



Department of Consumer  
and Employment Protection

*EnergySafety*

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# **PRESENTATION TO ELECTRICAL CONTRACTORS & ELECTRICAL CONSULTANTS**

CHANGES TO THE TECHNICAL AND SAFETY  
REGULATION FRAMEWORK FOR THE ELECTRICAL  
INDUSTRY IN 2008, WESTERN AUSTRALIA

## **The presentation will cover:**

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**Part 1:** A brief overview of the technical and safety regulation framework for the electrical industry in WA, including important recent changes.

**Part 2:** The changes to regulations covering electrical licensing and installation requirements, which will become effective mid 2008.

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**Part 3:** Wiring Rules, WAER and HV Installation Changes

**Part 4:** Code of Practice for Safe Electrical Work on Electrical Installations

**Part 5:** Overview of WA's Electrical Safety Outcomes

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Questions will be taken at the end of Part 2, then a brief break, after which Parts 3 – 5 will be presented. Then more questions can follow.

A copy of all the slides shown will be handed out at conclusion.

# PART 1 – OVERVIEW OF REGULATORY FRAMEWORK AND CHANGES

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- EnergySafety is an independent regulator through the statutory functions of the office “Director of Energy Safety” created by Part 2 of the *Energy Coordination Act 1994*. It is part of the Department of Consumer & Employment Protection, which also has other safety regulation divisions (e.g. WorkSafe, Resources Safety).
- EnergySafety is fully funded by industry through a levy on electricity and gas distributors and through licence fees for electrical and gas workers and contractors.

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- The electrical industry regulatory framework administered by *Energy Safety* is as shown in the following slides.
  - The *Energy Coordination Act 1994* not only establishes the office of the Director but provides for the powers of all inspectors (including order-making powers) and their appointment by the Director, through the *Energy Coordination (General) Regulations 1995*.

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- These regulations also provide for infringement notices in relation to offences under this Act.
  - The *Electricity Act 1945* is the principal item of legislation for the electricity industry, and has supporting Regulations as follows.

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- The *Electricity Regulations 1947* cover –
    - electrical worker safety (safe work practices, other than for the ESI);
    - the supply of electricity to consumers by electricity network operators, including their obligation to inspect consumers' installations;
    - requirements for the safety approval of certain types of appliances/equipment (due to be extensively revised);
    - energy efficiency and labelling requirements for prescribed appliances/equipment; and
    - provisions for infringement notices.

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- The *Electricity (Licensing) Regulations 1991* cover –
    - standards of electrical work on consumers' installations (all types);
    - the licensing of electrical workers and contractors; and
    - notification requirements and procedural matters.
  - The *WA Electrical Requirements* issued by the Director specify electricity supply service rules and any variations to Australian Standards referenced by these regulations.

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- The *Electricity (Supply Standards and System Safety) Regulations 2001* establish safety requirements for electricity transmission and distribution systems operated by network operators like Western Power.

# **OUTLINE OF LEGISLATION CHANGES ON 1 DECEMBER 2007**

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Overall, the changes were designed to improve EnergySafety's ability to enforce regulatory requirements.

## The key changes:

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1) The powers of electricity (and gas) inspectors were consolidated into Part 3 “Inspectors” of the *Energy Coordination Act 1994*, for clarity. This involved moving the remaining inspection powers under the *Electricity Act* dealing with –

- things dangerous near electricity; and
- unsafe work practices

into new sections 18A and 18B of the *Energy Coordination Act* and making them equally applicable to gas.

## **The key changes (continued):**

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- 2) The order-making powers of electricity and gas inspectors, who are designated by the Director of Energy Safety, were expanded to make them relevant for dealing with defects in electricity or gas supply networks. These powers will only apply to *Energy Safety* inspectors.

## The key changes (continued):

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- 3) The level of maximum penalty for a typical breach of the *Energy Coordination Act 1994* has been raised from \$5,000 to \$50,000 for an individual, and from \$20,000 to \$250,000 for a corporation.
  
- 4) The level of maximum penalty for a typical breach of the *Electricity Act 1945* (and the *Gas Standards Act 1972*) has been raised from \$5,000 to \$50,000 for an individual, and from \$20,000 to \$250,000 for a corporation.

## **The key changes (continued):**

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- 5) Per *Energy Coordination Act 1994* new section 24B the Director of Energy Safety will be able to release information about the safety performance or compliance of individual energy industry participants where this is for the purpose of increasing public safety and/or increasing compliance and no other suitable means are available.



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# **PART 2 – Section 1 CHANGES TO LICENSING REQUIREMENTS**

The first section of this presentation will cover licensing issues related to the changes made to the *Electricity (Licensing) Regulations 1991*.

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- The amended regulations were gazetted (notified) on 31 December 2007 and come into force on 1 July 2008.
  - The delay is to allow both *Energy Safety*, the Electrical Licensing Board and industry to prepare for the changes.

# **PART A**

# **ELECTRICAL CONTRACTORS**

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# PENALTIES

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- The regulations were amended to increase the maximum penalties for offences against the Act and its regulations to:
  - Individual (sole trader and members of partnerships) \$50 000;
  - Corporation (incorporated under the Corporations Act e.g. Pty Ltd companies) \$250 000.

## NEW TERMS

Existing Term	New Term
Electrical mechanic	Electrician (includes electrical fitting)
Electrical fitter	Term no longer used
“A” grade licence	Electrician’s licence
“C” grade licence	Electrician’s training licence
Nominated electrical worker	Nominee

# LIABILITY INSURANCE

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- The way that insurance requirements for electrical contractors are set has changed.
- The Electrical Licensing Board will in future set the insurance required and may request an electrical contractor to provide details of the insurance policy.
- This allows more flexibility for the Board to set appropriate requirements.

