MONTHLY ELECTRICAL INCIDENTS

ASP Manufacturing

August 2022

Date: 8/08/2022
Location: Electrical Shop
Reference: I2150515

Roofing contractors lost control of a wire mesh coil while replacing Alsynite sheeting on a roof above energised 415 Vac live rail conductors. The coil unrolled as it fell through the roof opening and then contacted the live rails causing the 315 A supply fuses to blow before finally landing on the ground below. The fault left burn marks on the live rail conductors and parts of the roof the mesh had been in contact with.

All work near live rails must be assessed for adequate clearance and risks of encroaching the live conductor exclusion zone. Controls must ensure the exclusion zone will not be infringed or rails must be isolated. Isolation provides the most effective hazard control.

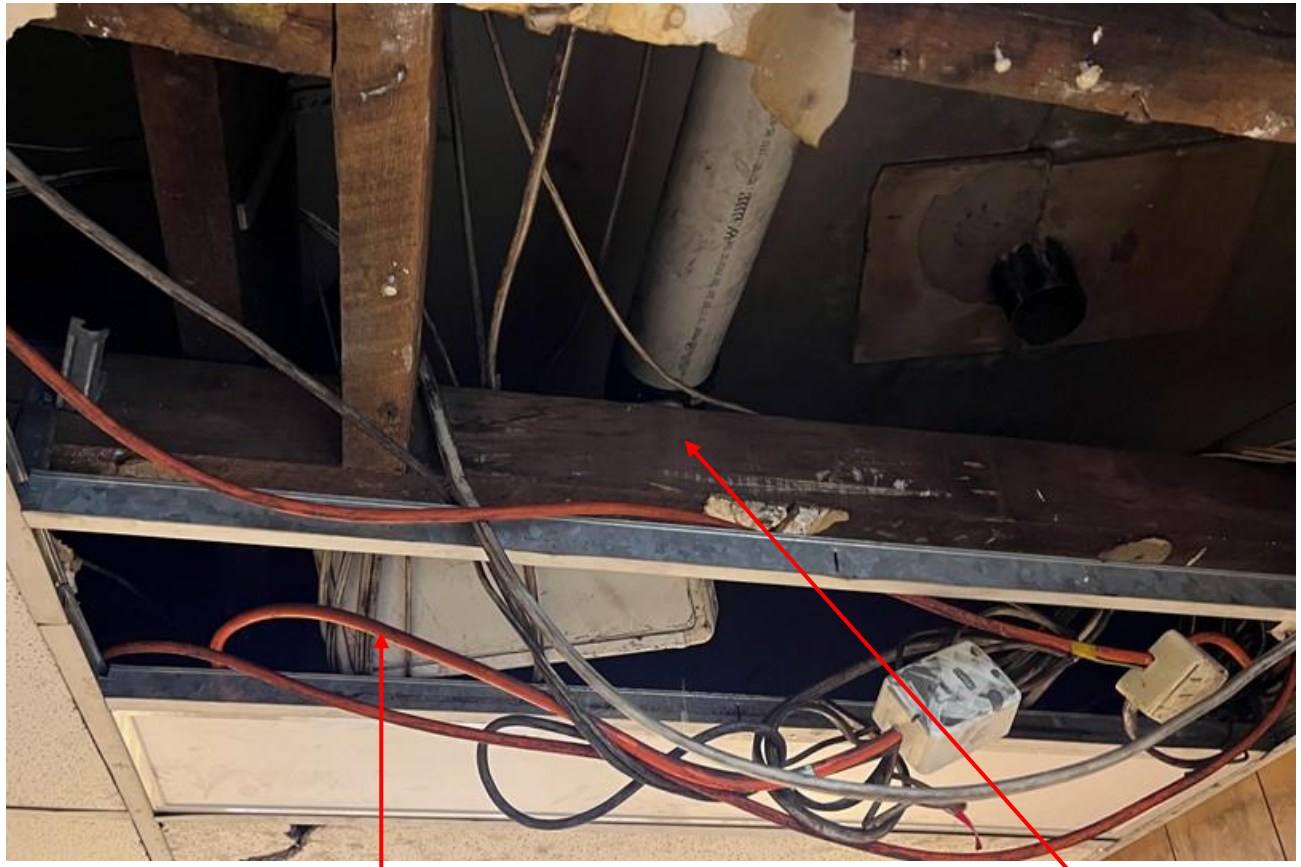
The opening in the roof for the installation of Alsynite sheeting. The wire mesh has fallen through this opening onto the live rails below

