MONTHLY ELECTRICAL INCIDENTS

ASP Manufacturing

January 2022

Date: 29/12/2021
Location: No.1 Works
Reference: I2039666

Power control received an alarm for a trip on circuit 4-028 6.6kV with a system earth fault. After isolation of circuit an IR test confirmed red phase shorted to earth. An inspection of the cable inside a cable duct found an attempted copper theft by use of a hacksaw, which was found next to the cable damage. Entry to the cable duct from the adjacent road was made through forced entry.

All electrical supply equipment must be suitably secured to prevent accidental or inadvertent access, only authorised persons can access electrical supply equipment.
Refer BSL electrical safety manual 1.4.2.3. Report unsecured electrical equipment and unauthorised persons.

The scene inside the cable duct after the incident. Note the outer sheath of the XLPE cable has been cut back, the steel wired armour has been cut and pulled away from the cut site

The hacksaw cut site with the internal earthed screen and red phase conductor visible

The hacksaw found at the site

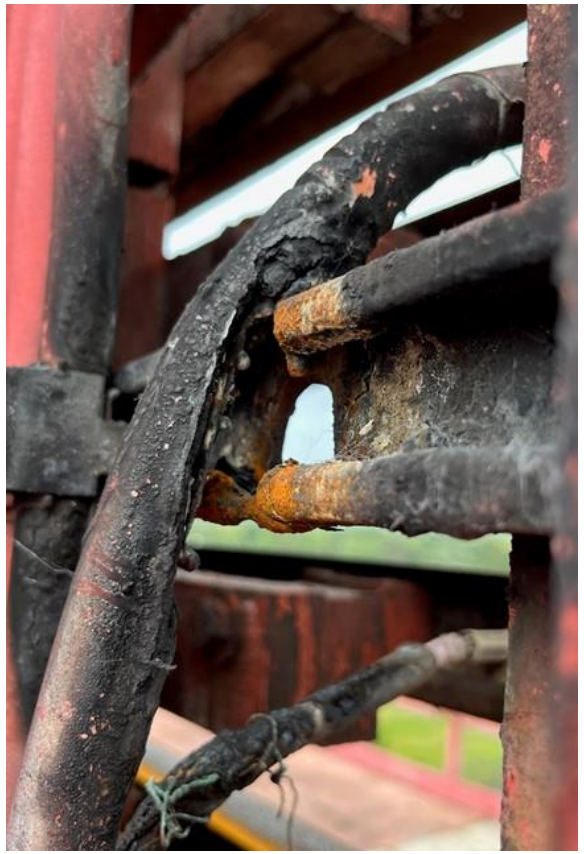
Date: 21/01/2022
Location: Plate Mill
Reference: I2047713

An SDI 95mm^2 cable was found welded Unistrut support rail during inspection of the cross travel live rail system. The cable's insulation has failed due to vibration and rubbing over a long time creating a short circuit to earth.The dc fault has created an arc which has burnt the cable insulation, and melted a section of the copper conductor but also allow the hoist motor to continue running, which has a FLC of 184amps. As it was the only earth fault on the 230V dc floating system no protection tripped.

Regular maintenance and inspections of electrical equipment and cabling is essential on moving machines to ensure the installation is not compromised by vibration or environmental conditions.

The DC armature cable going to the live rails behind. The cable has lost its Unistrut clamp allowing it to rub on the Unistrut rail

A side view of the cable and how the arcing has melted half the copper conductor and burnt a hole in the Unistrut rail



Date: 24/01/2022
Location: No.1 Works
Reference: I2048820

An audit of the earthing system of switchrooms A-21 and A-22 has found the earth piles to be in a bad state. One earth pile is in a pit filled with rust scale and has a busbar which runs into the switchroom connected to the pile with very poor connections. The other earth pile seems to be two driven rods in a pit, with one rod completely disconnected and the other rod only partially connected to the busbar which runs into the switchroom.