# **SUSPENSION OF CONTRACTOR'S LICENCE**

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- A contractor's licence is automatically suspended if his/her prescribed insurance policy is not in effect.
- The Board may also attach conditions to a licence.

# ELECTRICAL CONTRACTOR'S LICENCE RENEWAL

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- If Energy *Safety* receives an application for licence renewal within 30 days after its expiry date the renewed licence has effect only from the date the application was received.
- Any contracting work performed between the licence expiry date and the application received date is illegal. After 30 days the licence is cancelled.

## **NOTIFICATION TO BOARD**

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- Notification to the Board of a change in the address of the principal place of business of an electrical contractor may now be conveyed by:
  - Letter;
  - Facsimile;
  - Telephone; or
  - Electronic communication (email).

## **CHANGES TO ELECTRICAL CONTRACTOR AND IN-HOUSE NOMINEES**

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- There is now a fee of \$340 for adding or changing an electrical contractor's nominee, and a fee of \$170 for in-house nominees.
- The Board will generally make an assessment of the suitability of persons being nominated, before approving them.

# **PART B**

# **ELECTRICAL WORKERS**

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# **PENALTIES**

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- The regulations were amended to increase the maximum penalties for offences by individuals to \$50,000.

# ELECTRICIAN LICENCES

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On expiry of the existing licences listed below, the new licences listed will be issued. The existing licences have effect up to their expiration date.

<b>Existing Term</b>	<b>New Term</b>
"A" grade licence (EM or dual)	Electrician's licence
"C" grade licence	Electrician's training licence

# ENDORSEMENTS

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- Existing licences endorsed “electrical fitting” will be “grandfathered”.
- Only existing holders will be able to renew such a licence. No new electrical fitting licences will be issued.
- All new electrical workers licences will be endorsed either “Electrician” (and will cover electrical fitting and installing work) or “Restricted”.
- This is in line with national changes since 2001 to the training system.

# PERMITS

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- The Board may issue an interstate or overseas applicant for an electrician's licence with:
  - a licence corresponding to that already held (assuming qualifications equivalent to electrician); or
  - a permit that is subject to conditions and restrictions, requiring the holder to become an electrician within 3 years (i.e. pass relevant assessments).

## PERMITS (cont'd)

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- Therefore if an applicant's existing qualifications are equivalent to electrical fitting only, then the permit will (subject to overseas applicants passing an examination):
  - be for a period of 3 years, to allow work for a particular employer; and
  - allow unsupervised electrical fitting work; and
  - allow supervised electrical installing work; and
  - not be renewed.

## REFRESHER TRAINING

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- If, at least 12 months before the expiry of a licence, the Board gives written notice that the licence holder is to complete successfully a course relating to electrical safety, it may refuse to renew the licence if the holder fails to comply before the licence expiry date.
- It is expected that the Board will mainly apply this globally, so that every 3 years an electrician (and REL holder) is required to attend some refresher and updating training. This will be the subject of further consultation with industry bodies.

## **APPRENTICES/TRAINEES**

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- Persons undergoing trade training must apply for and be issued with an electrician's training licence before commencing training.
- An electrician's training licence expires when the person is issued an electrician's licence or 3 months after completing the course, whichever occurs first.



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## **PART 2 – Section 2 OTHER CHANGES, NOTIFICATIONS, TECHNICAL STANDARDS**

This presentation will cover issues contained in the *Electricity (Licensing) Regulations 1991* concerning electrical installations, certificates and notifications and other miscellaneous matters.

# **CHANGES AFFECTING ELECTRICAL CONTRACTORS**

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## NEW TERMS

Existing Term	New Term
Minor work	Term no longer used (minor work is now covered by the Electrical Safety Certificate)
-	Notifiable work (i.e. all work previously not minor work)
-	Professionally qualified engineer
-	Certificate of compliance (common name: Electrical Safety Certificate)

# **ELECTRICAL SAFETY CERTIFICATE**

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- An electrical contractor must give an Electrical Safety Certificate to the person for whom any electrical work is done within 28 days of completing the work.
- An example of the certificate is contained in the Energy Bulletin. The original is for the customer and the electrical contractor must retain the copy for 5 years.
- A Minor Works Notice is no longer required for work previously defined as minor work.

# ELECTRICIAN'S AUTHORISATION FORM

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- EnergySafety will make pre-numbered books of certificates available free of charge for use by electrical contractors.
- An electrical contractor may complete the Electrical Safety Certificate or may authorise an employed electrician to complete it on his/her behalf.
- An example of an electrician's authorisation form is contained in the Energy Bulletin. The form will be available on EnergySafety's website.

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- An employed electrician authorised by an electrical contractor to complete an Electrical Safety Certificate must, if requested by the person for whom the work is being done, produce the instrument of authorisation.

## **ELECTRICAL CONTRACTOR'S LICENCE NUMBER TO BE DISPLAYED**

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- The electrical contractor's licence number must be **conspicuously** displayed in any advertisement relating to the contracting business such as, but not limited to:

letterhead;

quotation;

business card;

business directory;

Yellow Pages entry;

billboards;

newspaper advertisement;

vehicles;

Invoice;

and similar methods of advertising.

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- Conspicuous means not less than 50% of the largest lettering used in the advertisement. This “50%” guideline is a compromise to assist industry.

# EMPLOYMENT OF TRAINEES

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- The electrical contractor must:
  - ensure that a trainee holds an electrician's training licence; and
  - make himself aware of the experience and level of competence of the trainee, through the induction process.

