

The Amendment

OVERVIEW

Electricity Regulations

- In January 2003, the Electricity Regulations will recognise AS/NZS 3000 and its companion Standards as the only means of compliance with the safety objectives applying to electrical installations.
- At the same time, recognition of NZS 3000 and the older ECPs will cease and most of the ECPs will be revoked, their technical requirements having been transferred to the various joint Standards.
- Many of the prescriptive components of the regulations will also have been removed or made applicable only to "Works", their technical requirements also having been transferred to the various joint Standards.
- The fundamental safety performance requirements for electrical installations will be achieved through a mandatory citation of AS/NZS 3000, Section 1.
- The Regulations will retain a number of mandatory technical requirements particularly those relating to interfaces between appliances and installations and between installations and works.
- The Regulations will recognise the majority of the AS/NZS 3000 series of Standards as a means of compliance with the fundamental requirements.
- The requirements applying to the inspection and re-verification of new and existing installations will have been transferred to a New Zealand Standard NZS 3019.
- The Regulations will apply from the 1 January 2003 and hence compliance with the requirements mandated within the Regulations including those relating to RCDs, must be complied with for any installation that is completed and certified after the implementation date.

Thrust of the Regulations Amendment

The changes will be implemented through an amendment to the Regulations which has as its thrust:

- Alignment with Australia
- Alignment with the International Community
- Reduction of Electric Shock Risks
- Completion of a Performance Based System of Regulation
- Introduction of Requirements variously combining Design, Construction, Installation, Maintenance and Use.

Alignment with Australia

- AS/NZS 3000 is based closely on the international standard for installation wiring systems, IEC 60364.
- The close alignment of AS/NZS 3000 with IEC 60364 allows experiences gained in the international community to be applied to improve the safety of New Zealand, and Australian, electrical installations and for New Zealand to benchmark its safety performance against other users of IEC 60364.

Reduction of Electric Shock Risks

The Amendment seeks to improve the safety of electrical installations by reducing the risk of electric shock in both direct and indirect contact situations by:

- Increased requirements applying to the use of RCDs in domestic and residential installations; and by
- Increased requirements applying to the verification of protective device operation.

The requirement to use an RCD to protect socket outlets in damp areas also remains in AS/NZS 3000 for installations in other than domestic and residential premises.

Electric Shock from Indirect Contact

[See Diagram]

Completion of Performance Based System

The amended Regulations applying to electrical installations will contain:

- Mandatory Fundamental Safety Requirements
- Mandatory Technical Requirements
- Recognised Means of Compliance
- Mandatory Requirements applying to Testing, Inspection and Certification

Combining Design , Construction, Installation, Maintenance and Use

- The regulatory changes also implement a transition towards a more consolidated approach to electrical safety, whereby design, construction, installation, maintenance and use are combined together. This is particularly evident in the citation of AS/NZS 2381.1 but also applies in the citation of AS/NZS 3012 and AS/NZS 4249 and AS/NZS 3002.

Note: AS/NZS 3002 introduces new requirements applying to shows and carnivals.

- In these situations a "whole of safety" approach is implemented where the recognised solution requires all elements to be present. For example in the case of a building site, the site is not recognised to be safe simply because the distribution wiring system is compliant with recognised criteria.

Special Situations

Hazardous Areas

- The special requirements that apply to electrical installations in hazardous areas are implemented by the Regulations having a direct citation to AS/NZS 2381.1. The other Standards applying to hazardous areas are cited by AS/NZS 2381.1 including the Standards applying to electrical equipment used in a hazardous areas and the competencies of persons working in hazardous areas. NZECP 24 will be revoked.

Medical Electrical

- The special requirements that apply to the use of electricity in patient treatment are implemented by the regulations having direct citation to AS/NZS 3003, AS/NZS 2500 and AS/NZS 3551. NZECP 12 will be revoked.

