

# electrical focus

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## Missing MEN Connection Causes Fatality

The electrocution of a 4-year-old child in February 2000 was attributed in part to the fact that the installation did not have an MEN connection.

Energy Safety's investigation into the incident found that contributing factors to the fatality were a faulty rubber sheathed extension cord and the lack of an MEN connection at the main switchboard, resulting in up to 220 volts being impressed onto the metallic piping of the installation.

The Coroner's inquest into the death determined that the deceased, whilst sitting in the bath, received approximately 143 volts when he touched "live" taps. The electric shock caused the deceased to collapse into the bath water and drown.

In her findings, the Coroner made the following recommendations:

- that electricity supply authorities should advise their customers of the importance (and legal requirement) of reporting electric shocks
- that electricity supply authorities should advise their customers that old installations and appliances could be faulty and should be tested/rewired/replaced
- that electricity supply authorities should implement a program to check for installations that do not have an MEN connection
- that the removal of an MEN connection or failure to fit an MEN connection is not only a very serious breach of the *Electricity (Licensing)*

*Regulations 1991* but in appropriate circumstances may be deemed criminally negligent and could lead to criminal charges

- that consideration be given to retrofitting RCDs to properties built before 1991.

The Coroner concluded that there would seem to be no excuse as to why a licensed electrical worker would not understand not only the reasons for the appropriate testing but what constitutes appropriate testing.

## Segregation of Wiring Systems

Some modular combination low voltage/communications outlet boxes, also known as 'pop up' boxes, do not provide/maintain sufficient segregation or insulation between the individual wiring systems. That is, there is not sufficient isolation for extra low voltage and low voltage wiring.

These modular boxes must be installed/connected [by a licensed electrician] in accordance with the segregation requirements of *AS/NZS 3000:2000 Wiring Rules Clause 1.10.4*.

When installing these items, it is important to ensure that the metallic screening of communications/TV antenna cables does not come into contact with the conductors/terminals of the LV parts.

## Energy Safety



## Hazardous Areas – Special Requirements for Electrical Installations

Wherever flammable or combustible materials are handled, there is always a high risk of injury to people, or damage to property, due to fires and explosions, for a variety of reasons.

To reduce the risk of electrical apparatus becoming the ignition source of a fire or explosion, special precautions have to be taken in the design, construction, selection, installation and maintenance of such apparatus.

Hazardous areas of major installations, such as oil and gas production platforms and refineries, are readily identifiable and the necessary design, construction and installation requirements are usually well established. Persons involved with these installations are often specialists in these areas and the safety protocols that are adopted are usually sound.

However hazardous areas such as at fuel dispensers, spray booths, laboratory fume cupboards and fruit ripening rooms, are often located in otherwise non-hazardous installations. It is therefore important that electricians can readily identify such areas and apply the special requirements as necessary.

As well as mandating *AS/NZS 3000 Wiring Rules*, the *Electricity (Licensing) Regulations 1991* also mandate other Standards including *AS/NZS 2381 Electrical equipment for explosive atmosphere* and *AS 2430 Classification of hazardous areas*.

Clause 7.9 of the Wiring Rules outlines the special requirements for installations in hazardous areas. The means by which areas

are classified as being hazardous are specified in *AS 2430.1*, *AS/NZS 61241.3* and *AS/NZS 2430.3*. These Standards relate to areas that are classified as being hazardous due to the presence of flammable gases and vapours and combustible dusts.

The electrical apparatus which is installed in hazardous areas must comply with *AS/NZS 2381* and *AS/NZS 61241.1.2* in terms of its selection and installation.

An important requirement of *AS 2381* is that proof of compliance of electrical installations with hazardous areas requirements must be provided. It specifies that a **verification dossier** which contains evidence of compliance of equipment with Australian Standards or other approved standards, must be kept on the premises. The evidence is to comprise a Certificate of Conformity issued in accordance the Australian National Certification Scheme – the “ANZ Ex Scheme” - or by carrying IEC Ex certification issued in accordance with the IEC Ex Scheme. Details of the ANZ Ex Scheme are provided in the Standards Australia publication *MP87(Int):2001*.

When overhauling or repairing electrical equipment for hazardous areas, the requirements of *AS/NZS 3800:1997 Electrical equipment for explosive atmospheres – Overhaul and repair*, although not mandated by the *Electricity (Licensing) Regulations 1991*, should nevertheless be applied. Competency requirements for persons conducting that type of work are set out in *AS/NZS 4761:2000 Competencies for working with electrical equipment in hazardous areas*.

Guidance on the application of the above Standards is provided in the Standards Australia handbook *HB 13-2000 Electrical equipment for hazardous areas*.

## Next Revision of the Wiring Rules

Standards Australia has commenced the process of revising Australian Standard *AS/NZS 3000:2000 Wiring Rules* for publication by the end of 2005.

As part of the review process, a questionnaire has been developed by Standards Australia, for the electrical industry to provide input to the structure and format of this next revision.

Energy Safety favours a shift in focus, providing for:

- design flexibility - that is, clearly specified fundamental requirements; and
- certainty of compliance – by providing detailed prescriptive solutions.