As per AS3000 section 5.1.2 an earthing arrangement shall be installed to enable the automatic disconnection of the supply in the event of a short circuit to earth. To ensure the integrity of our earthing systems there must be regular inspections of the earthing system parts from earth piles right through the protective earth connection on an electrical device.

The first pit with the rust scale.
The copper busbar coming down onto the pit is connected by 4 rusted bolts at the bottom of the pit.
With the scale clean away the bolts are just visible

The second pit with the 2 driven rods.
One rod is completely disconnected and the other rod seems to be partially connected to the copper busbar

Date: 18/01/2022
Location: HSM
Reference: I2045764

An electrician trying to find why a power outlet circuit RCD would not reset has found an outlet with water ingress. The circuit was meggered to be 0.7 M ohms. Each outlet on this circuit was inspected eventually an outlet was found to be contaminated with termite debris and water ingress.

A view of the back of the outlet with the termite debris becoming like mud across the terminals

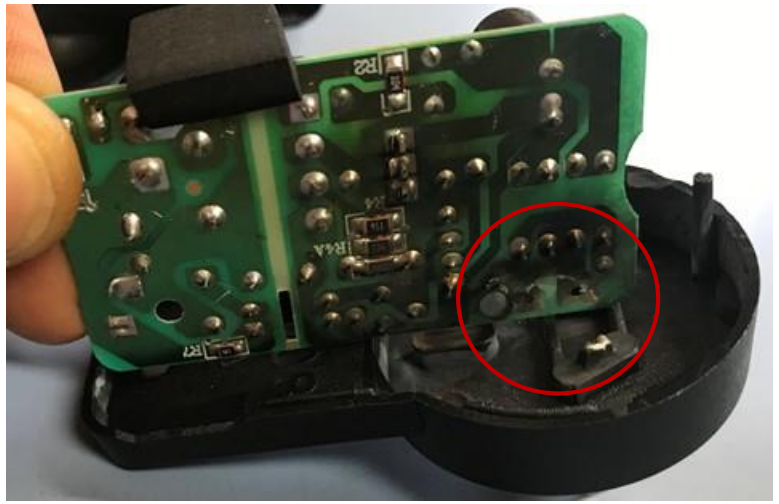
Date: 14/01/2022
Location: Unit Block in Sydney
Reference: None

An interesting event to share about being aware of the risks of electricity.

In a unit block in Sydney there is a common system which operates the building network system including phone/internet/TV. Each unit has a network switch that talks to the common system and is plugged into a standard outlet which is housed in a cupboard out of the way. A unit owner investigating why there was no power on the TV unit has noticed one of the breakers in the distribution board had tripped. In attempting to reset the breaker all power to the unit has been lost with the 63amp supply breaker for the unit tripping. Once all devices in the unit were unplugged and/or turned off power was restored to the unit. After a long search the forgotten network switch in the cupboard was found to be the issue. The standard outlet mounted 12V dc power supply for the network switch had blown itself off the wall, leaving the base still plugged into outlet. Major issue was with power now restored the pins of the base were energised with 240V ac and exposed. This is a trap for any inexperienced person and a possible risk of an electric shock if contact was made with these exposed terminals.

Damaged electrical equipment and circuit breaker trips need to be thoroughly investigated to ensure the installation is safe. Always get a licensed electrician to check and investigate if you have an electrical issue.

How the unit owner found the power supply.
Note the burn mark above the right hand plug in the outlet, the unit on the shelf and the splatter marks on the white shelf
The power supply on the left was unaffected.



How the power supply was mounted inside the unit.
Note the burn mark on the bottom of the card where the 240V ac cables would have been, these cables were completely disintegrated.

The casing of the 12V dc power supply.
* Base plate with 240V pins which were unaffected.
* The reverse view of the base plate showing the two exposed pins which were energised with 240V ac when found.
* The housing over the power supply showing the flash burn marks