Handheld Appliances

- With the recognition of AS/NZS 3012, AS/NZS 4249 and AS/NZS 3002 the requirements of for the safe use of electricity in other circumstances are relaxed and applied only to handheld appliances with a focus on maintaining safety in domestic circumstances.

Note: The provisions relating to handheld appliances apply in all circumstances where AS/NZS 3012, AS/NZS 4249 or AS/NZS 3002 are not being complied with.

Other Changes

- A number of other minor changes will be carried to the requirements applying to testing, inspection and certification. These changes are aimed at making the systems more practical in their application.
- The introduction of the joint Standards will also implement a number of technical changes. Most of these will form part of the presentation of the Standards themselves, however a small number of the changes are achieved through the regulatory system itself. These changes form part of this presentation.

TECHNICAL REQUIREMENTS

Technical Requirements

The Regulations will contain the following:

- Fundamental Safety Requirements
- Mandatory Installation Requirements
- Recognised Means of Compliance
- Requirements for Special Situations (Including Appliances and Safe Use)
- Additional Mandatory Technical Requirements

Fundamental Safety Requirements

The Regulations will establish the fundamental safety requirements applying to electrical installations by:

- Citing AS/NZS 3000 Clauses 1.6-1.10
- Setting fundamental requirements for safety distances.
- Setting requirements for supplies to connectable installations.
- Setting requirements applying to both installation and maintenance.

Mandatory Installation Requirements

The Regulations will contain mandatory requirements relating to the following:

- RCDs
- Other mandatory requirements within AS/NZS 3000 [NZRs]
- Overhead Line Insulation
- Supplies to Connectable Installations
- Unsafe characteristics of Installations

RCDs

The Regulations will mandate the following sections of AS/NZS 3000 which contain the requirements for the installation of RCDs in domestic and residential installations and defines when RCDs are required for additions and alterations.

- Domestic - AS/NZS 3000 Clause 2.5.3.1
- Residential - AS/NZS 3000 Clause 2.5.3.2
- Additions and Alterations - AS/NZS 3000 Clause 2.5.3.4

Other Mandatory Requirements

The Regulations will mandate the following sections of AS/NZS 3000:

- Common Requirements - AS/NZS 3000 Clause 2.2
- Neutral Conductor - AS/NZS 3000 Clause 3.5.2
- Earthing System Parts - AS/NZS 3000 Clause 5.6.1
- Main Earthing Conductor (Labelling) - AS/NZS 3000 Clause 5.6.3.4.2

Overhead Line Insulation

The Regulations will continue to require insulation of the first 20 metres of any overhead conductor supplying an electrical installation.

Supplies to Connectable Installations

The Regulations will contain mandatory requirements as follows:

- Socket Outlets for the supply of connectable installations, excepting IEC 60309 type in caravan parks will require additional protection.
- Socket outlets for the supply of connectable installations will require their protection device to match the socket outlet rating.
- Socket outlets in caravan parks and marinas for the supply of connectable installations will be required to be either IEC 60309 or AS/NZS 3112 rated 15 amps or greater.
- Other types of socket outlets will be permitted to supply connectable installations in accordance with AS/NZS 3001 outside of caravan parks and marinas.

Unsafe Characteristics of Installations

The Regulations will continue to contain technical criteria for installations which are identified as being unsafe.

- General aspects identified as unsafe are provided.
- For damp situations unsafe criteria relating to IP rating, socket outlet protection and switchboards are provided.
- For extra low voltage unsafe criteria are also provided.

