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AW-E - Practical Electrical Wiring Standards - ASNZ 30002007

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Short Description

This manual aims to familiarise readers with the requirements of standard AS/NZS 3000:2007, commonly known as Australia-New Zealand Wiring Rules. For those installations covered in the scope of this standard, its provisions are mandatory and must be followed. Any engineer involved in planning and design of electrical systems, their installation or maintenance must have a clear idea about the various requirements contained in the standard.

Description

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The introductory sections of this manual outline the basic principles that should be understood for a better appreciation of the standard. These include sections which illustrate the calculation for the power demand of a system and the computation of earth fault current as discussed in the appendices of the standard, which are informative in nature but yet are very important in making an

electrical system safe for operation. The actual provisions of the standard are then discussed in detail in the subsequent sections. Note: This manual is NOT the standard itself, it is a guide to the implementation of the standard.

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Introduction to AS/NZS 3000:2007

The latest edition of AS/NZS 3000 Wiring Rules was published in the year 2007 and had been updated with an amendment in 2009. This standard, approved by the council of standards in Australia and New Zealand, defines the regulations to be adopted in selection, design and installation of Electrical distribution systems mainly falling under low voltage category. In this chapter we will go through the history of this standard and the objectives with which this standard had been framed along with a review on the needs and benefits of such regulations. The chapter also includes an overview on the scope of this standard with brief introduction to the various topics covered in the standard and how they are organized in the latest publication before going into a more detailed discussion on each of the sections and their importance in the subsequent chapters.

Learning objectives

- Objectives of the course
- Need for regulations
- Background and evolution of AS/NZS 3000
- Objectives of the AS/NZS 3000 regulations
- Scope of Wiring Rules
- General exclusions
- Other related standards and regulations
- Arrangement of AS/NZS 3000\

1.1 Objectives of the course

The objective of this course is to familiarize the participants with the Australian / New Zealand Wiring Rules (Fifth edition) published as Australia / New Zealand standard AS/NZS 3000: 2007. This standard covers the requirements to be adopted for electrical installations of nominal voltages up to and including 1000V a.c. and 1500V d.c. It contains stipulations covering issues of safety, selection, installation testing and verification of electrical equipment in common areas as well as in special locations. The topics contained in the standard are of interest and relevance to all practitioners of electrical technology whether they are designers of electrical installations, erection engineers or personnel responsible for operation and maintenance of the installations.

In order to appreciate the requirements and stipulations contained in the standard better, it is necessary to have a clear understanding of the fundamental principles that the standard aims to address. In preparing this manual an attempt has been made to give the reader an insight into the relevance of the stipulations of the standard by first touching upon the basics of the relevant aspects of electrical theory before going on to study the requirements contained in the standard. As such the chapters of this manual cover the following main objectives of this course.

- Review the basic electrical theory related to selection of equipment and circuit connections in low voltage systems and the importance of the regulations defining the rules for safe use of electrical equipment and systems
- Review the important and basic safety aspects related to electrical systems covering insulation, enclosure, earthing, etc.
- Review the various sections and requirements of AS/NZS:3000-2007
- Areas of applications of these regulations in Electrical installation
- Understand the simple calculations for these systems related to conductor sizes, main and earthing conductor sizes, maximum demand, etc. to ensure safe design and reliable operation
- Review on the recommended checks and tests to be carried out in an electrical installation before energisation and also periodically to ensure its longevity.

1.2 Need for rules and regulations

Today the rules and regulations have become necessary to ensure that the people in the society get fair deal in every aspect of their daily life. These can range from the basic need for food to specific needs related to the travel, dresses, etc. With Electricity becoming an important commodity in the modern society it is necessary to ensure that it is used in a safe and reliable manner. The

electrical system today comprises of power generation limited to specific locations in a country but its transmission, distribution and consumption being extended to all the parts and remote corners, in an extensive and elaborate manner. Hence it is absolutely essential that the distribution systems and consumer equipments are designed and installed with features that would ensure safe consumption of electricity and also help regular maintenance, revamping, additions/ alterations, etc in a safe way. With due consideration for the same, regulations have been brought in to specify the kind of features essential for the safe use and also strictly enforced as rules to fulfill the following.

