

Low voltage live working by a single worker

Legal provisions

Live working installation works

Live working accident

Europe 



Germany 

Directives under article 137 (minimum requirements)

Council directive 89/391/EEC

Measures to encourage improvements
in the safety and health of workers at work



ArbSchG

Safety and Health at
Work Act

Member states are not allowed to fall below the **minimum requirements** in their national legislation

Council Directive 89/391 EEC, article 6



General obligations on employers

The employer shall implement measures to ensure the safety and health of workers on the basis of the following **general principles of prevention**:

- combatting the risks at source,
- adapting to technical progress,
- giving collective protective measures priority over individual protective measures.

Council Directive 89/391 EEC, article 8



First aid, fire-fighting, evacuation ...

1. The employer shall take the **necessary measures** for **first aid**, adapted to the nature of the activities ... and taking into account other persons present
2. For **first aid**, fire-fighting and the evacuation of workers the employer shall **designate** the **workers** required to implement such measures

Accident Prevention Regulation “Principles of Prevention” § 25 (1)



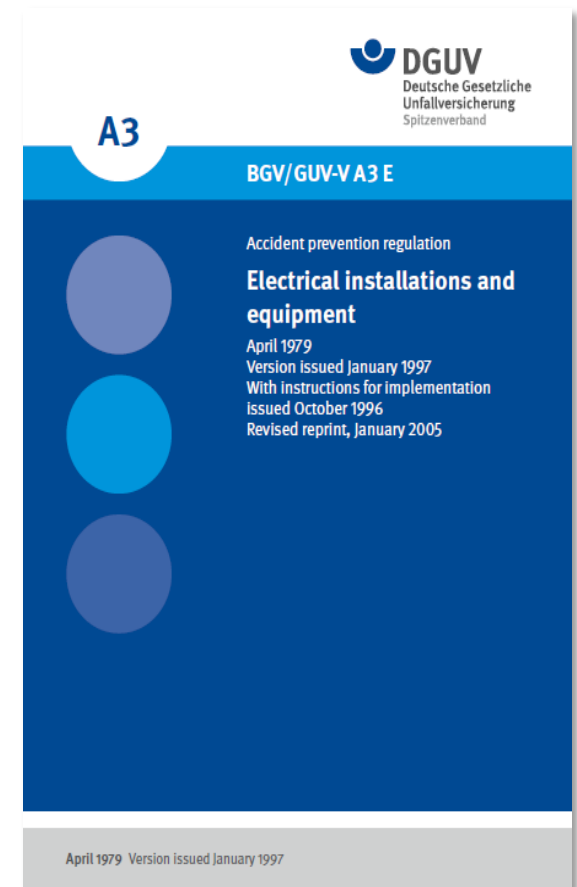
The employer shall ensure, taking into consideration the specifics of the workplace, that in case of an emergency the emergency communication facilities and organisational measures are in place to **call for the necessary assistance immediately** and guide it to where it is needed.

Instructions for implementation for § 8 of Accident Prevention Regulation BGV A3



Live working presents an elevated risk of electric shock and arcing. This gives rise to a need for particular technical and organisational measures.

As part of the organisational safety measures, the work must be **monitored** by a person trained in **first aid** who has to be an instructed person.



General guidelines for safe live working (based on EN 50 110 „Operation of electrical installation“, approved at LWA meeting in May 2009)



- Skilled person
- Age 18 or older
- Medical and psychological fitness
- Theoretical and practical training in live working
- Live working authorization (live working passport)

General guidelines for safe live working (based on EN 50 110 „Operation of electrical installation“, approved at LWA meeting in May 2009)



- Live working must always be carried out by two or more workers
- According to national regulations it **may be possible** after satisfactory **risk assessment** to carry out **some** low voltage live working with **only one** worker
- **First aid training**
(including cardiopulmonary resuscitation)

Daily work examples of distribution network operators

- Clamping ring mounting for creating cable branches e. g. home connections
- Locking, unlocking or exchanging electric metres



Mounting of a clamping ring

- precondition:
clearance certificate of the test
and certification body in DGUV
- application of DGUV 203-031,
e. g. special dismantling tools,
skilled person trained in live
working



That guarantees insulation during the complete mounting works. PPE against electrical risk is dispensable (as well as a second person, unless required for other reasons).

Daily work examples of distribution network operators

- Clamping ring mounting for creating cable branches e. g. home connections
- Locking, unlocking or exchanging electric metres



Locking by disconnecting the conductors at the electric metre and plugging on insulating caps



Locking / exchanging conventional metres

- Live parts are being touched when plugging on insulating caps
- Therefore PPE against electrical hazards is required including isolation from earth



Risk assessment **may** reveal that the environmental conditions (illumination, freedom of movement, safe location) make the presence of a second person unnecessary.

Smart metres

- all live parts at the metre mounting board are fingersafe
- no electrical risk, so neither PPE nor second person are required
- the metre can be read and locked remotely
- that way confrontations over metre disconnections are avoided



Live working accident while mounting a cable branch

- Work order: Renewal of two joints with cable branches
- Disconnection was announced and had to be as short as possible to avoid longer disruption of a business involved
- Agreement with the client (distribution network operator):
Opening of the joints, taking off the setting compound,
cleaning of the cable heads under **dead working conditions**

Live working accident while mounting a cable branch

- Installation of the new cables and mounting of the new clamping rings had to be carried out under **live working conditions**
- Contradictory statements by the client (network operator) and the contractor (installation company) whether the subsequent victim was informed that the voltage was re-energized

Live working accident while mounting a cable branch

- The victim was retrieved only after the cable at the workplace was disconnected (the electric fuse had not triggered)
- He had mounted two phases and the neutral conductor before the accident happened
- Clothing: short-sleeved shirt and light working gloves

Live working accident while mounting a cable branch

What was missing?

- PPE for live working, isolation from earth, suitable tools for live working
- Written definition and working instructions for live working
- The victim's special training for live working
- Designation of a work supervisor

Live working accident while mounting a cable branch

Speculation: did the victim know that the voltage was (already) re-energized?

But: the victim would **likely be still alive** if first aid had been performed in time

BGR A3 „Live working“



Selection of activities

Risk assessment shall also take into account the worker's potential **misconduct**, e. g. slipping with a tool or falling parts.

Question: Is it also a „foreseeable misconduct“ when the worker „forgets“ to wear isolating gloves or PPE against electric arc, e. g. in high temperatures?

Summary

- The future belongs to **safe work processes** in which a worker may work on live parts alone and without PPE against electrical hazards – i. e. **safety will be realised by technical measures.**

This fact complies with the requirement of Council Directive 89/391 EEC, article 6 (T-O-P).

- Work instructions shall specify under what conditions a second person might be dispensable in work processes that **still require** the use of **PPE** against electric shock and arcing.