Recognised Means of Compliance

- General Installations
- Connectable Installations
- Other Installations

General Installations

For general installations the Regulations will recognise as means of compliance:

- AS/NZS 3000 Sections 2-7
- The "IEC Shock Currents Standard" – IEC 60479

Connectable Installations

For connectable installations the Regulations will recognise:

- Caravan Parks - AS/NZS 3001
- Boat Marinas - AS/NZS 3004
- Connectable Installations:
 - Vehicles and Relocatable Buildings - AS/NZS 3001
 - Caravans – AS/NZS 3001
 - Pleasure Craft - AS/NZS 3004

Other Installations

For other electrical installations the Regulations will recognise:

- Security Fences - AS/NZS 3016
- Cold Cathode Illumination Systems - AS/NZS 3832
- Recessed Luminaires - NZECP 54
- Safety Distances - NZECP 34
- Upgraded Spa Pool Heaters - NZECP 52

Amended Technical Requirements

The introduction of AS/NZS 3000 creates a number of changes in the recognised practices for safe installation wiring. These changes can be grouped into three categories:

- Requirements no longer present. Included in this category is the removal of the specific requirement for the relationship between protective devices and the rating of socket outlets.
- The addition of further technical requirements which now become a part of recognised practices and should be followed unless additional precautions are otherwise taken into account.
- Technical requirements specifically restricted within the Standard for example the restriction on the use of green insulated conductors for other than earthing purposes. These requirements should be followed unless other precautions have been taken to achieve the same safety objectives that the requirements seek to deliver.

Special Situations

The Regulations implement a recognition of safe circumstances which combine design, construction, maintenance and use for both the installation and the appliances used in conjunction with that installation:

- Shows and Carnivals - AS/NZS 3002
- Construction and Demolition Sites - AS/NZS 3012
- Film and Television Sites - AS/NZS 4249

For the specialist situations of medical electrical locations and hazardous areas complete safety regimes are established which contain competency requirements alongside the technical installation and appliance provisions:

- Hazardous Areas - AS/NZS 2381.1
- Medical Electrical Locations:
 - AS/NZS 3003 for installations
 - AS/NZS 3551 for equipment maintenance
 - AS/NZS 2500 for training

Note: There is no current recognition of new equipment standards or periodic installation reverification for medical electrical situations.

The Regulations also provide recognised methods relating to:

- Supply to Connectable Installations through WOEFS through a citation of NZS 3019.
- Hire of Connectable Installations through WOE or CoC through a citation of NZS 3019.
- Protection Against Direct and Indirect Contact by recognition of the "IEC Shock Currents Standard" - IEC 60479.

Additional Regulatory Requirements

The Regulations will contain additional regulatory requirements relating to interfaces between supply systems and installations and between appliances and installations:

- MEN Switchboards
- Main Earthing Systems
- Voltage Drop
- Position of Switches and Protective Fittings
- Socket Outlets for:
 - Polarisation
 - Limitations on 3 pin Sockets
 - Prohibition of Scraping Earth Plugs and sockets

Testing, Inspection and Certification

The Regulations will contain amended requirements applying to the testing, inspection and certification of:

- New Installations
- Existing Installations

Alterations and Additions

Certification will no longer be required for the simple replacement of a fitting.

RCD's

- The Regulations, and AS/NZS 3000, retain the previous requirements for the testing and inspection of RCD's after installation - that of requiring that the RCD performance be "verified".
- This means that where documentation and labelling of the RCD indicate that it is compliant with an appropriate Standard that that RCD need only be tested to trip by operating the test button on that RCD. Where the RCD has no documentation or labelling a full and comprehensive testing system should be implemented.
- The Regulations and Standard also requires that circuits required to be protected by an RCD are verified to be protected by an RCD.

Earth Fault Loop Impedance

- The Regulations and the Standard require the performance of protective devices to meet a 400 milli-second fault clearance time to provide protection against indirect contact.
- This can be verified by using a earth fault loop impedance meter or by calculation or assessment of the circuit impedance.

Certification

Two time periods will be introduced for the completion of a COC:

- A one day period for the completion of the certification following completion of the work or termination of the contract and before connection to a supply and a 20 day period for the supply of the certificate to the person commissioning the work.

