

Practical Advice for the Avoidance of Microshocks



Practical guidance for construction sites

The electric shocks, or microshock's, sometimes experienced by staff working on construction sites near power lines are caused by voltages being induced into metallic objects by the adjacent live conductors.

The perception of a microshock depends on the size of the electric field and object, as it is this that determines the extent of charging of the objects concerned.

In general, microshocks will be greatest if a long object (e.g. steel girder or scaffold pole) is held in parallel with the overhead line conductors. These voltages need to be dissipated to earth by making an electrical connection between the object(s) and a common earthed point.

Practical examples

A typical situation is when a steel framed building or a large scaffolding is being erected. Due to the physical size of such a structure and the way it contacts the ground, it can usually be considered to be sufficiently earthed for the purpose of dissipating induced voltages. All that is required is to make a temporary connection from this existing structure to any further poles or steelwork being lifted into place. Once connected to the main scaffold or building structure, the connection may be removed.

A similar electrical connection should be made to any other vehicles or plant that may be affected by the induced voltages – cranes for example.

The connections themselves can be made with flexible cables - the size is not critical as long as they are robust enough to withstand regular handling on site. The "ground" ends can be bolted to a suitable point on the fixed structure, the "free" ends can be bolted or spring clamps can be used.

In the absence of any other suitable earthing points, an earth spike may be used and the cables attached to this. The spike should penetrate the ground approximately 0.5 metres and the ground should have some moisture content to be effective at dissipating electrical charge.

It is also recommended that you avoid carrying out refuelling operations in the vicinity of a power line, to any vehicle or plant that is not effectively earthed as a spark could occur particularly if a metallic container is being used.

These precautions are similar to those taken by National Grid's own staff to solve the same problem and will work provided that effective connections are made and a methodical approach adopted.

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