



SAFETY ALERT

ELECTRICAL HAZARD FROM NEUTRAL CONDUCTORS

This safety alert is published following a recent serious incident, where an electrician sustained an electric shock after cutting into an isolated power circuit cable that became energised via a neutral backfeed on the electrical installation.

Although the power circuit being worked on had been correctly identified and isolated at the distribution board, a number of factors contributed to this incident, including:

- inadequate testing of the power circuit, by relying solely on the use of a voltage proximity tester, commonly known as a 'volt stick'
- failure to undertake a positive test and verify the absence of voltage on the conductors, by using an alternative test instrument such as a multimeter
- the rise in potential to 230 volts of the neutral conductor, once it had been cut by the electrician – this electrical safety hazard arose because of an intermixed circuit on the electrical installation.

OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS

Occupational health and safety legislation requires employers, and those in control of workplaces, to take appropriate steps to eliminate or minimise any foreseeable risk to health, safety and welfare of workers and others in the workplace.

The legislation also requires employers to ensure that electrical work and electrical testing on an electrical installation is carried out using a safe system of work.

RISK CONTROLS

To avoid similar incidents, electrical workers should conduct a site-specific risk assessment and identify the risks associated with the work (including voltages on disconnected neutrals), and use the following control measures:

- Identify the circuits and apparatus to be worked on, and the appropriate sources of power supply.
- De-energise the circuits and apparatus, and isolate from all sources of supply.
- Ensure the supply remains isolated, by locking off and/or tagging the isolator.
- **Test before you touch** – prove and verify the supply is de-energised by using appropriate test methods and approved test instruments, to test for the absence of voltage on all conductors, including the neutral conductor (Note: Volt sticks should only be used as an indicator and should not be relied on to verify if a circuit is energised or de-energised).
- Use appropriate clothing and personal protective equipment.
- When leaving unfinished work, ensure that it does not present a hazard to others at the workplace.



WARNING

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1. The use of a tester for detecting an electric field surrounding an energised conductor may not be suitable for testing cables that are surrounded by a metallic screen, enclosed in a metallic pipe or duct, or cables carrying direct current, and in some other circumstances.
2. When proximity voltage testers are used to prove de-energisation, they must be tested for correct operations immediately before use, and again immediately after use – particularly if the test result indicates zero voltage – to confirm that the instrument is still working correctly.
3. These types of testers must not be relied upon to prove isolation in all circumstances.
4. To confirm a positive indication and to establish the circuit voltage, the use of an alternative test instrument that incorporates a visual display should be used before commencing electrical work.



Voltage proximity testers, or volt sticks

FURTHER INFORMATION

Further information regarding electrical work on an electrical installation can be found in the:

Occupational Health and Safety Regulation 2001 and the *Code of practice for low voltage electrical work*.

Also, visit www.workcover.nsw.gov.au or phone **13 10 50**.

Disclaimer

This publication may contain occupational health and safety and workers compensation information. It may include some of your obligations under the various legislations that WorkCover NSW administers. To ensure you comply with your legal obligations you must refer to the appropriate legislation.

Information on the latest laws can be checked by visiting the NSW legislation website (www.legislation.nsw.gov.au).

This publication does not represent a comprehensive statement of the law as it applies to particular problems or to individuals or as a substitute for legal advice. You should seek independent legal advice if you need assistance on the application of the law to your situation.

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WorkCover NSW 92-100 Donnison Street Gosford NSW 2250
Locked Bag 2906 Lisarow NSW 2252 WorkCover Assistance Service **13 10 50**
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