New Installations

Additional requirements will apply to the connection of an electrical installation to a supply of electricity that:

- Require the citing of a certificate of compliance prior to connection, and
- Where prescribed electrical work is carried out on works, tests are to be made to ensure that the polarity and phase rotation of the supply is correct for the electrical installations affected by that work.

Existing Installations

The Regulations will continue to contain requirements relating to existing installations in respect to:

- Installations that have been disconnected for more than 6 months
- Electrical installations in service
- Periodic safety checks of specified types of installations
- Warrants of electrical fitness

The Regulations will reference NZS 3019 for:

- Installations that have been disconnected for more than 6 months.
- Electrical installations in service.

Safety Checks

- The regulatory requirements applying to the periodic testing of specified electrical installations have been amended to reference the applicable Standards and introduce timeframes where appropriate.
- The requirements applying to caravan parks and boat marinas will be set through NZS 3019.
- The requirements applying to construction and demolition sites will be set through AS/NZS 3012.
- In line with the adoption of AS/NZS 2381.1, AS/NZS 3003 and AS/NZS 3551 the regulations will not contain the requirement for the periodic checking to be carried out by a registered inspector but in citing the Standards will implement the competency requirements for persons who carry out such safety checks.

- The Regulations will recognise certification forms contained within the referenced Standards for the purposes of certifying safety checks carried out in accordance with those Standards.

Warrants of Electrical Fitness

The Regulations applying to the issue of warrants of electrical fitness will be amended and will contain the applicable validity period for the warrant while the technical requirements applying will be set through a reference to NZ 3019.

The period of validity will be four years from the date of issue.

Appliances

In a similar manner to the requirements applying to installations the Regulations will contain for appliances:

- Fundamental Requirements
- Mandatory Requirements
- Recognised Means of Compliance
- Additional Regulatory Requirements
- Supplemented by requirements for certain electrical “appliances” to be approved or certified prior to sale and for other specified appliances to be covered by a supplier declaration.

*For information on these appliances see:
www.ess.govt.nz/product/electrical_appliance_safety_regime.html*

Fundamental Requirements

The fundamental requirements applying to appliances are set through a mandatory citation of AS/NZS 3820.

Recognised Means of Compliance

The Regulations recognise safe appliances as being:

- In conformance with AS/NZS 4417 - Application of the RCM.
- Tested to Recognised Standards by Recognised Testing Laboratories.
- For upgraded Spa Pool Heaters compliance with NZECP 52.
- For recessed luminaires compliance with NZECP 54.

Additional Regulatory Requirements

The Regulations will contain Additional Regulatory Requirements for Electrode Boiler Humidifiers to be compliant with AS/NZS 3350.2.98 or have an RCD in their supply cord or plug.

Testing Inspection and Certification

The Regulations will contain requirements for the testing inspection and certification of:

- Repaired Appliances will be required to have been tested for operational safety. Testing in accordance with AS/NZS 3760 will be recognised as confirming operational safety.
- Appliances Inservice
 - Compliance with AS/NZS 3760 will be recognised as being safe.

- Second-hand Appliances complying with AS/NZS 3760, NZECP 52, AS/NZS 4701 will be recognised as being safe.
- Hired and Leased Appliances complying with AS/NZS 3760 will be recognised as being safe.

Handheld Appliances

- The Regulations will contain requirements for the safe use of handheld appliances not being used in compliance with a recognised method of safety.
- These requirements reproduce those previously applying to appliances used out of doors or in damp situations but only apply to handheld appliances.

Works

The Electricity Regulations will also contain amended requirements applying to works including:

- Restrictions on interfering with the physical stability of the electricity supply system components by moving any ground or materials that support power poles etc.
- Restrictions on moving materials or ground under or near overhead lines so as to reduce the safety clearances of those lines.

Definitions

The definitions applying to Installation work are spread between the Electricity Act, Electricity Regulations, and AS/NZS 3000 and it's companions depending on their particular application.

