



# MONTHLY ELECTRICAL INCIDENTS

**ASP Manufacturing**

**July 2022**

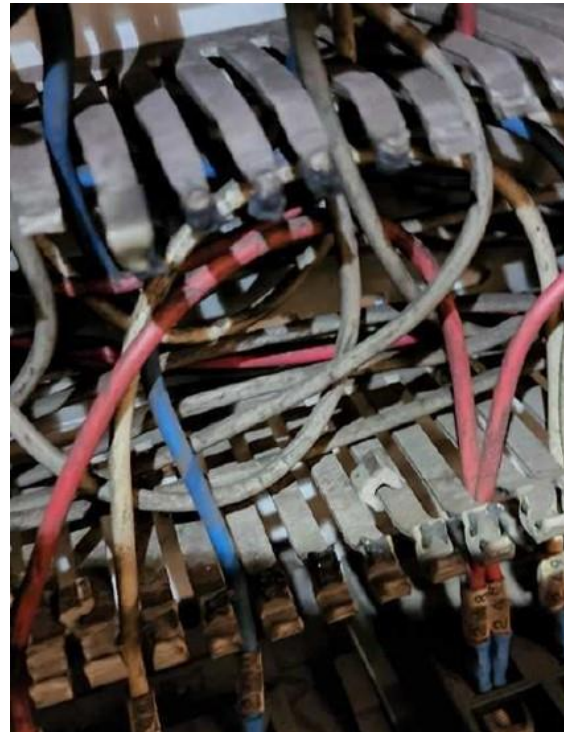


An electrician fault finding in a crane cross travel panel has inadvertently started a small fire on a contactor. Believing the contactor mechanical interlock to be jamming the electrician used CRC CO contact cleaner to free up the device. When the contactor was power tested a small fire propagated across the contactor and into wiring ductwork. Power was removed but the fire continued for about 10 seconds. The duct lid and sides were slightly burnt and melted but none of the wiring was effected. CRC CO cleaner can be flammable for up to 30 minutes after it has been used on any surface. Unknown to the electrician the usual contact cleaner can CRC NF which is not flammable looks identical to the CRC CO can.

This is a timely reminder to use the correct equipment and products for the job and ensure they are fit for purpose. Always read the MSDS sheet of any substance being used to understand the risks involved.



The cross travel contactors



The cabling below the contactor is all fine, but the sides of the duct has been burnt and melted

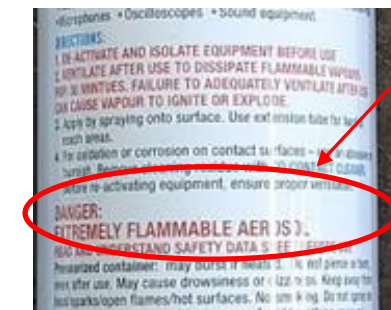


The burnt cable duct lid



The front and rear view of the contact cleaners used at the Western Port site

Note the CO can and the NF can look similar. The details at the rear of the CO can clearly states it is highly flammable. The NF can states it is not flammable



A 6amp 230V dc fuse was found blown while fault finding sub lance control. Without a correct replacement fuse available the shift electrician used a 16amp fuse which at first appeared to get the lance to move, however the lance moved by itself due the PLC 24V dc input card having 230V dc on it due to a cable fault that was not identified before the fuse was replaced. The cable route up to the lance was traced, burn marks were found on the cabling and another cable had melted. The lance emergency stop 2core TPS cable was found to be severed and was arcing. It had melted the insulation of the 24V dc control cable it was sitting on, resulting in transferring 230V dc to the 24V dc circuit. The immediate area is heavily covered in dust and Kish which had been deluged with water from the previous rains. Circuit faults must be carefully investigated before replacing fuses or resetting circuit breakers and protection. The correct protection settings and fuse sizes must be maintained to ensure circuits remain protected correctly.



The cable racking where the damaged cables were found.  
Note 1, the burn marks on the rack noticed

Note 2, the grey covering is a mixture of dust, Kish and water making a grey mud



The two severed ends of the emergency stop cable



The other damaged control cable with outer sheath and inner insulation melted exposing conductors. Covered in Kish mud.