# NOTICES

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- The preliminary notice and notice of completion may now be delivered to a network operator by:
  - Facsimile transmission;
  - Electronic communication (not email), if made available by the network operator,
  - Normal post.

Notices may be delivered to *EnergySafety*, where applicable (i.e. if no network operator exists), by normal post or facsimile only.

# ACCIDENT REPORTING

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- When an electrical contractor becomes aware of an electrical accident he must **immediately** report the accident to the relevant network operator or, if unknown, to *EnergySafety*.
- This is a change, since previously reporting to both was required.

## **OFFENCES COMMITTED BY A FIRM (PARTNERSHIP)**

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- If an electrical contracting business operates as a partnership and the business commits an offence, each member of the partnership is taken to have committed the offence.

# **CHANGES AFFECTING ELECTRICAL WORKERS**

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## **NOMINEE INDEPENDENCE**

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- A nominee (previously “nominated electrical worker”) is not required to comply with a direction concerning electrical work given to the nominee by the employer if the nominee reasonably considers that the work would not be carried out in accordance with the regulations.

## **APPRENTICES/TRAINEES**

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- An electrician supervising a trainee must ensure that before the trainee carries out any electrical work under his/her supervision, the electrician is aware of the experience and level of competence of the trainee.

## SAFETY OF TRAINEES

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- A person authorised by an electrician's training licence to undertake electrical work may refuse to carry out any electrical work that, having regard to the level of supervision being provided, the trainee reasonably considers to be electrical work that he or she is not competent to carry out or that would or would likely endanger him or her or another person. (Note: Guidelines available re type of work suitable for trainees)

# **COMPLIANCE WITH TECHNICAL STANDARDS AND RELATED DESIGN REQUIREMENTS**

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# STANDARDS TO BE COMPLIED WITH

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- Every design must comply with the:
  - Wiring Rules
  - WA Electrical Requirements
  - other Standards listed in regulation 49

as amended from time to time.

# **STANDARDS AMENDMENTS APPLICABLE FROM 1 JUNE 2008**

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- The next presentation today will cover this subject in some detail, as the Standards changes are aligned to the new Wiring Rules, which come into effect on 1 June 2008.
- That presentation will outline the new design rules, which are covered in the special edition of the Energy Bulletin and the (inserted) “Amendment N°. 5 to the WA Electrical Requirements” (also effective from 1 June 2008).

## VARIATIONS/EXEMPTIONS

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- Under the amendments to regulation 49, from 1 July 2008 the Director can vary the technical requirements for a particular consumer's installation.
- This will only be considered if there is a good reason, outlined in detail in a written application from the designer (with support from the client), warranting the safety of the proposed variation/exemption.

# ELECTRICAL INSTALLATION DESIGNERS

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- A person who designs an electrical installation is now required to ensure that:
  - It is designed to be safe and to comply with any relevant requirement referred to in regulation 49(1) [which lists documents and standards with which installations must comply]; and
  - If the person gives the design to another person who is to construct it, the design is accompanied by information about the way the electrical installation is to be installed to ensure it is safe.

# STANDARD OF ELECTRICAL WORK

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- To the extent practicable and reasonable, a person is to ensure that electrical work carried out by him/her is safe to use and has been completed to a trade finish (i.e. it complies with the regulations, all relevant Standards and the WAER).
  - applies to those holding a licence and also those not holding a licence, for exempted work.

# **ELECTRICAL WORK NOT REQUIRING A LICENCE**

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# ENGINEERS

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- A professionally qualified electrical engineer with experience in electrical installing work is not required to hold a licence to undertake:
  - Detailed inspection of an electrical installation, including switchboards and equipment;
  - Measurement of electrical parameters (such as voltage, current or energy) at any part of an installation;
  - Commissioning of, or finding faults in, an electrical installation (including any required disconnection or reconnection of electrical components and equipment).
- This merely confirms longstanding arrangements.

## **MODULAR WIRING SYSTEMS**

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- Modular wiring systems approved by the Director, or a person recognised by the Director as being competent to give such approval, may be attached to, or included in, and assembled as part of office furniture or partitioning by a person not holding a licence.
- However, the modular wiring system is required to be checked and tested for safety by an electrician before being energised for the first time after its installation.

# **PLUG AND CORD CONNECTED APPLIANCE WORK**

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- From 1 July 2008 a trained and competent person without a licence may fix a plug/socket to a flexible cord/cable that is used to connect LV electricity to an electrical appliance.
- Similarly, an appropriately trained and competent person without a licence will be able to undertake like-for-like replacement of components in an electrical appliance that is intended to be connected to electricity by a cord and plug.

## **PLUG AND CORD CONNECTED APPLIANCE WORK (cont'd)**

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- These changes put WA on the same basis as most other States, including NSW and VIC.
- Training is required under OSH laws.
- OSH regulations to be amended to remove the requirement to show the licence number on the tag, of the person who tested the cord. If tested by an electrician, the licence number may be shown on the tag.

## Which types of RELs will remain?

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- Class 1: RELs for tradespersons who have substantial electrical training as part of their apprenticeship, e.g. Refrig/AC, Instrumentation, etc.
- Class 2: Disconnect/Reconnect RELs for those persons who may need to do electrical work that is incidental to their calling e.g. plumbers, gas fitters, mechanical fitters.
- Also some special permits for the mining industry, e.g. traction equipment servicing.

# GENERAL

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## **CHANGE OF ADDRESS**

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- A change of residential address of a licence holder may now be conveyed to the Board by:
  - Letter;
  - Facsimile;
  - Telephone; or
  - Electronic communication (email).

