



BlueScope

Electrical Incidents

Key Learnings

ASP Manufacturing

2024 / 1



Reference: i2430165 – Plumber drills through hidden cable

Internal cabling was damaged as a plumber drilled a hole into a recently installed demountable office building to install waste-water outlet piping. The JSEA included checks to confirm electrical supply had not been commissioned, with instruction to isolate otherwise. Electricians working under a separate SSW had supply to the construction village isolated and locked out. The plumber confirmed the supply was yet to be commissioned and worked without locking out.

The plumber had performed the same task on five previous installations, taking care to drill slowly and methodically. He was almost through the very last hole and stopped when he saw orange swarf. The mostly cut material was folded back, revealing the damaged cable. The rest of the hole was completed using tin snips.

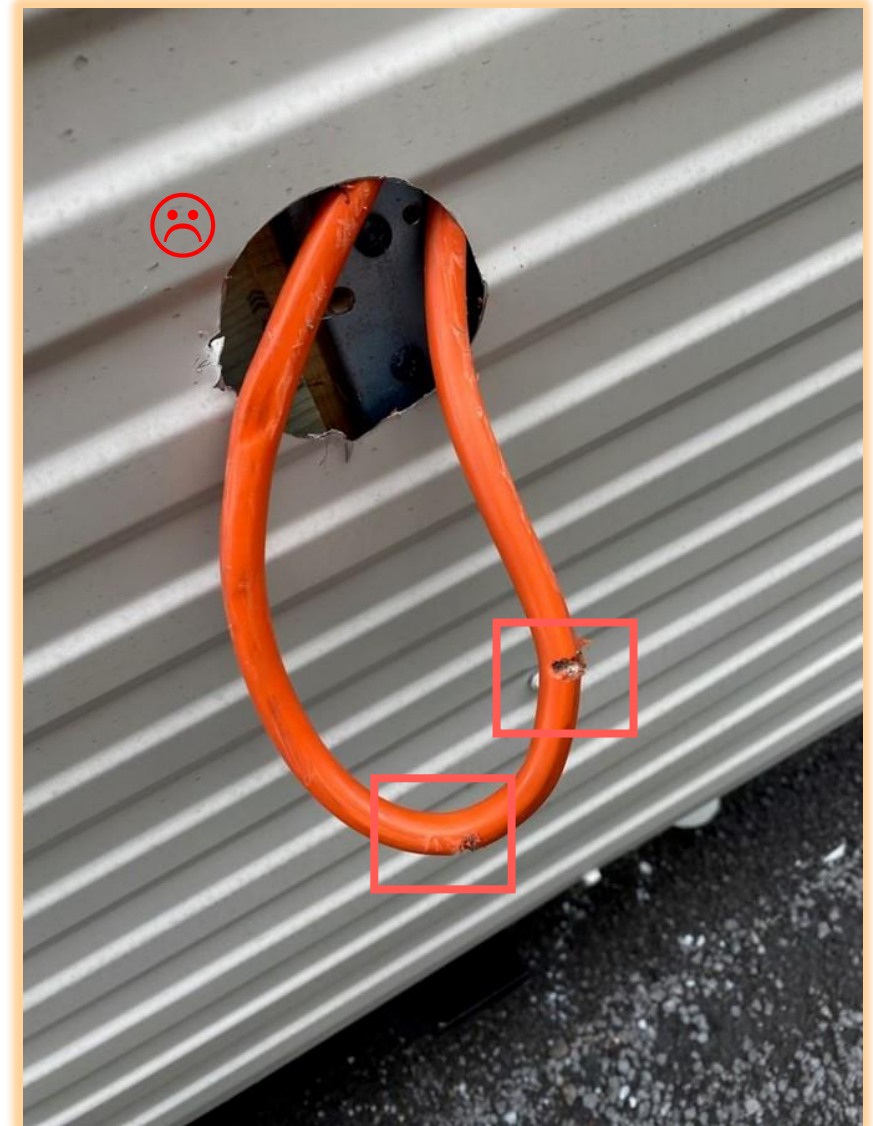
There is a risk new installations may become live once supply cables are installed. The state of power supplies to new installations must be carefully managed in conjunction with work planning as part of the SSW process.