An electrician was called when an outlet supplying power to a fixed CO gas monitor j-box have no volts. The outlet with integral RCD unit was fed from a 1amp terminal strip fuse which had blown. Contractors had attempted to use this outlet with a power drill, where as the outlet is only intended for use with the gas monitor battery charger.

Socket outlets intended for specific functions must be secured to prevent incorrect use and be labelled accordingly.



Inside the CO gas monitor j-box which was accessed by unauthorised people

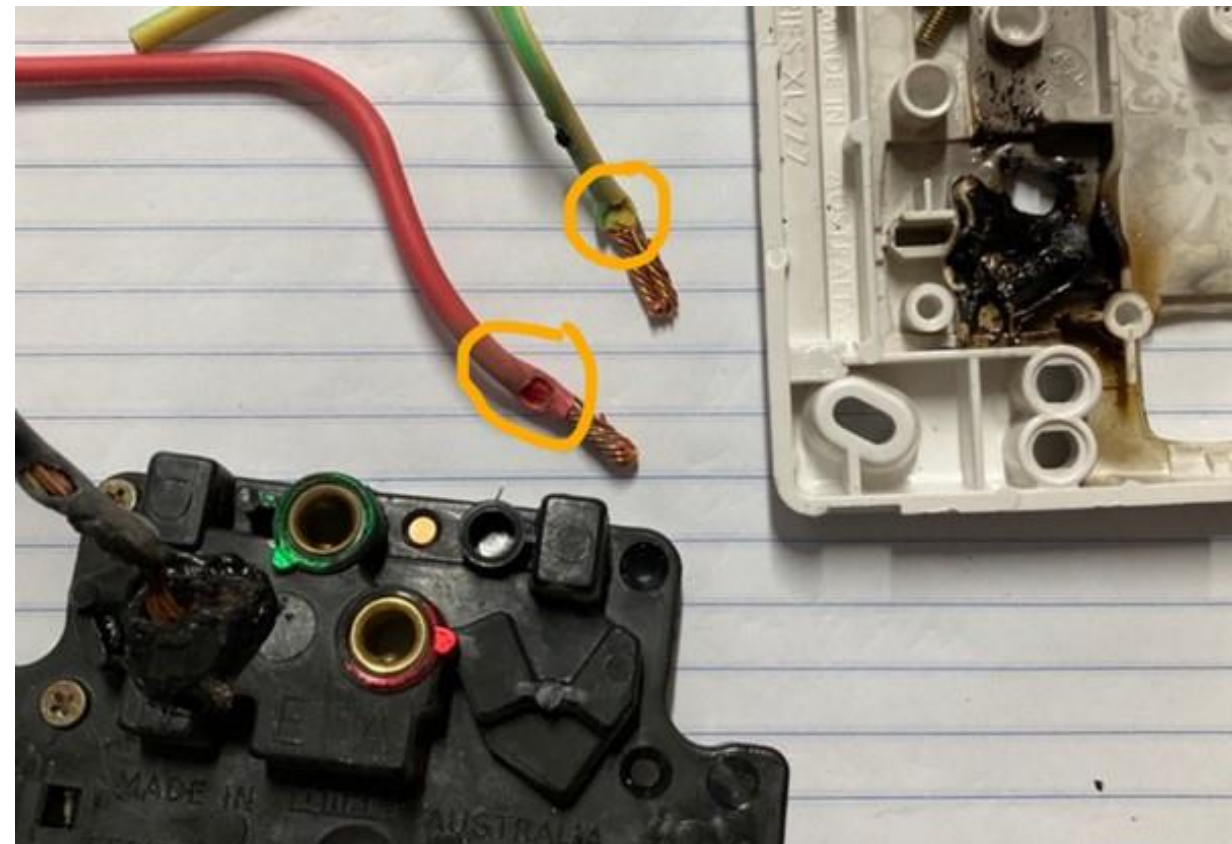
An operations staff member noticed loss of power within their work station and could smell burning plastic. An electrician has found the upstream 16 RCD had tripped. At the work station a 7-way power board was found heavily loaded, plugged into a short extension lead and when its plug was removed from a standard 10amp outlet it was found to have burn marks on both active and neutral pins. At the back of the outlet a hot joint on the neutral wire connection was found. Also the outlet was poorly wired with the terminating screw actually being secured to the insulation of the wires.