## REPORTING DEFECTS AND ACCIDENTS

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- If it appears to an electrical worker carrying out work on an electrical installation or item of equipment that there is a defect that makes it unsafe, the electrical worker must inform the owner or occupier of the premises that the matter must be reported to the relevant network operator, or *Energy Safety* if the network operator is unknown, and must then report the matter.
- Immediately after an electrical worker becomes aware that an electrical accident has occurred at the workplace the event must be reported to the employer.



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**Questions**

**Short Break**



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# **PART 3 – WIRING RULES, WA ELECTRICAL REQUIREMENTS, HV INSTALLATIONS**

## **The presentation will cover:**

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- A brief overview of the new edition of the Wiring Rules, its application in WA and key changes
- Related changes to the WA Electrical Requirements (WAER)
- Proposed new AS 2067: High Voltage Installations

Questions will preferably be taken at the end.

# SECTION A - OVERVIEW OF THE NEW WIRING RULES

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- New edition AS/NZS 3000:2007 Wiring Rules published 12 November 2007. Will take effect on 1 June 2008.
- Electrical installing work that started before 1 June 2008 will be inspected for compliance with 2000 or 2007 editions of the Wiring Rules, regardless of the completion date of the work.
- The commencement date will be taken to be the date on the Preliminary Notice received by the network operator, or *EnergySafety* as appropriate.

## **SECTION A - OVERVIEW OF THE NEW WIRING RULES (cont'd)**

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- Electrical installing work that commences after 1 June 2008 will be inspected for compliance with the new 2007 edition of the Wiring Rules.
- Designs in progress should be reviewed and amended to ensure compliance with the 2007 edition of the Wiring Rules.
- Completed designs subject to tender and contract finalisation should also be reviewed and amended if it is likely that a Preliminary Notice will not be submitted before 1 June 2008.

## **New Wiring Rules consist of:**

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- One Standard in two parts
- Part 1 – Fundamental Design Principles
- Part 2 - Deemed to Comply Design Solutions
  - Installation practices that achieve certainty of compliance with Part 1. Also provides guidance on installation of equipment (not required by the Standard).
  - restores missing key information ex 1991 edition and provides practicable and cost effective methods for achieving compliance.

# **New Wiring Rules – Part 1, Section 1 Means of Compliance**

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- Compliance with the applicable sections of Part 2 is deemed to meet Part 1.
- Domestic installations that meet all requirements of AS/NZS 3018 Electrical Installations – Domestic installations are also deemed to meet Part 1.

# **New Wiring Rules – Part 1, Section 1 Means of Compliance (cont'd)**

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- Alterations, additions and repairs
  - Every alteration of, or addition to, an existing electrical installation must comply with 2007 edition.
  - Alterations or additions to an existing electrical installation shall not cause any portion of the original electrical installation, or electrical equipment connected thereto, to —
    - a) carry currents or sustain voltages in excess of those permitted by this Standard; or
    - b) be used in any manner that is not in accordance with this Standard.

## **New Wiring Rules – Part 1, Section 1 Means of Compliance (cont'd)**

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- Repairs to existing electrical installations or parts thereof may be made using methods that were acceptable when that part of the electrical installation was originally installed, provided that the methods satisfy the fundamental safety principles of Part 1 of this Standard.
- Compliance by specific design and installation (Clause 1.9.4)
  - Electrical installations or portions of electrical installations that, due to their unusual requirements, application or intended use, cannot meet Part 2 of this Standard, may use a specific design and installation method as detailed below,

## **New Wiring Rules – Part 1, Section 1 Means of Compliance (cont'd)**

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- Such installations may be deemed suitable if they:
  - a) satisfy Part 1 “Fundamental Design Principles” of this Standard;
  - b) will result in a degree of safety from physical injury, fire and electric shock not less than that which, in other circumstances, would be achieved by compliance with the particular requirements of this Standard; and
  - c) satisfy the other requirements of this clause.
  
- Expected that there will not be many installations designed to Part 1. Particular rules apply in WA, per WAER Amendment N<sup>o</sup>. 5 (covered later).

## **New Wiring Rules – Part 2, Section 2**

### **General arrangement, control and protection**

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- Consumers mains – Short circuit protection need not be provided where:
  - Overload protection is provided at the main switchboard; and
  - The consumers mains are constructed to minimise the risk of short circuit in accordance with Clause 3.9.7.1.2 (known as unprotected consumers mains).

## **New Wiring Rules – Part 2, Section 2 General arrangement, control and protection (cont'd)**

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- Clause 3.9.7.1.2 requires such mains to be insulated and sheathed cables (single core) enclosed in heavy duty insulating conduit from the point of supply to the main switchboard i.e. includes inside the cavity wall.
- In WA insulated and sheathed (multicore) consumers mains are permissible, without enclosure in heavy duty conduit, when installed in the cavity of double-brick walls. This exemption is contained in the amended Section 12 of the WAER.

## **New Wiring Rules – Part 2, Section 2 General arrangement, control and protection (cont'd)**

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- RCD – Supplementary protection
- Type “S” (100 to 300mA) RCDs to minimise initiation of fire – not a requirement of standard but guidance provided for their installation.
- Where supplementary protection of final sub-circuits is required in accordance with Clause 2.6.3, the final sub-circuits shall be arranged as follows:
  - Not more than three final sub-circuits shall be protected by any one RCD;
  - Where –
    - a) the number of RCDs installed exceeds one; and
    - b) more than one lighting circuit is installed, the lighting circuits shall be distributed between RCDs.
  - If more than one final subcircuit for socket outlets and lighting points then two RCDs are required.

