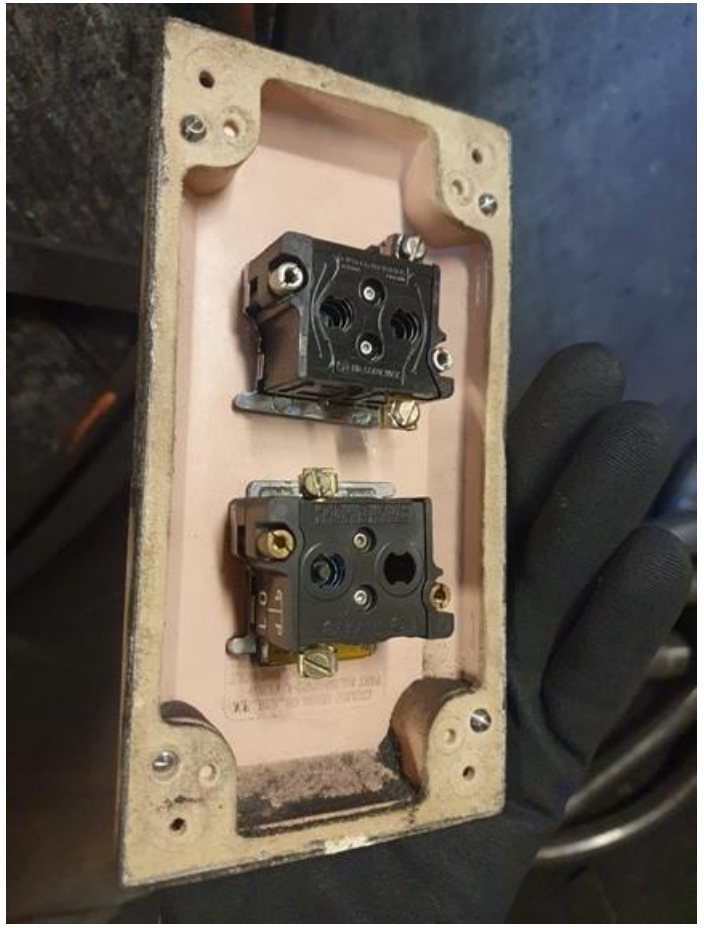
The wall cladding screw with the melted tip.

The damaged cable with the outer sheath removed showing the damage to the white phase.

The damaged cable as found.

Electricians completing routine maintenance on Stop/Start pushbutton stations found the door gasket to be a fibrous type material. The gasket was tested and found to contain Chrysotile Asbestos. The brand is Crouse Hinds and was installed in aproximately1987.
Older electrical equipment may contain hazardous substances such as Asbestos Containing materials (ACM), follow asbestos management procedures whenever suspect material is encountered. Equipment suspected of containing hazardous substances must be identified and managed, refer Electrical Safety Manual section 1.4.2.4 and site specific hazardous substance management procedures.

The Crouse Hind Pushbutton Station.



The inside of the front cover of the Crouse Hind Pushbutton Station.

A close up view of the gasket

Two examples of old heaters being used without adequate inspection and testing, leading to damaged plugs and sockets. In one case the neutral pin of the heater lead remained stuck in the socket outlet whilst it was being removed, in the other case both the active and neutral pins remained stuck in the socket due to overheating at the outlet. Both electric heaters were old and should have been removed from service. The compliance tags had expired and the outlet sockets had poor spring tension resulting in high contact resistance.
As per Electrical Safety Manual section 1.4.11 all portable electrical appliances should have a visual inspection on a regular basis to confirm they are fit for duty. In cases where the equipment is permanently plugged into an outlet the equipment should be inspected when a compliance test and tagging is being conducted. Outlets should be inspect when the RCD compliance test is conducted.

The plug of the lead with the neutral pin missing and showing signs of heat.

The socket outlet with the neutral pin still inserted

Both pins of the moulded plug of the heater show signs of heat and melted plastic.

Note the melted marks on the socket outlet

A forklift moving in the reverse direction with a large wide load has struck the Torpedo ladle turning outlet station. The extension lead coming from the outlet station to a Torpedo ladle has been damaged leaving exposed conductors. Fortunately at the time of the incident the outlet station isolator was turned off.
Extra care should be taken with mobile machinery near electrical equipment, if the driver is unsighted then an observer should be used.

