

Hazard Fact Sheet - Substations & Battery Energy Storage Systems (BESS)

What is the Hazard?
Substations and Battery Energy Storage Systems (BESS) contain high-voltage electrical equipment used to convert, manage, and store power. These areas can become live during construction and commissioning. Entry is restricted and requires permits and authorisation.

Types of Injuries / Health Effects

- Electric shock or electrocution
- Arc flash burns
- Fire & explosion injuries
- Toxic smoke inhalation in the event of battery thermal runaway or fire

Causes / Scenarios

- Entering commissioning zones without a permit
- Working near energised cables, transformers, inverters, or switchgear
- Tools, scaffolding, or EWP booms contacting live equipment
- BESS battery faults / thermal runaway
- Poor communication between construction and commissioning crews
- Lack of awareness of substation boundaries

Control Measures

- Only enter substations or commissioning zones if you have proper authorisation and a permit.
- Always look for and respect warning signs, barricades, flags, and lockout points around high-voltage areas.
- If you are unsure about any area or task, stop immediately and ask your supervisor for guidance.
- Maintain safe distances from electrical equipment and never cross into exclusion zones without permission.
- Check pre-start briefs daily to know which zones are energised and what precautions to follow.
- Only work on or near energized equipment when instructed by a Permit Holder or Commissioning Supervisor.
- Never use water on electrical fires; only trained personnel should use Class C or CO_2 extinguishers.
- Report any damaged, malfunctioning, or unsafe equipment or barriers to your supervisor immediately.
- Stay alert and avoid distractions when near substations and always follow site safety rules without exception.

https://www.worksafe.qld.gov.au/safety-and-prevention/hazards/electricity/electrical-work-on-or-near-energised-electrical-equipment



Safe Work Australia – Working Near Live Electrical Installations



Case Example:

Inverter Fire Near Substation Area
An inverter that feeds power toward substation/BESS infrastructure caught fire at solar construction site. Crews isolated power and used foam to extinguish the blaze. The incident highlights how faults in high-energy electrical equipment can escalate quickly.

Key Lessons Learned:

- Stay out of restricted electrical areas unless trained and authorised.
- Report any signs of damage (burning smell, smoke, strange noises) immediately.
- If a fire starts, don't try to fix it yourself, unless trained. Move to safety and alert supervisors.