## **New Wiring Rules – Part 2, Section 2 General arrangement, control and protection (cont'd)**

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- RCD – Supplementary protection - Residential electrical installations
- Supplementary protection by RCDs with a maximum rated residual current of 30 mA shall be provided for final subcircuits supplying:
  - one or more socket-outlets, or
  - lighting points, or
  - directly connected hand held electrical equipment (e.g. directly connected hair dryers or tools)
- RCD required to be fitted to protect under tile, carpet or in floor heating systems

## **New Wiring Rules – Part 2, Section 2 General arrangement, control and protection (cont'd)**

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- RCD – Supplementary protection - Other electrical installations
- Supplementary protection by RCDs with a maximum rated residual current of 30 mA shall be provided for final sub-circuits supplying –
  - socket-outlets having a rated current not exceeding 20A
  - one or more lighting points not exceeding 20A
  - directly connected hand held electrical equipment (e.g. hair dryers or tools).
- Exemption: socket outlets may be provided with an RCD at each outlet and not at the origin of the final sub circuit.

## **New Wiring Rules – Part 2, Section 2 General arrangement, control and protection (cont'd)**

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- RCD – Supplementary protection - Patient Treatment Areas
- Medical electrical equipment used in patient treatment areas (e.g. home dialysis) shall be installed in accordance with AS/NZS 3003.
- Socket-outlets used for this purpose shall be supplied by a dedicated circuit without RCD protection at the switchboard and provided with enhanced protection by a fixed setting RCD with a maximum rated residual current of 10 mA located such that it can be reset by the patient whilst under treatment.
- Discrimination between 10mA and 30mA RCDs is not possible.

## **New Wiring Rules – Part 2, Section 2 General arrangement, control and protection (cont'd)**

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- RCD – Supplementary protection – Alterations, additions and repairs
- Socket outlets added to existing circuit require RCD protection.
- No longer Exempt:
  - socket-outlets added to a final sub-circuit, where the existing final sub-circuit is not RCD protected i.e. RCD required for new socket outlet/s.
- Exemptions:
  - lighting points to a final sub-circuit, provided that the existing final sub-circuit is not RCD protected.
  - replacement of socket outlets (including single to a double socket outlet)

## **New Wiring Rules – Part 2, Section 3**

### **Selection and installation of Wiring Systems**

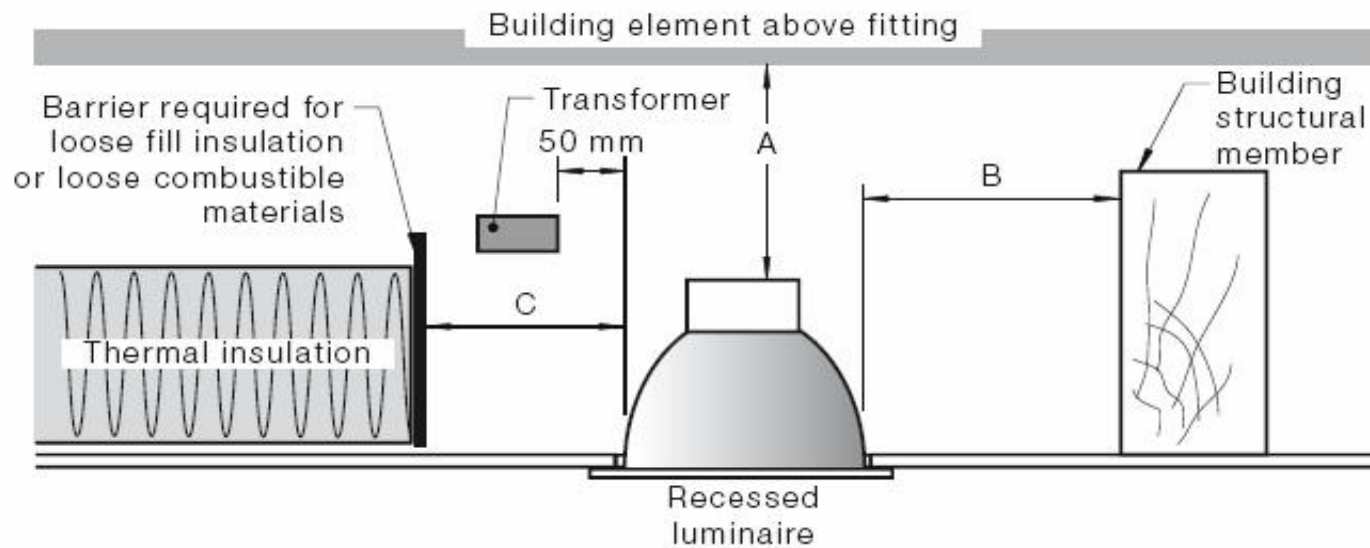
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- Suspended ceilings
- The following conditions apply to the installation of wiring systems in suspended ceilings:
  - Wiring systems shall not be supported by removable ceiling tiles or planks;
  - In accordance with AS/NZS 2785, wiring systems shall not be supported by ceiling hangers or struts.
- Exception: Wiring systems may be supported by ceiling hangers or struts specifically designed for the purpose.

## **New Wiring Rules – Part 2, Section 4 Selection and installation of appliances and accessories**

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- Clearances around down lights - lamp can be installed to manufacturers instructions. If no information provided then clearances shown in the following diagram must be maintained.