- To ensure uniform practices in the construction/ installation for enabling interchangeability for identical equipment when needed and also for avoiding interchangeability when not desired to meet the fundamental safety aspects.
- To ensure a stable source of supply and loads in the system for longevity in service of the equipment as well as for the electrical systems.
- To define the aspects that are to be considered in the design of the systems such as characteristics of available supply, nature of demand, emergency supplies for safety services, environmental considerations, conductors to be used, type of wiring, protective equipment, emergency control, isolation and switching, accessibility for operation etc in order achieve the earlier two.
- To ensure availability of correct and dependable electrical equipment to suit the voltage and frequency of the supply system followed in the country.
- To enable the designers in selecting correct and matching devices that shall be uniformly available in the market satisfying basic safety needs
- To make certain that the manufacturers, designers and installation contractors follow uniform regulations for the safety of people, properties and livestock coming in close contact with these systems in day to day life
- To support quality and reliability of installations and equipments for safe and continuous service.
- To ensure safety against shocks, and also against failures or damages due to thermal effects consequent to over current, fault current and over voltage.
- To aid equipment erection using good workmanship and proper materials, use of conductors with proper sizing and rating, proper jointing and connections at terminal points, installations in a manner not to cause temperatures in excess of the design temperatures and verification and testing of equipment periodically to avoid degradation.

We will illustrate few of these major objectives further.

1.2.1 Ease of Interfacing

Imagine for a moment, that there are no standards for electrical appliances. The result would be that each product manufacturer might choose a different voltage rating for his product. It would mean that we will have electrical heaters, ovens, toasters etc. each of different voltage, different plugs, etc that cannot work on a common electrical system but would require tailor made system to serve their purpose. Your power supply company might have a distribution voltage that is unsuitable for any or all of your gadgets. This obviously is not helpful and not desirable.

Thus a standard has to be established and its adherence made mandatory within a national or geographical entity so that generation, transmission, distribution and utilization of electrical energy are done at stipulated voltages and frequency which will vary only within acceptable bands specified for each parameter.

Such a standard enables the designer of an appliance to choose a suitable voltage and frequency at which the appliance can function and also the variations of these parameters which have to be taken care of in the design for the operational range of the appliance. It also allows the designer to select appropriate conductors and configuration of power supply connectors forming part of the appliance.

In turn, this enables people to buy an off-the shelf appliance and connect it to the electrical outlet at home and use it without worrying too much about the suitability of the appliance for the electric supply provided by the power company. Anyone who has traveled with a device made in one country and tried to use in another where different standards prevail would certainly appreciate the convenience which uniform standards provide us with.

Also the use of standards reduces the number of variant appliance designs a manufacturer has to plan and manufacture; an issue which will have adverse cost implications to the manufacturer and hence to the buyer. Low cost mass production is thus a direct result of standards benefitting millions across the globe.

1.2.2 Ensuring Quality of supply, equipment and installation

Equipment and installations have to deliver functionalities for which they are designed without any undue hazards to the users or the environment for their entire design life under varying operating conditions. The provisions of a standard therefore define the parameters for functionality, safety and maintainability. They

also contain stipulations that lay down the tests that the device has to withstand to either prove a design (by what are called Type tests conducted on prototypes or selected samples) or ensure that the output and quality parameters are met (by Routine Tests done on each piece manufactured). Thus when you buy an appliance or equipment that is declared as conforming to a particular standard, you have an assurance that it will perform under conditions defined by the standard, is safe to use and will deliver the output or functionalities which the manufacturer furnishes in accordance with the standard for the period it is expected to serve.