The 415V ac live rails with burn marks from the arc flash

Date: 16/08/2022
Location: Sinter Plant
Reference: I2154129

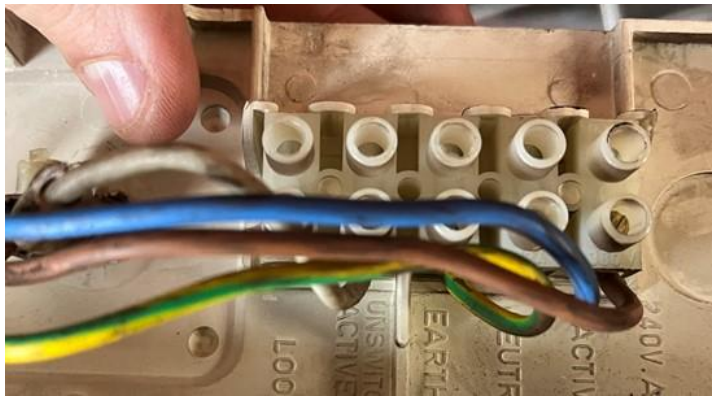
An apprentice plumber received an Electric shock while repairing a leaking pipe in an office ceiling. The leak was located above electrical cabling and a redundant emergency light fitting which had been left in the ceiling space. Power to other working light fittings had not been isolated before commencing work. Tests could not identify live voltages on cables in the area despite some being wet, however the emergency light fitting was found to still have 240 Vac on its terminals despite being redundant. Water has potentially resulted in leakage current from the terminals to the metal frame which the apprentice may have contacted.

It is essential electrical equipment is isolated before commencing work in areas at risk of contact with live parts. Water increases the risk of contact with electricity, hazards must be identified in job planning and risk review. Redundant electrical equipment must be made safe by removing all sources of supply. Redundant cables and equipment should be removed wherever possible.



The emergency light fitting with supply cable wrapped around it

.The leaking water pipe following repair



Energised 240V ac terminals inside the redundant emergency light fitting

The redundant emergency light fitting as found

Date: 10/08/2022
Location: Coke Plant 1
Reference: I2151633

Two civil workers reported receiving an Electric shock while conducting concrete roof repairs in a switchroom. One worker was operating a battery powered grinder while standing on a metal ladder, while the other was standing on an insulated mat on the floor and using a 240V vacuum cleaner with a PVC pipe extension attached to the flexible hose to prevent dust contaminating the switchroom and electrical equipment. When the worker standing on the ladder came into contact with the PVC pipe, both workers felt a shock.

All electrical equipment in the vicinity was inspected and tested for voltage, no defects were identified. The shock is believed to be due to static charge generated by dry concrete dust passing though the PVC pipe extension to the vacuum hose, which suddenly discharged after contact with the worker standing on the uninsulated ladder.

Accumulation of static charge due to the velocity of concrete dust particles through vacuum hoses is a known hazard. Antistatic conductive or dissipative hoses fittings are available to prevent charge accumulation and should be used in applications where this risk exists. Additional caution is required when cleaning dusts with explosion risk such as coal. Expert guidance should be sought for these applications.

The vacuum cleaner with PVC pipe attached to the flexible hose. This was used to prevent concrete dust contaminating the switchroom. Note the operator was standing on an insulated mat and wearing cut resistant gloves.