Dimension	Incandescent lamp	Halogen lamp
A – clearance above luminaire	50 mm	200 mm
B - side clearance to structural member	100 mm	200 mm
C – clearance to thermal insulation	50 mm	200 mm
D – clearance to supply transformer	50 mm	

## **New Wiring Rules – Part 2, Section 5 Earthing arrangements and earthing conductors**

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- Clause 5.6.2.5 requires the conducting metal reinforcing mesh within concrete floors and walls forming part of a shower recess or bathroom to be bonded to the earthing system of the electrical installation.
- In WA this requirement is optional. This variation is contained in the amended Section 12 of the WAER.

## **SECTION B – CHANGES TO WA ELECTRICAL REQUIREMENTS**

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- The new edition of the WAER will be released around 1 June 2008 and comes into effect on 1 July 2008.

Amendment N<sup>o</sup>. 5 (applicable from 1 June, issued in March 2008) to the current edition of the WAER substitutes an entirely new replacement Section 12 and has been released early to provide advance notice to industry.

## **SECTION B – CHANGES TO WA ELECTRICAL REQUIREMENTS (cont'd)**

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- Sections 1-12 are mandatory under regulation 49 of the *Electricity (Licensing) Regulations 1991*.
- Section 13 contains the connection requirements of individual network operators.
- Some network operators are developing web based information to support the WAER.

## MAIN CHANGES

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- Detailed criteria have been included that, if satisfied, will allow multiple points of supply to an individual lot. The concept of “zones” has been developed to provide for this type of arrangement.
- If multiple points of supply are provided then a site electricity safety management plan must be prepared, approved by the network operator and held on site by the occupier. An electrical contractor must read the safety management plan before any electrical work is commenced.

## **MAIN CHANGES (cont'd)**

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- The requirements relating to HV installations have been expanded.
- For domestic installations the service protective device must be an HRC fuse with a maximum let through fault current capacity of 6kA.

## **WAER SECTION 12 – LOCAL REQUIREMENTS**

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- Under regulation 49 the WAER may contain matters additional to or variations from the Wiring Rules and other Standards, applicable in WA. These are contained in Section 12.
- The following slides outline the key changes to Section 12, applicable from 1 June 2008, as detailed in Amendment N<sup>o</sup>. 5 to the WAER (contained in the Energy Bulletin handout).

# DESIGNS TO PART 1 OF THE WIRING RULES

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- Part 1 of the Wiring Rules must not be used for the electrical design of:
  - Domestic installations
  - Construction and demolition sites
  - Medical treatment areas
  - Relocatable installations and the site installations that supply them
  - Marinas and pleasure craft
  - Shows and carnivals
- The requirements for designers and verifiers of a Part 1 electrical installation design are contained in Amendment N<sup>o</sup>. 5 to the WAER.

# DESIGNS TO PART 1 OF THE WIRING RULES (cont'd)

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- Qualifications of designers and verifiers.
  - Licensed electrician with minimum 10 years total experience (and not less than 5 years in design) in non-domestic electrical installations; or
  - Holder of a TAFE Advanced Diploma in Electrical Engineering (or equivalent) and at least 5 years experience in the design of non-domestic electrical installations; or
  - Professional Electrical Engineers (Power) with at least 5 years experience in the design of non-domestic electrical installations.

## **DESIGNS TO PART 1 OF THE WIRING RULES (cont'd)**

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- A design verifier must be independent of the designer (but can be in same company).
- A Design and Verification Certificate, a template of which is contained in the WAER handout, must accompany a design to Part 1 of the Wiring Rules.
- Electrical contractors must declare, on the Notice of Completion, that the electrical installing work has been installed to meet the requirements of Part 1 or Part 2 of the Wiring Rules, as applicable.

## **CABLE RATINGS**

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- Cables installed in the roof space of domestic installations within 100mm of the ceiling are deemed to be either partially or completely surrounded by thermal insulation (whether such insulation is installed or not) for the purpose of calculating current carrying capacity.

## **CABLE RATINGS (cont'd)**

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- If the method of installation allows free circulation of air around the cables (e.g. an insulation free space of not less than 50mm x 100mm) they are not considered to be surrounded by thermal insulation.
- A length of cable not exceeding 150mm passing through bulk insulation (e.g. to a lighting point) is not considered as being surrounded by insulation.

# CONSUMERS MAINS IN WALL CAVITIES

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- Insulated and sheathed (multicore) consumers mains are permissible without enclosure in heavy duty conduit when installed in the cavity of double brick walls in WA (Wiring Rules Clause 3.9.7.1.2)

## **EQUI-POTENTIAL BONDING IN SHOWER RECESSES AND BATHROOMS**

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- Equi-potential bonding of the conducting metal reinforcing mesh within concrete floors and walls forming part of a shower recess or bathroom is not required (Wiring Rules Clause 5.6.2.5). That is, this arrangement is optional in WA.

## APPLICABLE STANDARDS

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- A list of applicable Standards for electrical work is now included in Section 12.
- The list of Standards contained in regulation 49(1) will be deleted when the regulations are next amended. The Standards cover:
  - Switchgear Assemblies and Ancillary Equipment
  - Electrical Installations – Re-locatable Premises (including caravans and tents)
  - Electrical Installations – shows and carnivals
  - Electrical Installations – Patient Treatment Areas of Hospitals and Medical, Dental Practices and Dialysing Locations
  - Electrical Installations – Marinas and pleasure Craft at low voltage
  - Electrical Installations – Selection of Cables
  - Electrical Installations – Generating Sets
  - Electrical Apparatus for Explosive Gas Atmospheres
  - Electrical Apparatus for use in the presence of Combustible Dust

## **SECTION C – PROPOSED NEW AS 2067: HIGH VOLTAGE INSTALLATIONS**

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- Revision of AS 2067:1984 Switchgear assemblies and ancillary equipment for alternating voltages above 1kV.
- Released by Standards Australia for public comment on 25 June 2007 (Comment period closed on 20 August 2007).
- The new edition of AS 2067 will be very different to the existing and will cover all types of substations and all other requirements for consumers' high voltage installations.