An installation standard has a similar objective too. When an installation is carried out in accordance with a standard, it has to follow the methodologies stipulated in the standard using recommended accessories which, in turn will ensure that the installation achieves the intended quality minima, is safe for personnel and environment, and will have adequate provisions for maintainability. An installation standard also usually lays down the procedures for initial inspection and testing for certifying that the installation is fit to be put in service and the periodicity and detail of subsequent inspections and testing to ensure that it is fit to remain in service till the next scheduled inspection.

1.2.3 Ensuring safety

The regulations also specify some of the finer aspects related to the practices to be adopted right from basic design, during selection, installation and also tests/ verifications to be carried out periodically so that the people and livestock in close proximity to these systems are protected against various hazards commonly prevailing in such systems. The following are some of the main regulations defined in the standards and are expected to be followed by the system designers so that safety becomes part of the design, selection and installation when the systems are put into use.

- Regulations for protection against direct and indirect contacts that otherwise could lead to shocks
- Regulations for enclosure and equipment design features for protection against thermal effects, over current, fault current and over voltage that otherwise could lead to fire accidents or equipment failures.
- Methods to be followed for selection of electrical equipment with guidelines for properly sizing the conductors, providing emergency services, safe isolation and switching, accessibility, etc
- Erection methods to be followed to ensure minimum quality with consistent workmanship by use of proper materials, proper jointing and connections and methods to safeguard against high surface

temperatures, etc
- Regulations and mandatory procedures for inspection and testing of equipment by competent personnel to ensure that the installed equipments meet some basic characteristics desired in the regulations and also are having provisions for taking out the failed equipments from service without impacting the healthy equipments.

1.3 Background and evolution of AS/NZS 3000

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-001, represented by the following agencies/ authorities.

- Association of Consulting Engineers Australia
- Australian Building Codes Board
- Australian Electrical and Electronic Manufacturers Association
- Canterbury Manufacturers Association New Zealand
- Communications, Electrical and Plumbing Union
- Consumers' Federation of Australia
- Electrical and Communications Association (Qld)
- Electrical Contractors Association of New Zealand
- Electrical Regulatory Authorities Council
- Electrical Safety Organization (New Zealand)
- ElectroComms and Energy Utilities Industries Skills Council
- Energy Networks Association
- Engineers Australia
- Institute of Electrical Inspectors
- Ministry of Economic Development (New Zealand)
- National Electrical and Communications Association
- New Zealand Council of Elders
- New Zealand Electrical Institute
- Telstra Corporation Limited

The earlier 2000 edition superseded Australian standard AS 3000:1991, Electrical installations – Buildings, structures and premises (known as SAA Wiring Rules). In New Zealand the 2000 edition had superseded selected parts of NZS 3000:1997 Electrical installations – Buildings, structures and premises (known as the NZS Wiring Rules). The 2000 edition had been further updated with Amendments No. 1 (September 2001), No. 2 (April 2002) and No. 3 (July 2003).

The development of the 2007 edition of the standard had been based on the following considerations by the council of standards.

- Feedback from the electrical industry indicating that the industry favored a document better suited to the prevailing electrical regulatory structure, which flows more logically and is easier to understand. The industry also felt that much of the guidance information in the 2000 edition shall have to be replaced with an increased level of diagrammatic representation of concepts, along with more selected examples to aid the designers and users in a better way.
- Feedback from the end users based on their experience gained from the application of the earlier edition guidelines in their installations.

During preparation of this Standard, reference was made to IEC 60364, Electrical installations of buildings (all parts) and acknowledgment is made of the assistance received from this source. The 2007 edition had been published on 12 November 2007 after being approved on behalf of the Council of Standards Australia on 19 October 2007 and on behalf of the Council of Standards New Zealand on 9 November 2007. The edition had been improved with additional diagrammatic representation of concepts and by including more practical examples adopted in the user installations as desired by the industry. The edition is divided into two parts with Part 1 (Section-1) covering Scope, application and fundamental principles of safe electricity use and is generally made complete in itself without cross-referencing to Part 2. The edition also establishes the ‘deemed to comply’ status of AS/NZS 3018 relating to simple domestic applications.

