

energy

Bulletin

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New Guidelines for the Safe Management of High Voltage Electrical Installations now published

The new WA Electrical Requirements (WAER) makes reference to a new EnergySafety publication “Guidelines for the Safe Management of High Voltage Electrical Installations”. These guidelines were published on 1 May 2014.

Purpose of the Guidelines

Historically, technical requirements for HV electrical installations have focussed on design and construction standards necessary to satisfy network connection requirements. However, outside general occupational safety and health obligations, there are currently few specific technical requirements for the ongoing safe operation and maintenance of HV installations, and the accountability for regulatory oversight is uncertain.

I believe that this could have contributed to the unacceptable level of risk associated with some 700 (approximate) HV installations across the state. The new guidelines are designed to provide owners and operators with a reasonable benchmark for what constitutes “good electricity industry practice” for the ongoing safe management of such installations.

These guidelines complement the general requirements under the Occupational Safety & Health Act and Regulations for creating and maintaining a safe workplace.

Accountabilities of Parties

In terms of accountability for HV electrical installations, the following principles apply:

- Installation designers, as agents for the owner/operator, are required by the WAER to certify that new electrical installations comply with all technical requirements (including safety).
- Network operators assess whether each new electrical installation meets all technical/safety requirements, to their satisfaction, prior to network connection.
- Under the current installation inspection regime, network operators have no obligation to monitor the condition of electrical installations post connection, except where subsequent modifications are formally declared via the installation inspection process.
- The owners/operators of electrical installations are responsible for the ongoing safety of their installation once the network connection has been made. This obligation lies in occupational safety and health legislation, with compliance oversight by WorkSafe.

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EnergySafety



Government of Western Australia
Department of Commerce

EnergySafety
303 Sevenoaks Street
Cannington
Western Australia 6107

Telephone: (08) 9422 5200
Fax: (08) 9422 5244
Email: energysafety@commerce.wa.gov.au
Internet: www.energysafety.wa.gov.au

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Guidelines Development

EnergySafety developed these new guidelines as part of the review of the WAER. Input was sought and received from industry, including network operators, the National Electrical and Communication Association (NECA), the Master Electricians Association (MEA), consulting engineers, WorkSafe and electrical training service providers.

Application of the Guidelines

Application of these guidelines by owners and operators of HV electrical installations is not mandatory at this stage.

However, EnergySafety strongly recommends adopting the safety management practices set out in the guidelines to effectively manage the inherent risks associated with HV electrical installations.

Further Information

A copy of the "Guidelines for the Safe Management of High Voltage Electrical Installations" may be obtained by downloading from EnergySafety's website at: www.energysafety.wa.gov.au



KEN BOWRON
DIRECTOR OF ENERGY SAFETY

New website

EnergySafety, as part of Department of Commerce's customer focused service delivery program, will launch our new website in early June 2014.

The new website is designed to improve the user experience and is built for the mobile workforce, giving users optimal viewing experience over a wide range of mobile devices as well as desktop systems.

The website will be continuously improved to provide a greater number of online business tools, providing clients with a self-service facility and more online transactions.

The website address remains the same www.energysafety.wa.gov.au however all links and bookmarks to the old website will no longer be available and will need to be updated.

Phone number changes effective 1 July 2014

With other Department of Commerce agencies moving to Cannington later this year, a centralised phone system will be installed. This new system will result in a change to phone numbers for EnergySafety from 1 July 2014. Please update your records accordingly.

General enquiries

Phone 6251 1900

Fax 6251 1901

Electrical and Gas Licensing

Phone 6251 2000

Fax 6251 1902

The 24 hour Accident or incident reporting line remains the same.

1800 678 198

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Alternative formats of this publication may be available to meet the needs of people with disabilities.

For enquiries:

Editor: Cathy Gildersleeve

Phone: 08 9422 5208

Fax: 08 9422 5244

Email: cgildersleeve@commerce.wa.gov.au

Internet: www.energysafety.wa.gov.au

electrical

focus

Two electric shocks – unsafe installation reconnected. Rio Tinto fined \$35,000

On 5 February 2014, network operator Hamersley Iron Pty Ltd T/As Rio Tinto appeared in Perth Magistrate's Court where it pleaded guilty to failing to connect the neutral conductors before reconnecting the electricity supply to a residential premise in Paraburdoo. This caused the installation to become unsafe.

The issue first arose when a work crew responded to an electricity supply problem at the installation and found a 415 volt ac white-phase 63 ampere fuse located inside a connection pillar near the premises had operated. The fuse holder had been damaged due to a loose high resistance connection and resultant heat.