Additionally, Standards Australia is considering incorporating both technical and editorial enhancements to reflect new developments and user responses to the current edition, as follows:

### Technical revisions

Areas under review that relate to safe electrical installation requirements will include:

- Alignment with IEC 60364 – several parts of the IEC ‘Wiring Rules’ have been, or are being, amended and appropriate technical changes/improvements will be incorporated.
- Wet areas – this is one of the most questioned areas in view of zone arrangements and IP ratings for equipment.

- Surge protection devices – consider voluntary or compulsory installation of devices for protection against over voltages.
- Residual current devices – is there a benefit/need to extend protection beyond the current domestic focus?
- Rewirable fuses – should they be prohibited in new installation work?
- Inspection and testing – provisions for the assessment of existing installations compared with new installation work.
- High voltage installations - depending on progress with IEC TC99 work, this section may be replaced by a new Standard.

### Editorial revisions

Editorial changes to enhance presentation and assist users in understanding the *Wiring Rules* will include:

- Structure/format – the current seven-section format is more appropriate than the format of the IEC Standard but other options will also be considered.
- Package – possible combined packaging in A4 binder of AS/NZS 3000 with AS/NZS 3008 [Cables] and all or a selection of 3001 [Caravans], 3002 [Shows], 3004 [Marinas], 3010 [Generators], 3012 [Construction Sites], 3017 [Testing], 3018 [Domestic Guide], 3080 [Telecommunications], 3700 [In service testing], HB300 [Teaching guidelines], HB301 [Design Guide] etc.
- Text/illustration – incorporation of drawings to clarify and simplify issues such as coordination of protective devices, earthing configurations etc.

- Exemptions – are matters which are an exception or alternative to a common rule, consistently and clearly defined?
- Intent/purpose – are there benefits to be gained from including the intent/purpose in the wording of key requirements?

### Public Liability Insurance

The Electrical Licensing Board is currently carrying out an audit of three hundred licensed electrical contractors to ensure they are meeting the requirements of the *Electricity (Licensing) Regulations 1991* with respect to public liability insurance.

Electrical contractors are required to hold a current policy of insurance with a reputable insurer that provides a public liability indemnity, in respect of the work of an electrical contractor, of at least \$1 million.

Electrical contractors who do not hold a current public liability indemnity insurance policy are in breach of the *Electricity (Licensing) Regulations 1991* and may be subject to prosecution and/or disciplinary action by the Electrical Licensing Board.

### Disciplinary Action Taken by the Electrical Licensing Board

**1 September 2002 to 31 October 2002**

The Electrical Licensing Board dealt with three operatives during this period.

#### COMPETENCY ASSESSMENTS

The following operatives were required to complete a competency assessment, as the Board was not satisfied that they had the ability to work in a safe and satisfactory manner:

- D Hardie
- B McFarland
- B McKenna

#### Dennis Hardie (EW 102067 EC 006875)

Mr Hardie failed a competency assessment on 2 September 2002 and his licence was suspended until he could demonstrate his competency. He did so on 7 October 2002 and his licence was reinstated.

#### Brendan Todd McFarland (EW 127624)

Mr McFarland failed the competency assessment on 4 November 2002 and his licence was suspended until he can demonstrate his competence.

#### Bruce McKenna (EW 112879)

Mr McKenna failed to comply with the requirement to complete a competency assessment within the time specified. Consequently, his licence was suspended on 12 November 2002 and will remain suspended until such time as he can demonstrate his competence.

**PROSECUTIONS FOR BREACHES OF THE ELECTRICITY (LICENSING)  
REGULATIONS 1991 AND ENERGY CO-ORDINATION ACT 1994**

**1 September 2002 to 30 October 2002**

<i>Breach</i>	<i>Name (and suburb of residence at time of offence)</i>	<i>Licence No.</i>	<i>Fine &amp; Court Cost (\$)</i>
<i>Carried out electrical work without holding an electrical workers licence Regulation 19(1) E(L)R</i>	<i>Trevor John Butler (Scarborough)</i>	<i>NLH</i>	<i>717.70</i>
<i>Carried out substandard electrical work Regulation 49(1) E(L)R</i>	<i>Michael Dunlop (Pinjarra)</i>	<i>EW 116716</i>	<i>1,747.70</i>
	<i>Richard MacFarlan (Derby)</i>	<i>EW 127512</i>	<i>1,047.70</i>
	<i>Peter Young (Bassendean)</i>	<i>EW 129908</i>	<i>1,578.10</i>
<i>Permitted unsafe wiring or equipment to be connected to an electrical installation Regulation 50A E(L)R</i>	<i>William Alexander (Greenwood)</i>	<i>EW 107248</i>	<i>1,707.70</i>
<i>Failed to submit a Notice of Completion for electrical work carried out Regulation 52(1) E(L)R</i>	<i>Quality Traffic Management (Maddington)</i>	<i>EC 005971</i>	<i>257.70</i>
<i>Failed to comply with an Inspector's request ECA 20(2)</i>	<i>Michael Roy (City Beach)</i>	<i>NLH</i>	<i>777.70</i>

Legend: NLH No Licence Held  
E(L)R Electricity (Licensing) Regulations 1991  
ECA Energy Coordination Act 1994

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