Some of the main features of AS/NZS 3000 are as below

- Contents are generally similar to the contents in IEE Wiring Regulations available as BS 7672 and customized with inclusion of Australia and New Zealand practices.
- The original edition of AS/NZS 3000:2007, section 7 briefly covered some requirements to be followed in HV installations as part of special Electrical installations, but the same had been substantially deleted in the 2009 amendment, as these HV installations are covered by another updated standard.
- Part-1 maintains alignment with IEC 60364 developments at the level of essential safety.
- Part-2 (Sections 2 to 8) covers Installation Practices and generally restores information contained in AS 3000-1991 as requirements, recommendations and examples of typical, effective compliant solutions.
- New introductory selection and installation clauses have been included in Sections 2 to 7.
- Failure to comply with a work method provision in Part 2 is considered as

breach of high level safety conditions stipulated in part 1 unless an alternative mechanism is satisfied to provide a similar level of safety.
- It generally retains the structure of AS/NZS 3000:2000, except that Verification (inspection and testing) has been moved to the final section considering that this is the last function performed in an electrical installation.
- Testing and inspection provisions have been updated in alignment with AS/NZS 3017 – Electrical installations Testing and inspection guidelines

1.4 Objectives of AS/NZS 3000

The main objective of Regulations for Electrical installations in any country is to provide the rules for the design and erection of electrical installations for safety and proper functioning. It is also necessary that when use of a new material or invention in an installation results in deviation from one or more stipulations already prevailing in the regulations, the degree of safety shall not get compromised by such deviation. The fact of such use shall also be recorded on the electrical installation certificate as reference for anyone who is concerned with the safe functioning of the installation. Keeping these basic objectives and to enable ease of understanding of the regulations, the AS/NZS 3000 Wiring rules standard is divided into two main parts – Part 1 and Part 2.

Part 1 is framed to serve the following objectives:

- To be self sufficient without cross-referencing to Part 2 so that part-1 may be considered either as a separate standard or can be followed along with Part 2.
- To describe ‘high level’ safety performance conditions to be met in the electrical installations without elaborate work methods.
- To maintain alignment with IEC 60364 requirements at the level of essential safety.
- To establish an enforcement link to Part 2 in such a way that failure to comply with a work method defined in Part 2 would lead to compromising high level safety conditions defined in Part 1 unless an alternative mechanism is satisfied and agreed by the parties concerned.
- To be open for acceptance of alternative design and installation practices compared to those given in Part 2. This had been considered with a mechanism that is basically intended for significant departures from the methods stipulated in Part 2 rather than for minor alterations that still remain within the flexibility of Part 2.
- While considering any alternative method to those contained in Part 2, this part 1 details responsibilities, documentation and verification

requirements to be followed by the designers and installers that seek to comply with the essential safety requirements of Part 1.

Part 2 satisfies the following objectives:

- To be called up in regulation in addition to Part 1 to reflect a range of regulatory adoption options.
- To incorporate and elaborate requirements and recommendations that clarify and support compliance of the ‘high level’ performance outcomes expected from Part 1.
- To avoid overly conservative or obscure measures. Instead, emphasis has been placed on common, practicable and cost-effective methods that achieve safety compliance, fitness for purpose and a level of good practice.
- To promote understanding of common or difficult aspects by incorporating more illustrations and examples e.g. line diagrams, alternative overcurrent device locations, International Protection (IP) rating summary, switchboard access, etc.
- Updating of the Testing and inspection provisions in alignment with AS/NZS 3017, including provisions for periodic inspection in accordance with AS/NZS 3019.