Under the Electricity Regulations the definitions still required remain as before but where appropriate the Regulations will reference AS/NZS 3000 and IEC 60030 for other defined terms.

A copy of the Definitions from the Electricity Act is attached to these notes.

Looking to the Future

The Energy Safety Service has a preference for the development of the AS/NZS 3000 series of standards to be along the following guidelines:

- Maintaining a stable platform for AS/NZS 3000.
- Development of technical requirements applying to the safety reverification of existing installations.
- Development of clear requirements for the extension of existing installations.
- Development of clear requirements for the upgrading of existing installations.
- Progressing the adoption of the remaining sections of IEC 60364.

DEFINITIONS

Reproduced from the Electricity Act

“Approved” means approved by the Board.

"Associated equipment" means any equipment that is used, or designed or intended for use, in connection with any works or electrical installation, where such use is for construction, maintenance, or safety purposes and not for purposes that relate directly to the generation, conversion, transformation, conveyance, or use of electricity.

"Board" means the Electrical Workers Registration Board established by section 148 of this Act.

"Connectable installation, in relation to a vehicle, a relocatable building, or a pleasure vessel. means an electrical installation of that vehicle, relocatable building, or pleasure vessel that is designed or intended for, or capable of, connection to an external power supply that operates at or above such voltage as is prescribed for the purposes of this definition by regulations made under section 169 of this Act; and includes any electrical appliance that is connected, or intended to be connected, to any such installation.

“Construct” includes to erect, to lay, and to place; and "construction" has a corresponding meaning.

"Electrical appliance" means any appliance that uses, or is designed or intended to use, electricity, whether or not it also uses, or is designed or intended to use, any other form of energy.

"Electrical code of practice" or "code" means an electrical code of practice issued pursuant to section 36 of this Act.

"Electrical installation"

- (a) Means all fittings -
 - (i) That form part of a system for conveying electricity; and
 - (ii) That form part of such a system at any point from the point of supply to a consumer to any point from which electricity conveyed through that system may be consumed; and
- (b) Includes any fittings that are used, or designed or intended for use, by any person, in or in connection with the generation of electricity for that person's use and not for supply to any other person; but
- (c) Does not include any electrical appliance

"Electrical wiring work" means prescribed electrical work that consists of any of the following work.

- (a) The installation or maintenance of electrical wiring
- (b) The connection or disconnection of fittings to or from electrical wiring

"Fittings" means everything used, or designed or intended for use, in or in connection with the generation, conversion, transformation, conveyance, or use of electricity.

"Maintain" includes to repair; and "maintenance" has a corresponding meaning.

"Pleasure vessel" has the same meaning as in section 2 (1) of the Shipping and Seamen Act 1952.

"Point of supply" in relation to any premises, means the point at which fittings used or intended to be used for the purposes of supplying electricity to those premises enter those premises.

"Power supply" means a supply of electricity.

"Prescribed electrical work" means electrical work prescribed in regulations made under section 169 of this Act, being work that falls into any of the following categories:

- (a) The construction or maintenance of electrical installations
- (b) The maintenance of electrical appliances
- (c) The connection or disconnection of works, electrical installations, and electrical appliances to or from a power supply, other than by means of -
 - (i) A plug; or
 - (ii) An appliance inlet; or
 - (iii) A pin -
that is inserted into a socket outlet
- (d) The construction or maintenance of works.

"Relocatable building" means any structure designed or adapted for human occupation that is designed to be relocatable; but does not include any tent.

"Vehicle" has the same meaning as in section 2 (1) of the Transport Act 1962.

"Works" -

- (a) Means any fittings that are used, or designed or intended for use, in or in connection with the generation, conversion, transformation, or conveyance of electricity; but
- (b) Does not include -
 - (i) Any fittings that are used, or designed or intended for use, by any person, in or in connection with the generation of electricity for that person's use and not for supply to any other person; or
 - (ii) Any part of any electrical installation.