Electrical hazards must be considered when planning work, even non-electrical tasks. Work involving live electrical risks may only be performed following isolation and locking.

The Excavation and Penetration Procedure - DIV-ES-ADM-033 should be followed where there is a risk of contact or damage to embedded or hidden services. The location of services should be determined and marked prior to commencing penetration work. Work methods may need to be altered where the location of services cannot be positively determined.



Cable damaged by hole saw



Hole drilled into steel cladding

An isolation procedure was written for replacing a power track cable. The cable termination panel could not be accessed during normal operation due to the location and guarding. The procedure was created by identifying all the cable numbers from the power track, then determining sources of supply via drawings.

After isolation, the installation of scaffolding, and removal of guarding, the panel was accessed and a Test Before You Touch procedure was followed. This process detected 18 energised wires, all at 240 Vac.

A closer inspection of the termination panel found another power track cable, from a location 3 levels up was also terminated at the panel via other conduits & ducting. The source of the 240 Vac was confirmed, and an extra isolation point added to the procedure.

The issue - Limited access to equipment prevented pre-inspection to identify all sources of supply.

Key Learning – Isolation procedures require careful verification, particularly when being used for the first time. Procedures should be prepared in advance and adequate time allowed to identify and verify all sources of supply. Schedule outages to verify procedures ahead of use where possible.

Drawings and equipment labels must provide adequate information to identify sources of supply.

It is essential that changes are managed, and drawings maintained to accurately reflect the installation in service.



Example of Test Before You Touch being completed before working on an electrical panel.

Reference: i2419759 – Switch Room Access and Emergency Exit

Whilst performing isolations, an electrician found access to switch room doors was impeded by the storage of spares and trash.

Poor management of spares and housekeeping failed to maintain clear access to doors and blocked several walkways used for emergency egress.

Compliance to AS/NZS 3000:2018, includes clause 2.10.2.2.2 for Switchboard Rooms – which requires doors to open in the direction of egress, have an unobstructed height of 2.0 m and an unobstructed width of not less than 0.9 m. The pathway should be clear for the whole route of the emergency egress.

Prominent signage and floor markings help remind people to keep clear of switch room doors. Housekeeping audits should identify similar issues.



Switch room doors blocked by spares & trash – restricting access and emergency egress.



Light moved for scaffolding

Light fittings were damaged during the erection of scaffolding and work to replace a roof.

An external building light had been removed to allow for scaffolding and it appears the electrical supply was not isolated before removal.

Two internal roof lights were also found damaged, one falling after melting.

There was no electrical sign-off when the scaffold was built, and the hot work controls for the job did not prevent damage to the roof lights.

Electrical Hazards must be considered and correctly controlled when erecting scaffolding – Refer to Electrical Hazards Associated with Scaffolding DS.DIV-OHS-01-04.05.04

Hot Work Permits should include controls to prevent damage to electrical equipment, conduits, and cabling in the area.

Refer to - Hot Work Procedure DIV-OHS-06-219, and Hot Work Checklist F.DIV-OHS-06-219-01.



Damaged roof light

Reference: i2419602 – Crane Electrical Panel Door falls to ground

A jib crane electrical panel door fell approximately 5 meters to the ground. It appears the panel door was not closed and had contacted the crane structure during normal operation, tearing it off at the hinges.

The door latches had either opened with vibration, or they were not secured properly after maintenance.