1.5 Scope of AS/NZS 3000 Wiring Rules

The principal application of this Standard is to electrical installations in all types of premises and land used by electricity consumers. The wiring rules stipulate the minimum requirements to be followed for the design, construction and testing of electrical equipment and installation in a safe manner so as to protect persons, livestock and property from electric shock, fire and physical injury hazards that may arise from the installation (for new installations as well as for modifications/ additions). This standard may also be referenced for requirements relating to electrical installations in matters such as

- Safety of workplaces. (Occupational Health and Safety legislation and associated codes).
- Safe design/construction of buildings (like Building Code of Australia, New Zealand Building Code)
- Electricity generation, Transmission & Distribution systems.
- Safe connection to electricity distribution systems.
- Qualifications of electricity workers.

Following are some of the important updates and changes considered in the

latest edition compared to the one published in the year 2000

- Requirements for damp situations have been separated from other special electrical installations and had been covered in a separate section as they are the more commonly occurring in many normal electrical installations including residential houses and buildings.
- New illustrations showing normal and alternative location/ omission of over current devices, switchboard clearances, Generator supply interconnections, etc.
- Acceptability of single main switch (per tariff) for a single domestic installation.
- Discrimination and selectivity procedures to be adopted for protective devices
- Arc fault protection MUST for all switchboards with a nominal supply rated above 800 A
- Expansion of the use of residual current devices (RCD's) to all socket outlet and lighting circuits up to 20 amperes and limiting the number of circuits connected to any one RCD to three.
- Specifying the requirements for full size neutral conductors
- Allowance for a voltage drop of up to 7% where a substation is located on the premises.
- Additional details related to earthing rods, earthing requirements, etc
- Additional appendices with worked out examples for ease of understanding and adoption.
- Segregation distances of electrical services from other common services like telecommunication, water lines, etc.
- Inclusion of mandatory tests like verifying RCD operations (Australia) and verification of earth fault-loop impedance for socket-outlet circuits not protected by an RCD (in Australia and New Zealand)

1.6 General exceptions and exclusions

The stipulations specified in AS/NZS 3000 are generally applicable for low voltage installations, mainly on basic safety requirements as appropriate. However the following installations might call for special and exclusive requirements, for which the relevant standards identified within brackets, shall be referred to understand all prerequisites. It is also likely that relevant authorities may still insist some specific conditions at their discretion.

- Use of generating sets for the supply of electricity at voltages normally exceeding 500V a.c. or 120V d.c. (AS/NZS 3010)
- Open-cast mines, quarries, stockpiles and other industrial areas exposed

to particularly onerous environmental and operational conditions subject to requirement by relevant authorities.

- Electric fences (AS/NZS 3014 and AS/NZS 3016)
- Film, video and television sites (AS/NZS 4249)
- Railway traction, rolling stock and signaling systems
- Motor vehicles and equipment on board ships, off shore installations and aircraft
- High Voltage substations (Follow revised AS 2067 in Australia and requirements of the New Zealand Electrical Regulations in New Zealand.)
- Enclosure of telecommunication cables with other wiring systems (AS/ACIF S009 and for New Zealand in PTC 103 and PTC 106)

As applicable in any country, the wiring rules does NOT cover the requirements for design/manufacture of electrical equipment but limits itself to their selection and application in electrical installations.

1.7 Other related regulations and standards

Appendix A of the standard provides detailed list of other regulations and standards that are referenced in the rules and are considered to be mandatory in application of relevant systems as applicable. The standards and publications referred under clause A1 of Appendix A presents a list of documents, compliance with which is called up as a mandatory requirement of this standard. Clause A2 of the same appendix provides a list of reference documents that are intended for information or guidance. Table 1.1 tries to identify some of the important standards that are to be additionally reviewed by the practitioners to ensure compliance with the stipulations in AS/NZS 3000.