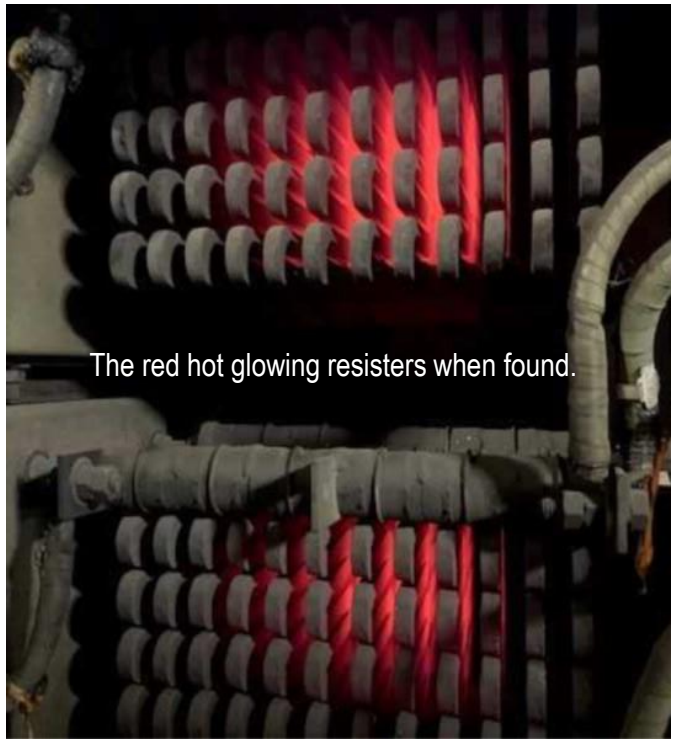
The Torpedo ladle turning outlet station front view.

The Torpedo ladle turning outlet station rear view.

Note the point of contact with forklift load

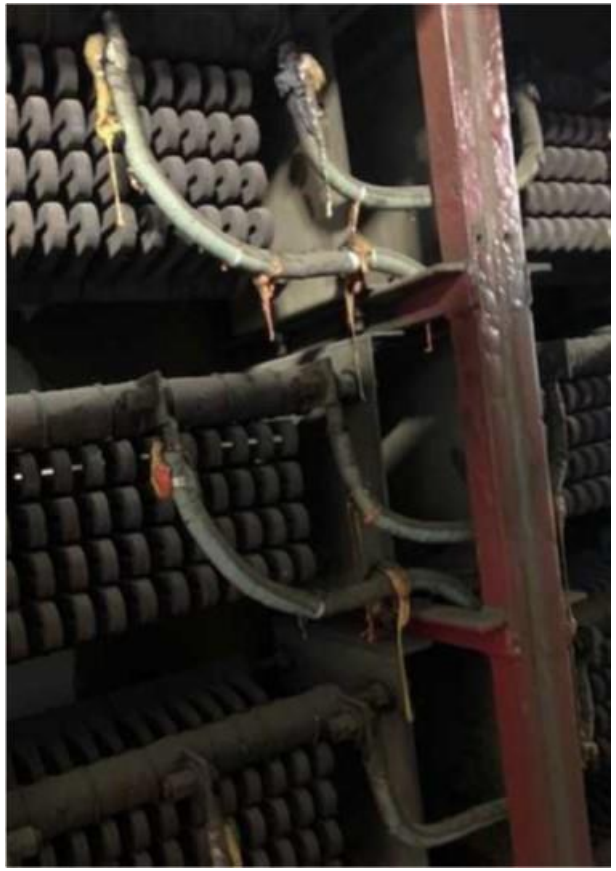
Close up view of the cable damage and exposed conductors

An operator observed smoke coming out of CH1C switchroom. An electrician investigating has found the smoke coming from No.3 Steel car resistor panel with the resistors running very hot and a lot of the PVC insulation on the cabling melting. A sequence of events lead to this damage: an operator left the steel car control station before the car has finished traveling assuming it will stop by itself, the controller became jammed in 1st step allowing the car to travel to the end stop and continue to attempt to drive south, and finally the south end travel infrared limit has failed due to the reflector being dirty. With all these events the south contactor has remained energised, the 415V 75kW motor continued to try drive south and the resisters have sustained approximately 100amps for a considerable time. All the PVC insulation had melted from the resister cables where they were not protected by heat resistant tape, which is believed to be asbestos tape.



The red hot glowing resisters when found.