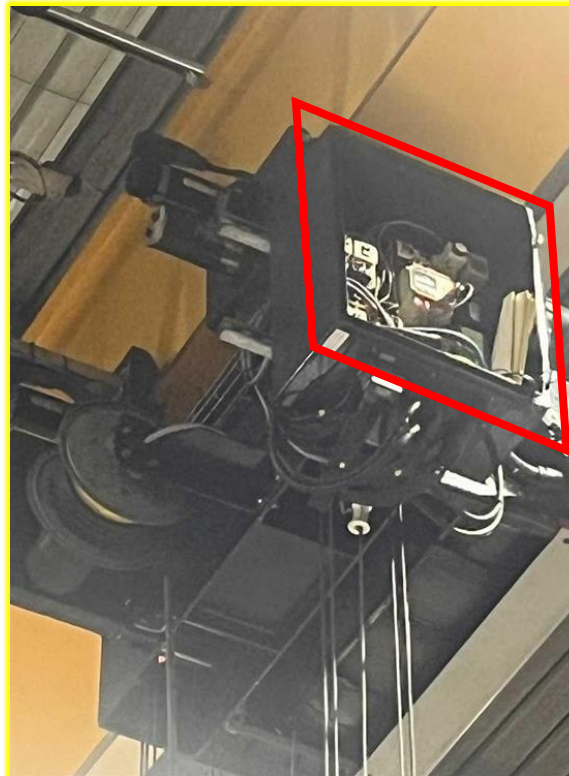
We need to consider the integrity of electrical panel door locking mechanisms on mobile equipment, especially where there are small clearances to structures.

Installation of vibration proof latches can prevent accidental opening.

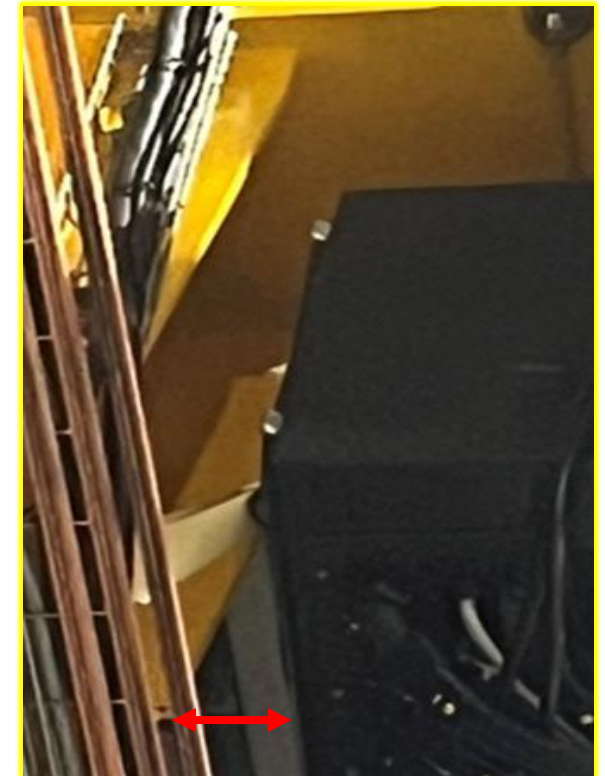
Maintenance procedures with door security included in the final checks will remind us too.



Panel Door on floor



Panel (minus the door) on the crane



Tight clearances

A large spare capacitor was found in a storage bin with the terminals exposed and not shorted together. This is an unsafe condition.

From BSL Electrical Safety Manual Part 1 MA.DIV-ENG-ET-004-01, Rev3, Sect 1.4.7.4 -

Hazard: Capacitors are stored energy devices and therefore shall always be regarded as live equipment. Consequently, charged capacitors can deliver an electric shock even when the power supply is isolated. Short circuiting or grounding of capacitor terminals with metal objects such as spanners or screwdrivers can result in arc blast and flash burn injuries.

Before carrying out work on circuits involving capacitors always ensure the capacitors have discharged.

If a discharge path is not part of the permanent circuit and a portable discharge resistor is used, this resistor shall have insulated leads connected to insulated hand probes rated greater than the capacitors peak working voltage. Do not apply a short circuit to discharge a capacitor.

Power capacitors that are not in use should be individually short-circuited with a robust connection after discharging. Refer to manufacturer handling and storage recommendations and seek advice where you are unclear.



Capacitor with terminals shorted for storage