Table 1.1

Partial list of standards/ regulations referred in AS/NZS 3000

Standard	**Title**
AS 2067	Switchgear assemblies and ancillary equipment for alternating voltages above 1 kV
AS 60269	Low-voltage fuses
AS 60947	Low-voltage switchgear and controlgear
AS 60947.2	Part 2: Circuit-breakers
AS 60947.4.1	Part 4.1: Contactors and motor-starters—Electro mechanica contactors and motor-starters
AS 60947.8	Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines

AS/NZS 2430	Classification of hazardous areas
AS/NZS 3008	Electrical installations—Selection of cables—Cables for alternating voltages up to and including 0.6/1 kV
AS/NZS 3008.1.1	Part 1.1: Typical Australian installation conditions
AS/NZS 3008.1.2	Part 1.2: Typical New Zealand installation conditions
AS/NZS 3439	Low-voltage switchgear and controlgear assemblies
AS/NZS 3439.1	Part 1: Type-tested and partially type-tested assemblies
AS/NZS 3439.2	Part 2: Particular requirements for busbar trunking systems (busways)
AS/NZS 3439.3	Part 3: Low-voltage switchgear and controlgear assemblies Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use
AS/NZS 3439.5	Part 5: Particular requirements for assemblies intended to b installed outdoors in public places—Cable distribution cabin (CDCs) for power distribution in networks
AS/NZS 3820	Essential safety requirements for low voltage electrical equipment
AS/NZS 5000	Electric cables—Polymeric insulated
AS/NZS 5000.1	Part 1: Electric Polymeric insulated cables for working voltages up to and including 0.6/1 (1.2) kV
AS/NZS 5000.2	Part 2: Electric Polymeric insulated cables for working voltages up to and including 450/750 V
AS/NZS 61009	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs)
BCA and NZBC	Building Code of Australia (BCA) and the New Zealand Building Code (NZBC)

A number of other standards covering fire protection systems, storage battery systems, hoists, elevators, etc are also listed for further reference and guidance, which are not covered in this table.

1.8 Arrangement of AS/NZS 3000

As already noted, the standard is separated with two parts consisting of eight sections in total. Following paragraphs briefly describe the contents and arrangement of the standard.

1.8.1 Part-1

Part-1 of the standard includes one section i.e. Section-1 – Scope, application, fundamental principles which provides general conditions to be met by the installations for safety and reliability.

This section covers:

- Definitions for various electrical terms commonly referenced within the standard and also in the distribution systems
- Protection requirements to be followed for preventing direct and indirect contacts like providing Barriers, use of extra low voltage (ELV) supply, keeping live parts out of reach, automatic disconnection, etc
- Principles of protection against over current, earth fault, etc
- Basic requirements for design and installation of electrical systems
- Requirements for new installations as well as for additions and modifications to an existing installation

1.8.2 Part-2

Part-2 of the standard includes the balance sections 2 to 8 with individual sections comprising rules and regulations for specific areas and applications as noted below.

Section-2 is titled General arrangement, control and protection and mainly covers the requirements for switchgear and control gear stipulating rules and regulations on:

- Arrangement of Electrical installation to ensure protection against indirect contact.
- Control of the electrical installation (or parts thereof) by means of suitable switching arrangements.
- Protection against over current or excess earth leakage current conditions.
- Protection against over and under voltages.
- Design, selection and installation of switch boards.

Section-3 Selection and installation of wiring systems covers stipulations related to:

- Protection against external influences like stress and environmental conditions like temperatures
- Steps needed to avoid mutual detrimental influences for multiple conductors in an installation

- Selection of conductors to satisfy current-carrying capacity, voltage drop and other minimum size requirements
- Steps needed for reliability and electrical continuity of connections, joints and terminations
- Identification (by color or other means) for safety and maintenance
- Fire protective measures

Section-4 Selection and Installation of appliances and accessories includes rules to be followed by installations for common electrical equipments/ appliances like lamps and other appliances, socket outlets, heating systems, , UPS, other standby sources, motors, transformers, Capacitors, etc. The section covers installation requirements for such appliances to take care of:

- Protection against physical injury.
- Protection from thermal effects.
- Methods of connection to the electrical installation.
- Isolation and switching.
- Protective devices.