Unprotected PVC insulation melted.



The melted PVC insulation dripping from each of the cable terminations.

The melted PVC insulation oozing from between the protective tape wraps

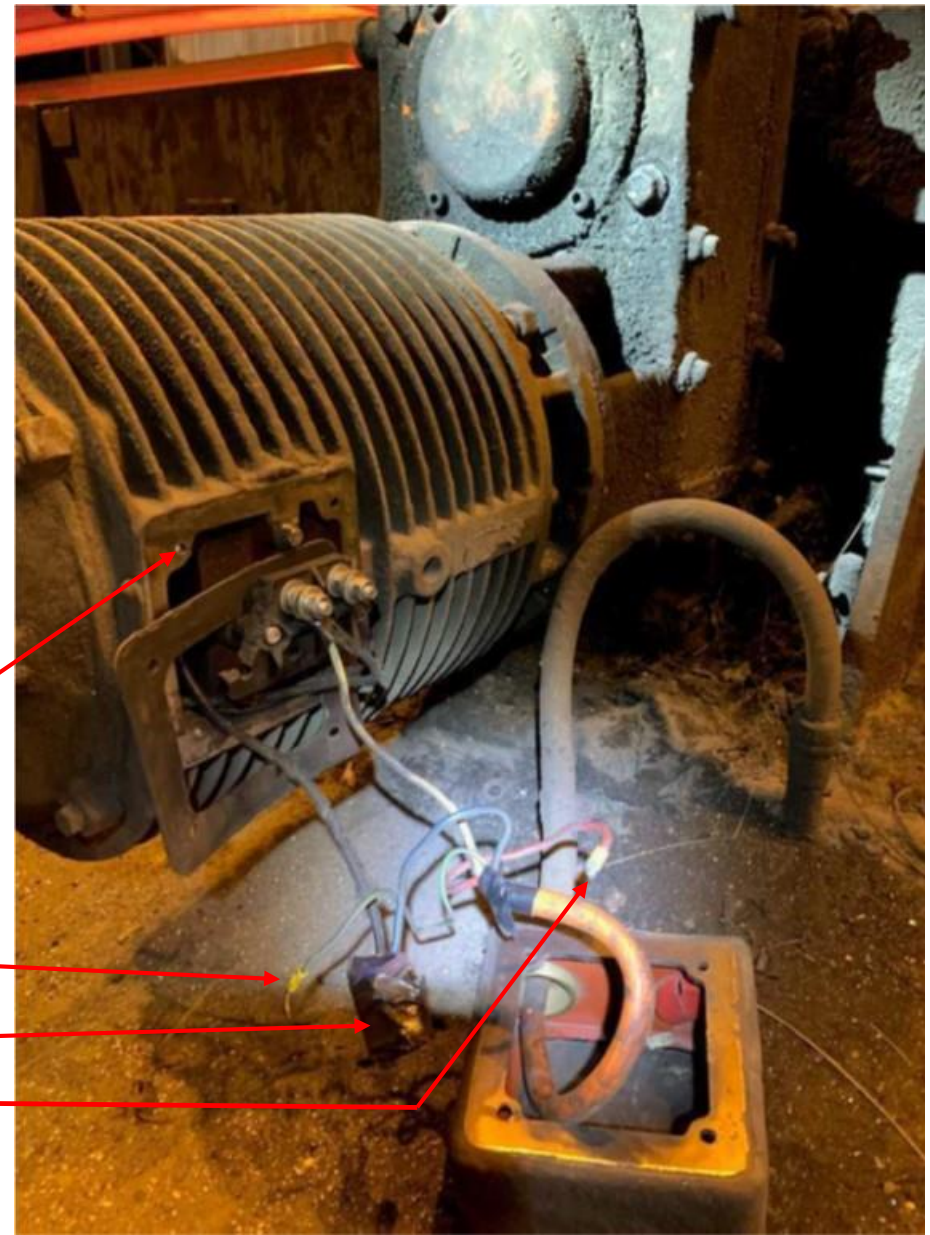
A close up view of a cable termination, clearly showing the effects of heat.