As per Electrical Safety Manual 1.4.14 power boards should have the appropriate construction, IP rating and overload protection for the environment where it is being used. Power boards should not be plugged into extension leads.



The plug of the board

The 7-way outlet board with the short extension lead, which does not have overload protection



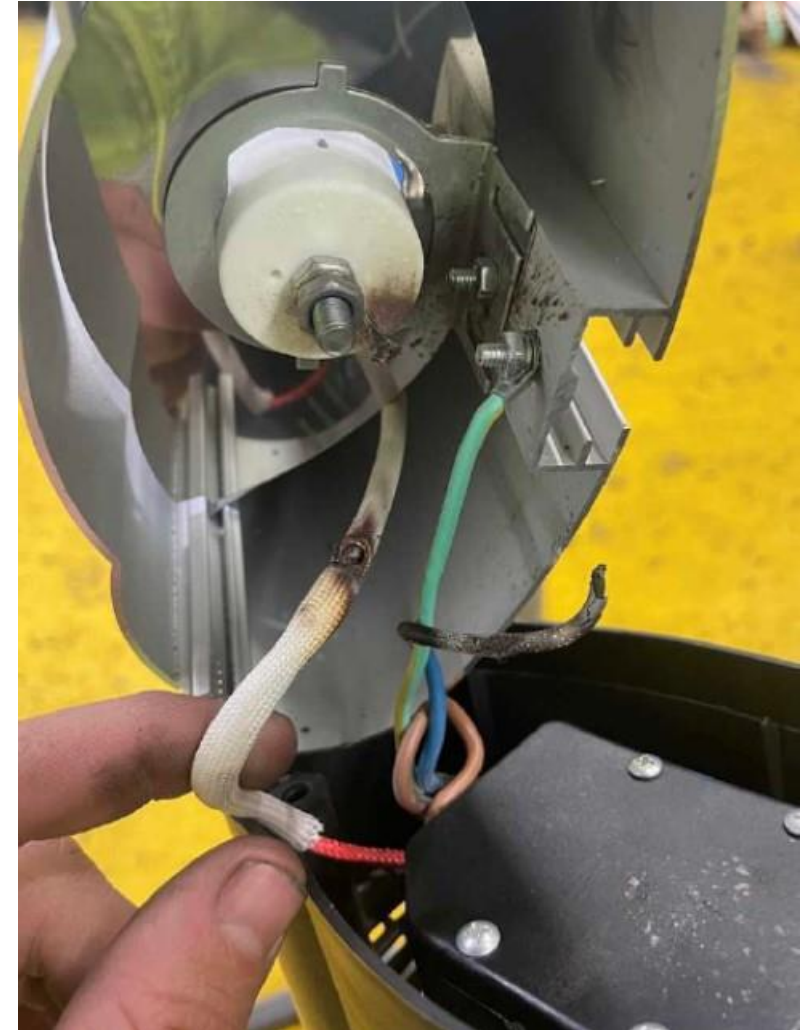
The back of the 10amp outlet with the melted connection of the neutral conductor from the hot joint. The terminating screw marks on the insulation of the wires

An operator complained when a portable heater made a loud bang and then had smoke coming out of it. An electrician found the RCD outlet the heater was plugged into did not trip but the upstream 16 amp fuse had blown. The heater internal wiring appeared to have a suffered hot joint on the neutral conductor, this had then burn through the heat protection sleeve of the active conductor and created a short circuit. Note the active conductor is a heat rated cable with an extra heat rated fibreglass sleeve over it, where as the neutral conductor had only PVC insulation.