The work crew isolated the electricity supply to the connection pillar and replaced the damaged fuse holder. On completion of their checking and testing, the work crew left the premises and connected the installation to the electricity supply. They failed to reconnect the consumers' mains neutral conductor at the neutral link, which left the installation in an unsafe and dangerous condition.

This defect was only identified when both property owners received electric shocks from a shower rose and water taps.

A Rio Tinto inspector, while carrying out an investigation into the electric shocks, measured 11.3 volts between the water waste pipe and an independent earth electrode and a current flow of 160 mA. He also found the consumers' mains neutral conductor had not been connected to the neutral link inside the connection pillar.

The Magistrate convicted and fined the network operator \$35,000 with court costs of \$575.00.

Following this incident, Rio Tinto created a program to provide service connection training for all their utility electricians performing service connections. The company also developed a standard work procedure for service connection work.

Ignorance or negligence – too many unlicensed apprentices

Electrical contractors and employers are reminded to inform their apprentices of the requirement to apply for their Electrician's Licence on completion of their apprenticeship.

The Electrician's Training Licence, issued to apprentices at the commencement of their apprenticeship, is only valid for three months from the time the apprenticeship is completed.

During this transition period, it is essential that all apprentices submit an "Application for an Electrician's Licence on Completion of an Apprenticeship in Western Australia" (download from our website at www.energysafety.com.au).

EnergySafety is investigating several instances where apprentices failed to apply for their electrician's licence within the required time.

Recent investigations have included the following:

- An apprentice had completed his apprenticeship but had not applied for his Restricted Electrical Worker's licence until six months after completing his apprenticeship.
- An apprentice had commenced his apprenticeship in 2002 and was issued with his Electrician's Training Licence, which had an expiry date of 7 January 2006. It wasn't until 2011, that the apprentice applied for his electrician's licence, even though his trade certificate showed a completion date of 2006.
- An apprentice had only applied for his Electrician's Training Licence two years after commencing his apprenticeship.
- An apprentice was found not to have applied for his Electrician's Training Licence for the duration of his apprenticeship, as he had not been informed by his employer of the licensing requirements.

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The reasons supplied by the apprentices as to why they had not submitted their licence applications within the required time frames included assuming their employer or lecturer at TAFE was going to make the arrangements for the licence, or, downright complacency.

In one particular investigation, an electrical contractor had employed two first-year electrical apprentices who did not hold their Electrician's Training Licences. One of the apprentices was not asked to show any licence details when he commenced employment with the electrical contractor while the other was unsure whether he required a licence or not.

The electrical contractor was of the belief that the licence for one of the apprentices, had already been organised by Apprenticentre Western Australia. As for the other apprentice, the contractor had asked him to produce his licence but failed to follow up the request.

While both apprentices were working under supervision at the same domestic installation, one received an electric shock from a lighting circuit while the other received a shock from an unterminated "live" cable while working in the roof space of the house.

It was evident that the contractor was unaware of the supervisory requirements for apprentices.

As both apprentices had not undertaken the "Apprentice Safety Assessment Test", they were unaware of the basic safe electrical practices which could have prevented these incidents.

To obtain an Electrician's Training Licence, an "Application for an Electrician's Training Licence" is to be submitted to EnergySafety. The application form is to be signed by the apprentice and the authorised representative of the employer or a representative from the Group Training Scheme or Registered Training Organisation.

Before the application is submitted, the employer must provide the apprentice with a copy of the "Apprentice Safety Assessment Guidelines" prior to being interviewed by the employer. This is to assess the apprentice's awareness of their own and others' safety responsibilities (ie apparel, personal safety equipment and supervision requirements) and to ensure they have a sound knowledge of rescue and resuscitation procedures.

The employer must supervise and assess the apprentice with the "Apprentice Safety Assessment Test" or alternatively, arrange for an independent assessor to administer the test. The assessor must be an electrician licenced to carry out the apprentice's identified work.

A score of at least 80% is required for the assessor to inform the Electrical Licensing Board that the apprentice's trade safety knowledge justifies issuing an Electrician's Training Licence.

This completed test is not to be submitted to the Licensing Office but retained by the apprentice for reference purposes.

Along with the "Application for an Electrician's Training Licence", the apprentice must also submit a completed copy of the "Apprentice Safety Assessment Report" to the Licensing Office.

This report contains a declaration from the employer that the apprentice has been instructed, interviewed and assessed in accordance with the "Apprentice Safety Assessment Guidelines", has a satisfactory knowledge and understanding of the material provided in the Guidelines and is aware of their obligation to apply their knowledge of the Guidelines in the workplace.