## **SECTION C – PROPOSED NEW AS 2067: HIGH VOLTAGE INSTALLATIONS (cont'd)**

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- Revised Standard will be issued in late 2008 as AS 2067:2008 High Voltage Installations
- Standard based on IEC 61936-1:2002 Power Installations exceeding 1kV ac – Part 1: Common rules
- The Standard will cover HV installations of:
  - power stations
  - electricity network substations
  - consumers (i.e. the entire HV installation)

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- Section 7.6 – High Voltage Electrical Installations in AS/NZS 3000:2007 Wiring Rules (formerly Section 7.8 in the 2000 edition) is now located in an Appendix K of AS/NZS 3000.
  - Appendix K will eventually be replaced by the revised AS 2067 once it is published. Appendix K will then automatically expire.
  - Section 7.6 of the new Wiring Rules refers to the revised AS 2067 so that all matters pertaining to high voltage installations are in a single Standard.



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## **PART 4 – CODE OF PRACTICE: SAFE ELECTRICAL WORK**

An initiative from the Office of *EnergySafety*, to improve the safety of electricians working on all types of consumers' installations.

Note: This Code does not apply to electricity supply industry related work.

## **BACKGROUND**

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- Why? Because too many electricians are killed or injured by electric shock or flash burns.
- Main reasons? Competitive pressures between contractors and lazy work practices, result in work being done “live” at LV.

# THE RATIONALE

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- 'Live' electrical work at LV is dangerous and rarely justified.
- Only necessary for some parts of testing, fault-finding and commissioning.
- Discretionary 'live' LV work to be banned.

# THE CODE OF PRACTICE

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- Issued under section 33AA of the *Electricity Act 1945*.
- Although written in obligatory terms, is a guideline and not mandatory.
- The Code is open for industry comment, but can be used now.

## THE CODE OF PRACTICE (cont'd)

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- Failure to comply could expose employers and clients of electrical contractors to liability under OSH legislation (WorkSafe).
- Energy Safety plans to later convert the Code into regulations (then mandatory).

## WHAT DOES THE CODE REQUIRE?

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- Justification for discretionary live work:
  - Will there be greater danger to human life if the electricity is switched off than the life risk incurred by electricians working live?
  - If yes, then live work may proceed in accordance with Code of Practice.
- This will be very rare.

## **WHAT DOES THE CODE REQUIRE? (cont'd)**

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- Loss of production, increased costs and inconvenience are not acceptable as justification for live work.
- After all, how does the installation cope with normal supply interruptions?
- Proper planning is essential to avoid live work (e.g. take advantage of planned annual maintenance shutdowns or use barriers, etc. to make job safe).

## **WHAT DOES THE CODE REQUIRE? (cont'd)**

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- Client must provide written justification.
- Formal written risk assessment is mandatory.
- Both electrical employer (e.g. electrical contractor) and employee electricians must agree the work can be done safely.
- Live work not permitted in any domestic installations.

## **IF LV LIVE WORK IS JUSTIFIED:**

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- Written safe work procedure mandatory and risk based.
- Prospective fault current above 10,000A – work plan must be independently assessed by competent person and safety observer must be present.
- Less than 10,000A – independent safety observer not mandatory but all other steps remain.
- Safety assessors must meet experience and qualification requirements set out in Code.

# SUMMARY

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- Code also includes template forms for work plans, client sign-off, electrical employer sign-off, electrical worker sign-off and independent safety assessor sign-off.
- Code also includes guidance material for handing to clients, to inform them that live work may be done only in rare circumstances, under strict controls.

# CONCLUSION

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- All electrical contractors are expected to follow the Code.
- This means there is no longer:
  - A competitive advantage for working live; or
  - An excuse for short cuts or lazy work practices.
- The Code can be downloaded at [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au)



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# **PART 5 – OVERVIEW OF WA'S ELECTRICAL SAFETY OUTCOMES**

## **ACCIDENT STATISTICS (all persons)**

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<b>Year</b>	<b>2002/03</b>	<b>2003/04</b>	<b>2004/05</b>	<b>2005/06</b>	<b>2006/07</b>
<b>Fatal Accidents</b>	7	3	4	3	5
<b>All Accidents</b>	37	26	43	38	18
<b>Shocks</b>	1023	984	998	1280	928

