

# SAFETY ALERT



## ELECTRIC SHOCK FROM DAMAGED FIXED WIRING

### INCIDENT

A contract electrician received an electric shock while handling a fixed cable.

### CIRCUMSTANCES

The electrician was tracing the route of some fixed cabling that was to be removed. Using a non-contact voltage detector he found that the cable was live, but wriggled it to find its path in a cable tray. The cable was three phase 415V PVC/PVC, without screen or armour.

### INVESTIGATION

The electric shock occurred where the cable entered a non-metal enclosure. The outer sheathing had pulled out of the metal gland, exposing the insulated inner cores. There was a small cut in the inner insulation, presumably made when the original sheath had been pared away. The outer cable surface became live due to the damaged area being exposed to moisture and solid particles. The metal gland and other metal fittings on the enclosure were not connected to earth. The cable was subsequently meggered at 0.2 megohms.

### RECOMMENDATION(S)

Electric shock can be prevented by earthing all exposed metal parts of electrical apparatus, and providing a disconnecting device capable of tripping off if there is an earth fault.

If metal parts are not earthed, the disconnect device cannot work, and the fault will sit there until a person comes in contact with it.

Conventional electrical maintenance practices are designed to confirm the integrity of these simple safeguards, by:

- Routinely testing the earthing of apparatus (Continuity testing),
- Routinely testing insulation integrity to earth (Insulation testing),
- Routinely inspecting, testing or injection testing the disconnecting device (Trip testing).

The person responsible for electrical engineering safety at each site must ensure that these tests are included in their maintenance regime at the frequency appropriate to the site. The tests must be carried out by trained, competent, maintenance personnel in a rigorous and diligent manner.

Recording of tests should also readily identify non-completion of tests, and specify actions to be taken. The results of the tests should be compared against set acceptance criteria and should be recorded in such a way that it is clear where tests have not been carried out at set intervals.

### APPROVED

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