Short circuit on 440V AC bus bars – arc flash

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A crewman was doing electrical work on a 440V power distribution panel (PDP), when a loose earth bonding cable made contact with a live 440V bus bar causing a short circuit and an arc flash

IOGP Life Saving Rules:

- Bypassing safety controls
- Energy isolation

What happened?

Whilst the crewman was using cable ties to fix loose cables within the panel, he observed a loose earth bonding cable in poor condition.

He made up a new earth cable from 6mm wire, and whilst he was attempting to re-connect the earth bonding cable, the loose trailing end of the earth bonding cable came into contact with the 440Vac bus bar.

A short circuit between the 440Vac and the earth bonding cable was observed resulting in an arc flash.

At the time there were no injuries nor damage to equipment. The crewman reported the incident to his line manager, reporting that he felt shaken by the incident and felt his heart racing. He was sent to his cabin to rest.

Subsequent to the incident, the crewman reported experiencing blistering on his

hands and attended a walk-in medical centre where he was diagnosed with partial thickness burns to his face. He was assigned light duties for two weeks.

What went wrong?

- Crew deliberately ignored safety protocols to expedite what was considered an easy and straightforward task:
  - One job was started (supervising the installation of a welding cable) but then changed to another job. The injured person did not discuss this work with his supervisor, nor carry out a risk assessment, TBT or raise a PTW for the work.
  - There had been a generic toolbox talk (TBT) completed but work on the PDP was not mentioned.
- This incident was not reported in a correct or timely way, denying the injured person access to immediate medical attention which may have mitigated his injuries.

What lessons were learned?

- There was inadequate supervision with regards to compliance with electrical safety control measures.
- The risk of unauthorised access to the power distribution panel (PDP) had not been properly assessed.
- The panel had inadequate insulation of terminals which remained live when panel was opened, this may have been broken off or removed over time.

What actions were taken?

- Access to electrical cabinets should be restricted.
- Electrical safety audit conducted on-board vessel.
- Risk assessment to be re-written to include mitigations to identified hazards.
- Further incident reporting and investigation training to be delivered to vessel crew.