Ensure all electrical equipment installed is rated for its environment as per manufacturers specifications.



The portable heater plugged into an RCD protected outlet



The internal damage of the heater. Note how the PVC rated neutral conductor has burnt through the fibreglass sleaving to create the short circuit.

A 32amp circuit breaker and 100A fuse supplying power to the cutting shed had tripped. Inspection of the supply cable found it had previously been repaired when a failure had blown a hole at a joint. The cable joint was not rated for an outdoor environment, only standard heat shrink had been applied over the cable connections which did not provide a water proof joint. Water has run inside the cable joint, compromised the insulation and created a short circuit between phase and earth.

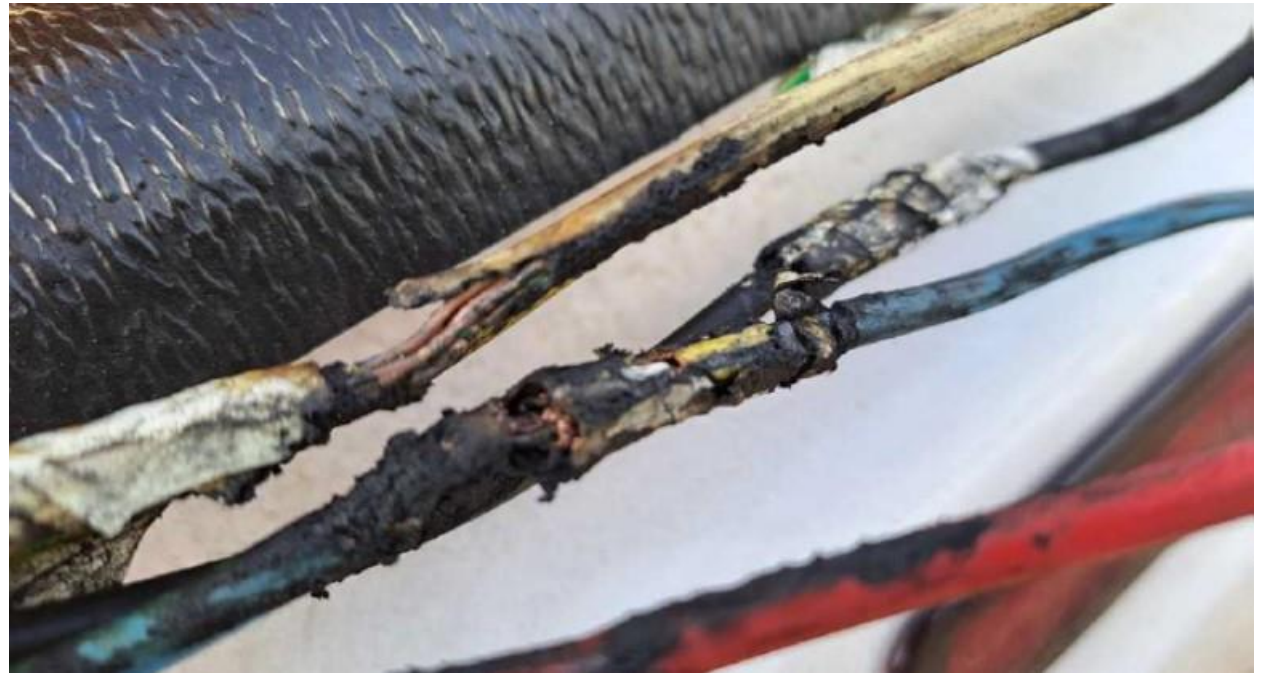
All equipment used in outdoor environments for the connection to electrical installations should be rated minimum IP42, be bottom entry and be mechanically protected to prevent moisture ingress. As per electrical Installation Manual section 4.3.7 for hostile environments and section 4.5.1 for field panels.



The blowout in the heat shrink cable joint



Evidence of arc marks on the side of the cable rack



The internal view of the cable joint.  
The blue phase has shorted to the earth conductor.  
Note only standard PVC tape has been used on each of the connections to insulate each phase from the earth