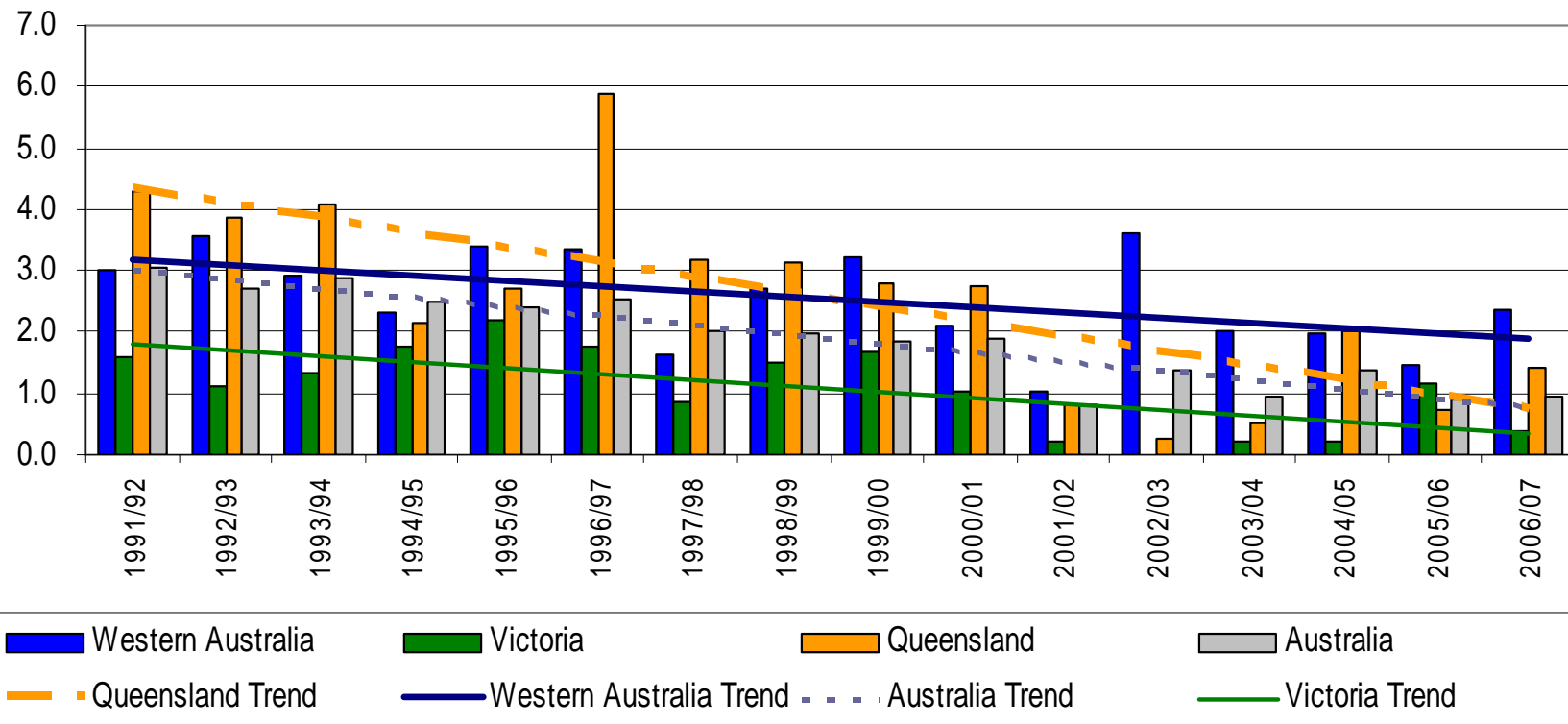
## **FATALITIES SUMMARY (2006/07)**

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- A man contacted the frame of a hydraulic machine. The frame was live due to an A-E transposition at the 3 phase plug.
- An electrician contacted a live conductor at a joint in a roof space.
- A boy dismantled a pedestal fan and touched the live parts of the controller.
- A man contacted the output terminals of a welder.
- A man, whilst carrying out vegetation control work, contacted a 22kV power line.

# FATALITIES COMPARISON 2006/07

CHART A: ELECTRICAL FATALITIES PER MILLION POPULATION



## **ELECTRICAL FATALITIES 1980 to 30 JUNE 2007**

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- 144 deaths over this period - All were preventable

<b>Nº.</b>	<b>Main Area</b>	<b>Cause</b>
41	Powerlines	Vegetation pruning, lineman (work practice) crane, etc.
39	Appliances, cords	A-E transposed, no earth, etc.
22	Unlicenced work	Unsafe work practice
19	Electricians (work practices)	Failing to isolate or barrier off resulting in contact with live parts, etc.
4	Welding	Touching electrode
19	Other	Defective installations, etc.

# **ELECTRICIAN ACCIDENT STATISTICS 2000 – 2007**

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- 78 incidents (including fatalities)
- Summary of causes:
  - 48 - Incorrect work practices causing a flashover
  - 12 - Inadvertent contact with live parts
  - 11 - Failure to isolate
  - 9 - Defective or damaged wiring
- All were preventable. Don't work 'live'!

# **SUMMARY OF PROSECUTIONS**

## **2000 to March 2008**

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- **General**
  - 2 x s.20 ECA - Failure to answer an Inspector's questions
  - 10 x Reg 63 - Failure to report an accident
  - 5 x Reg 54 - Submitting a notice of completion without authorisation
- **Unlicensed**
  - 101 x Reg 19 - No EW Licence
  - 48 x Reg 33 - No EC licence

# **SUMMARY OF PROSECUTIONS 2000 to March 2008 (cont'd)**

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- **Electrical Contractors**
  - 101 x Reg 52 - Non submission of Notice of Completion
  - 33 x Reg 52(3) - Submitting Notice of Completion when work is not complete
  - 10 x Reg 45 - No licence number with advertisement.
  - 5 x Reg 51 - Non submission of preliminary notices
  
- **Electrical Workers**
  - 186 x Reg 49 - Substandard work
  - 9 x Reg 50 - Inadequate supervision
  - 17 x Reg 50A - Unsafe work

# SUMMARY OF INFRINGEMENT NOTICES

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- 27 x Reg 45 – No licence number with advertisement
- 1 x Reg 52 - Non submission of Notice of Completion
- In future more infringement notices are expected to be issued, rather than prosecutions. The \$ level of these will also increase.

## **ELECTRICAL LICENSING BOARD COMPETENCY ASSESSMENTS**

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- 23 electrical workers were referred to the ELB for competency assessments since August 2007.
  - 9 did not sit the assessment – result licence suspended
  - 5 did not pass the assessment
  - remainder in process of assessment
- None have passed the assessment.

# QUESTIONS

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