The report also includes a declaration from the apprentice that they have been provided with a copy of the Guidelines and have been assessed accordingly.

Once the Electrician's Training Licence has been issued to an apprentice, a copy is sent to the electrical contractor/employer. At this point, the apprentice's licence details must be entered in the employer's register of electrical workers. Details to be recorded include the apprentice's name, address, licence number, licence type, expiry date of the licence and the date of the apprentice's employment.

Apprentice records must be kept for a period of two years after the apprentice has ceased employment with the company.

Carrying out electrical work without the required licence or permit, is a breach of the Electricity (Licensing) Regulations 1991, Regulation 19(1).

Employers must ensure that an apprentice holds an Electrician's Training Licence before he or she performs any supervised electrical work.

Employers found to have an apprentice carrying out electrical work while not holding an Electrician's Training Licence will be prosecuted.

All you need to know about Electrical Safety Certificates

EnergySafety is still receiving reports from too many customers who have not received a copy of an Electrical Safety Certificate from an electrical contractor for the electrical installing work carried out at their premise. The following information has been prepared to assist electrical contractors:

Q: What is the purpose of an Electrical Safety Certificate?

A: An Electrical Safety Certificate, is a guarantee to the installation owner/occupier that the electrical installing work carried out by an electrical contractor, is completed, checked and tested and at the time of testing met the requirements of the Electricity (Licensing) Regulations 1991.

Q: How many days after an installation has been completed, must an Electrical Safety Certificate be provided to a customer?

A: An Electrical Safety Certificate is required to be provided to the person requesting the work to be carried out within twenty eight days after the electrical installing work has been completed.

Q: When is an Electrical Safety Certificate not required to be provided to a customer?

A: An Electrical Safety Certificate does not have to be provided for the following types of electrical work:

- maintenance work;
- in-house electrical installing work carried out under an in-house electrical installing licence;

- electrical installing work carried out at a mine site, if the electrical contractor makes a record of the work in a form approved by the Director (ie mine site Electrical Log Book); or
- electrical installing work that is associated with the installation of a temporary builder's supply.

Q: What is maintenance work?

A: Maintenance work is defined in the Electricity (Licensing) Regulations 1991 as repairing defective electrical equipment or replacing electrical equipment with electrical equipment having equal or substantially similar engineering specification (ie like-for-like).

Examples include:

- Replacing a bayonet cap lighting fitting with another bayonet lighting fitting.
- Replacing a socket outlet for another socket of similar specification.
- Replacing a light switch with another light switch.
- Replacement of a hot water system of similar specification.
- Replacing a single oven with another single oven.
- The disconnection and reconnection of motors and motor starters, including the replacement of motors of similar specification.

Q: Why do I need to provide an Electrical Safety Certificate to my customers?

A: It provides proof to the customer that the work has been carried out by an electrical contractor. Failing to provide this Certificate to a customer, is an offence. It also suggests the person who carried out the electrical work, is not licensed.

Q: For how long must I keep copies of Electrical Safety Certificates that I have issued?

A: Certificates are to be retained by the electrical contractor for a period of five years after the electrical work has been completed.

Q: Can my employees/electricians complete Electrical Safety Certificates on my behalf?

A: Electrical contractors can authorise an employee electrician to complete and sign Electrical Safety Certificates on their behalf. An Electrical Safety Certificate "Authorisation Form", which can be downloaded from EnergySafety's website at www.energysafety.wa.gov.au, must firstly be completed by the electrical contractor.

The electrician authorised by the form to complete Electrical Safety Certificates if requested to do so, must then produce this form to the person for whom electrical installing work is carried out, if requested to do so.

Q: When is an Electrical Safety Certificate considered to have been completed?

A: As per Regulation 52B(4), an Electrical Safety Certificate is only considered to have been completed if the following criteria have been met:

- it has been completed by the relevant electrical contractor or, if subregulation (5) applies, by the electrical worker;
- it is given an identifying number that is not given to any other electrical safety certificate given by or on behalf of the electrical contractor;
- it states the number of the electrical contractor's licence and, if subregulation (5) applies, the number of the electrical worker's licence or permit;

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- it describes clearly and accurately the electrical installing work to which it applies and states the address where that work was carried out and the date on which that work was completed;
- it certifies that the electrical installing work to which it applies has been checked and tested and is safe and complies with these regulations; and
- it is signed or executed by the electrical contractor or, if subregulation (5) applies, it is signed by the electrical worker.

Q: What should I do if I become aware that a customer has not received an Electrical Safety Certificate?