The area where the grinder was chasing out the concrete

Date: 23/08/2022
Location: Hot Roughing Mill Furnace
Reference: I2157324

A boilermaker has felt an Electric shock to the left hand while welding a lift cylinder after being splashed with water. The work area was initially dry and clean for welding, however a seal trough located above the work area overflowed resulting in the work area and boilermaker being splashed. The boilermaker continued welding and received an electric shock due to water increasing the effective contact area and lowering body impedance.

The presence of water significantly increases electric welding risks. AS1674.2 and the Welding Safety Manual MA-ENG-105 define 3 welding environment categories, category C posing the highest risk of electric shock due to water or moisture ingress. Below is an extract from that manual.

Category C environment

An environment where the risk of an electric shock or electrocution by arc welding is greatly *increased due to low body impedance of the welder* **and** there is a s*ignificant risk of the welder contacting the work piece or other parts of the welding circuit.*

Low body impedance is likely in the presence of :

- Water
- Moisture
- high humidity, promoting perspiration which reduces the skin resistance of the human body and the insulating properties of personal protective equipment
- or heat, i.e. ambient temperature is above 32°C

Controls

These controls are applicable to both welders and their assistants

- Where it is determined that the welder or welding equipment can become wet from rain, splashing, partial submersion or other external sources, then adequate control measures shall be implemented before welding commences.
- The use of covers or a roof to protect a welder from water exposure (e.g., rain or a dripping roof)
- Every effort shall be made to make the environment as cool as possible to minimize perspiration
- Frequent changes of clothing, if required (particularly cotton glove liners) will also reduce the risk of electric shock.
- At no time does BSL condone the execution of welding related processes in wet conditions. At all times welding operators are to be protected from wet or damp conditions

The

Date: 1/08/2022
Location: Western Port
Reference: I2147781

Cold Reduction personnel noticed a glow and flashes in the 33kV outdoor switchyard and contacted the High Voltage supervisor. The supervisor identified a bolt on a CT connection was glowing hot and molten aluminium was evident on the ground below. The FSM stopped rolling to reduce load and the site electrical engineer was informed of the problem. A switching instruction was prepared to complete investigations and repair. A thermal image scan found the joint to be at 212 degrees Celsius. The maintenance strategy is being reviewed.

A close up of the aluminium CT connection with melting damage due to the hot joint evident

The incoming aerial supply CT connections at night when the hot joint occurred

The thermal image scan clearly showing the hot joint

The aluminium connector after the event, showing a fault line which could be the cause of the hot joint

Date: 19/08/2022
Location: HCPD
Reference: I2155916

The isolation padlocking mechanism of the main ACB may not adequately secure the breaker in the isolated state depending on the type of multi-lock hasp used. The locking mechanism engages the breaker open button. Wear of the locking mechanism prevented a plastic multi-lock device from engaging the operator sufficiently to maintain disconnection and allowed the breaker to be closed with the remote close push button. The locking arrangement is not suitable for isolation purposes and will be replaced.

The locking mechanism at the front of the ACB. The lower flap closes onto the top section with the raised section depressing the open pushbutton

The ACB in the locked out position secured with a red plastic multi-lock device. The multi-lock does not engage the locking mechanism sufficiently to inhibit breaker close operation.

A metal jaw style multi-lock device presses the locking mechanism closer together ensuring the open pushbutton is sufficiently depressed to inhibit ACB operation

Date: 11/08/2022
Location: Western Port
Reference: I2152499

A 6.6kV underground cable tie between the HSM CR-6.6-107 and OFD CL-6.6-104 failed at a cable joint in a section buried approximately 1000mm below the surface. The location was easily identified with a large hole created on a lawn. The direct buried cable had a 100mm concrete cover. The fault explosion impacted the surface despite this.

The site of the cable damage and the hole in the grass

The remnants of the cable join after it was dug up.

The excavation site of the new cable joins