Section-5 Earthing arrangements and earthing conductors describes:

- Difference between Protective and functional earthing
- Recommended earthing resistance values in accordance with the protective and functional requirements of the electrical installation for them to be continuously effective.
- Adequately robust or additional mechanical protection appropriate to the assessed conditions of external influence
- Guidelines for the sizing and selection of earthing system components such as electrodes and conductors

Section-6 Damp situations stipulates requirements applicable for:

- Electrical installations in wet areas like bath rooms, showers, pools, fountains, saunas, etc.
- Area classifications to be considered for providing electrical distribution in these areas
- Protection methods against electrical shocks in such damp areas
- Selection and Installation of Electrical equipment covering switches, luminaires, socket outlets, switchboards, etc

Section-7 Special Electrical installations includes:

- Electrical systems for safety services (Emergency services).
- Electricity generation systems.
- Protection by electrical separation.
- Extra-low voltage electrical installations.
- High voltage electrical installations.
- Installations in areas where an explosive hazard may arise.
- Construction/demolition sites, medical treatment areas, cranes/hoists, lifts, generating sets, carnivals, telecom network power supplies, etc

Section-8 Verification identifies the requirements of testing and verification of electrical installations covering:

- Inspection and tests needed to check that an installation meets AS/NZS 3000 wiring rules
- Precautions to be taken to ensure the safety of persons and to avoid damage to property and the electrical installation equipment during inspection and testing.
- Verification involves visual inspection prior to testing followed by actual testing.
- Sequence of inspection and testing
- Mandatory tests to be conducted for acceptance of an electrical installation along with acceptable results for the tests.

1.8.3 Appendices

Following are the appendices included at the end of AS/NZS 3000 with appendix-K, referred below, having been deleted in the latest amendment (year 2009) of the edition.

- Appendix A – Referenced Documents
- Appendix B – Circuit Protection Guide
- Appendix C – Circuit Arrangements
- Appendix D – Aerial Lines Data
- Appendix E – Requirements in National Building Codes
- Appendix F – Installation of Surge Protective Devices
- Appendix G – Degrees of Protection for Enclosed Equipment
- Appendix H – WS Classification of Wiring Systems
- Appendix I – Protective device ratings and metric Equivalent sizes for imperial cables used in alterations additions and repairs
- Appendix J – Symbols used in this standard
- Appendix K – High Voltage Electrical Installations
- Appendix L – Electric Shock Survival – Australia

- Appendix M – Electric Shock Survival – New Zealand

1.9 Summary

The regulations are needed to ensure uniform practices adopted in all equipment and installation practices for safety and reliability of the installations. AS/NZS 3000 standard covers regulations to be followed for design, selection and installation of LV electrical systems of common and special premises in Australia and New Zealand. The 2007 year edition had been updated with many illustrations and worked out examples compared to the earlier edition based on the feedback from industry and the end users. The standard is divided into two parts. Part-1 of the standard provides basic compliance requirements to be met in the design, selection and installation of the systems with an objective to achieve high level of safety in the systems without referencing part-2. The second part is divided into a number of sections and outlines guidelines and procedures to be adopted by the designers and installation contractors for achieving the high level safety objectives of part-1 in specific application areas.

This book is not intended to replace the AS/NZS Wiring Rules as a work of reference but is merely an introduction to it. As all of us are aware, the standards are dynamic in nature in the manner that they continuously undergo amendments and revisions to match the pace of the growth in the technology. In case further information is required it is recommended that the participants shall directly refer the standard as well as other references such as the reference documents identified in appendix A of the standard. A lot of published literature is available on these topics by industry bodies and reputed manufacturers of electrical equipment as well as on the Internet and can be referred for assistance in solving specific problems one may come across.