A: Instances when Electrical Safety Certificates have not been received, should immediately be reported to the relevant network operator for investigation.

Q: What happens if the wrong information is included in the Electrical Safety Certificate?

A: It is an offence to provide an Electrical Safety Certificate to a customer if you know that the information included in it, is false or misleading.

Q: Whom do I contact if I require more books of Electrical Safety Certificates?

A: If you require more Electrical Safety Certificates, please contact our Licensing Office on 9422 5282 or via email energylicensing@commerce.wa.gov.au.

Clarification on warning signs for recessed luminaires

EnergySafety received a query from an electrician asking for clarification on warning signs.

The electrician was carrying out an installation in an office which predominantly had false ceiling tiles. The ceiling was accessible from every tile and there was no designated access panel. The electrician asked whether he was expected to place the required signage above each tile when installing recessed luminaires.

AS/NZS 3000: 2007 "Wiring Rules", Clause 4.5.2.3.2 stipulates that where recessed luminaires are installed in an accessible roof space, a permanent and legible warning sign shall be installed in the roof space adjacent to the access panel, in a visible position for any person entering the roof space.

This warning sign must meet the following criteria:

- Have a minimum lettering size of 10mm
- Comply with AS 1319: 1994 "Safety signs for the occupational environment"
- Contain the words detailed below in Figure 4.8



Figure 4.8 Warning sign to be installed in accessible roof spaces containing recessed luminaires

In an office environment with false

ceiling tiles, it is not necessary or practical to install these warning signs for every tile. The quantity and positioning of the sign should ensure that there is a warning sign visible no more than four metres away, from every ceiling tile.

Contractor fined \$20,000 for failing to submit a Notice

An electrical contractor received a fine of \$20,000 and court costs of \$1,786.15 for failing to submit a Notice of Completion to Western Power for an installation in Mirrabrooka.

The electrical contractor had been engaged to carry out the electrical installing work associated with a new domestic premise.

The property owner contacted Western Power after he had discovered "live" electrical cables in the roof space.

A Western Power inspector carried out an inspection of the roof space and found the cable joints for the lighting circuit cable were not enclosed in a junction box, which left the installation in an unsafe and dangerous condition.

Investigation by Western Power found that one of the contractor's electrician's had terminated the cable joints in the roof space when the cables were first installed at the "tube out" and wiring stage.

Another electrician from the same contractor, carrying out the "fitting off" stage of the installation, then checked and tested the completed installation. The electrician's checking and testing sheet did not mention any identified defects.

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If the electrician had carried out adequate visual testing of the installation, he would have detected the unenclosed cable joints, which is a serious defect.

Electrical contractors must ensure they carry out adequate visual testing of completed installations to verify the work complies with Section 8 – Verification of AS/NZS 3000:2007 “Wiring Rules” and AS/NZS 3017: 2007 “Electrical installations – Verification guidelines”.

A visual inspection is to be carried out before or in conjunction with the mandatory testing (ie continuity of the earthing system, insulation resistance, polarity, correct circuit connections, verification of impedance and the operation of RCDs). Where practicable, the testing should be carried out before an installation is energised.

Where visual testing cannot be carried out before an installation is energised, inaccessible parts of the installation should be tested immediately before completion of the whole installation.

A check list, providing a detailed guide of components requiring visual testing (ie consumers mains, switchboards, wiring systems, earthing and electrical equipment), can be obtained from AS/NZS 3017: 2007. The components listed reflect a typical installation and are not comprehensive.

Scrutinising your advertising

Electrical contractor’s placing print media advertisements for their businesses are reminded to ensure they receive and retain copies of all advertising proofs.

Under Regulation 45(1) of the Electricity (Licensing) Regulations 1991, your electrical contractor’s licence is required to be conspicuously displayed on **all** advertising material, including letterheads, websites, business cards, newspaper advertisements, invoices, quotations, billboards, business signage, vehicle signage and business directories such as the “Yellow Pages”.

Recent investigations into non-complying advertisements revealed that many electrical contractors had failed to ensure they had received and reviewed a copy of their proof or had failed to retain a copy.

Advertising proofs should be closely scrutinised for any discrepancies, particularly to identify whether an electrical contractor’s licence number is displayed.

A recent investigation revealed that an electrical contractor had arranged for an advertisement to run in a community newspaper. The contractor had received a copy of the proof, which had the electrical contractor’s licence number prominently displayed.

The advertisement layout was later altered by the production department and the advertisement was published without the electrical contractor’s licence number. The licence number had been removed to incorporate an EFTPOS logo into the advertisement. The electrical contractor had not been notified of the change.