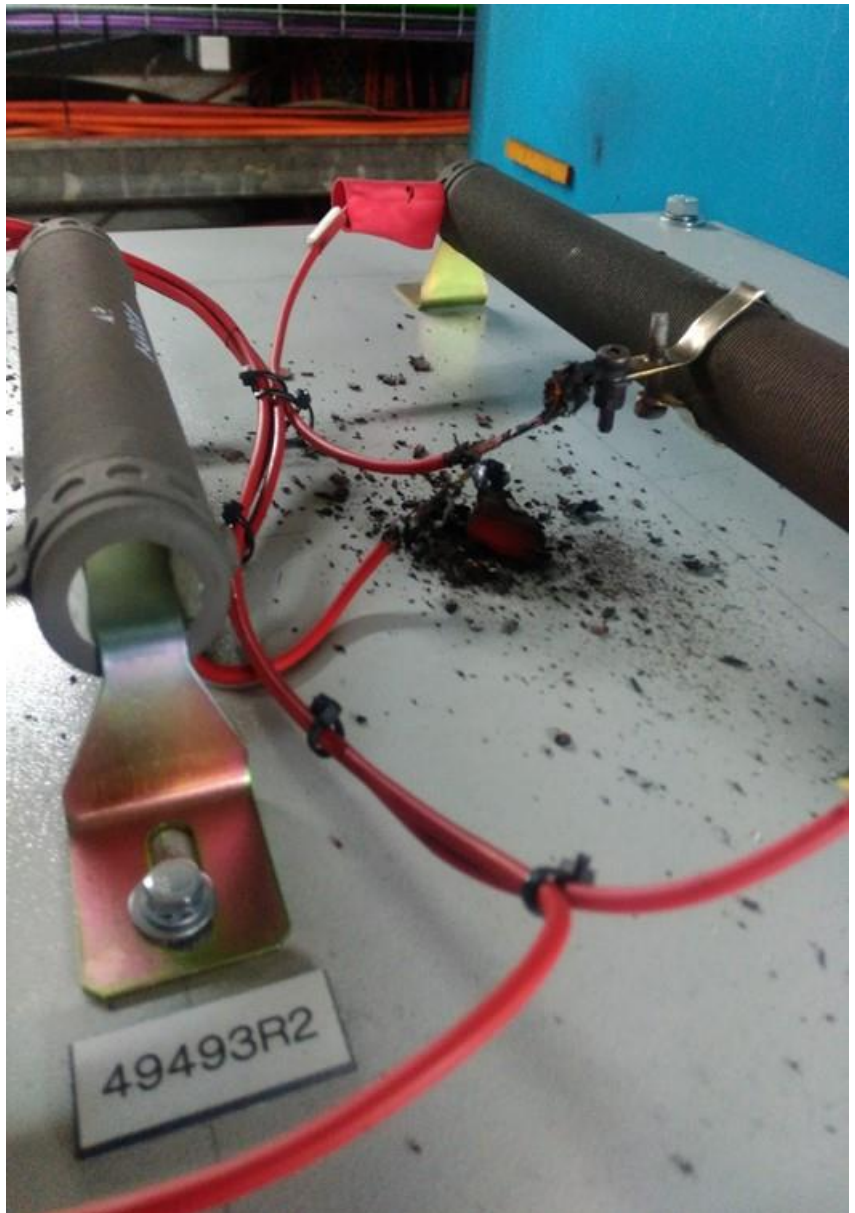
A shift electrician called to find out why a motor trip alarm was active has found a motor in a state of disrepair. The motor terminal box with the lid attached was found on the ground next to the motor and all terminals exposed. The internal holding screws of the terminal box had either worked their way loose and fallen off or become sheared off.
It must be noted that this motor is part of a table roll which traverses very hot 20 tonne slabs. The action of the slab over the roll causes a lot of vibration to the motor. The motor, terminal box screws and terminals are checked and maintained on a 12 weekly basis.

The table roll motor and terminal box when found.

Note the following damage

- Sheared off holding screw stud
- Protective earth wire detached from the earth stud
- Broken terminal block with blue phase
- Red phase lug broken from the terminal block





During fault finding why strip was slipping on a bridle roll it has be found the brakes were not lifting. Investigation found an open circuit in the brake resistor circuit due to a hot joint. A closer inspection of the connections to the resisters has found the connection lug was not crimped correctly when installed two and half years ago.
All terminations must be completed using the correct size lug for the conductor and the correct crimping tool. Check the crimping and torque settings of tools during construction and continuity of connections during commissioning.

What was found of the brake resister terminations on top of the drive panel.

Note the wire and lug have completely fallen from the termination point.