Because the electrical contractor had kept the proof, no action was taken against him.

In another investigation, several electrical contractors had arranged for their businesses to be advertised in a monthly newsletter. The details for the advertisement had been made verbally over the phone and a proof sent to the contractor.

Unfortunately, none of these contractors had reviewed their proofs or had kept them for their records. They were caught unaware when their advertisements were published without their electrical contractor’s licence number displayed.

When you receive a proof, it is important that you immediately review it and contact the advertising agency if any alterations are required before publishing.

A recent audit of the Perth “Yellow Pages” website and the Perth Fremantle & Inner South East Region edition of the “Yellow Pages” revealed that many electrical contractors had failed to include their licence number in advertisements for their business.

The audit found that several contractors had opted to purchase an advertising bundle from Sensis, which included a complimentary advertisement in the “Yellow Pages” website. The online advertisement was also linked to a website for the business that had also been created by the Sensis.

As a bonus for purchasing this advertising bundle, Sensis also provided a complimentary print advertisement in the “Yellow Pages” directory.

Sensis had neglected to send out the proofs to the electrical contractors to confirm business details before publication. Several advertisements were published without the licence number displayed.

Omission of an MEN connection – \$14,000 fine

EnergySafety has previously emphasised the importance of ensuring electrical contractors check and test installations for the multiple earthed neutral (MEN) connection (“Energy Bulletins” May 2001, January 2003, April 2005). Despite these repeated reminders, EnergySafety continues to receive reports of installations rendered defective due to the absence of the MEN connection (link).

In the past two years, EnergySafety has prosecuted thirteen electricians for failing to install an MEN connection.

The MEN connection is used to connect an installation’s earthing system to the supply neutral conductor via a connection from the main earthing bar to the MEN bar.

Exceptions to this are:

- The MEN connection can be made at an earth bar, or link within an owner or user-operated supply substation.
- The MEN connection can be made at the network operator’s neutral bar or link within the installation (ie at the supply substation or meter panel) if required by the network operator.
- The MEN connection can be made through an earthing conductor or terminal supplied by the network operator.

The absence of the MEN connection creates a serious electric shock hazard for consumers and electricians.

When an active to earth fault occurs, the circuit protection device triggers and switches off the electricity, leaving an installation safe.

However, when there is not a direct connection (ie the MEN connection) between the earth and neutral conductors, the installation becomes unsafe as the resistance of the return electrical circuit is too high. This prevents the circuit protection from operating due to insufficient current flow.

If a fault were to arise in this situation, an individual could receive a fatal electric shock from any earthed parts of the installation (eg appliances, taps, water pipes).

In February 2000, an unfortunate incident occurred when a four-year old boy received a fatal electric shock while taking a bath at his home due to the combination of a faulty three-pin plug top of a cord and the absence of a MEN connection. The deceased had touched the “live” bath taps and received an electric shock of 143 V Ac as the electricity passed from his hand, through his body and into the bath water.

An old extension cord in the property developed a short circuit between the active and earth conductor in the cord’s three pin plug top. The family was unaware the plug top of the cord was faulty.

The 15A rewirable fuse protecting the socket outlet in the laundry where the cord was connected failed to activate when a short circuit occurred in the plug top. This was due to an MEN connection not being installed between the earthing system and the main neutral link at the main switchboard of the property. The fault current was insufficient to activate the rewirable fuse but caused the water pipes, taps and earthing system of the house to become “live” at 240 V Ac.

Recently, an electrician was convicted and fined \$9,000 for failing to install the MEN connection (link) at the pole-mounted main switchboard of a new domestic property in Denmark.

This defect was only identified when a Western Power Inspector carried out an inspection of the installation. The installation was energised at the time. To make the installation safe, the Inspector installed a temporary MEN connection (link) at the main switchboard.

The electrician had installed an MEN connection (link) at the house distribution board and had gone as far as preparing an MEN connection (link) for the pole mounted main switchboard. However, he had neglected to connect it.

The electrician had not recorded the checks and tests he carried out. While the electrician had carried out some checking and testing of the installation, he did not perform the mandatory earth fault-loop impedance test (detailed in Clause 8.3.9 of AS/NZS 3000: 2007 “Wiring Rules” and Section 3.7 of AS/NZS 3017: 2007 “Electrical installation – Verification guidelines”). If the electrician had carried out the test correctly, he would have been alerted to the defect.

The electrician, who is also an electrical contractor (sole trader), had also submitted a Notice of Completion to Western Power for the notifiable electrical installing work carried out at the property.

For submitting the Notice of Completion when the work was defective and not complete, the electrical contractor received a penalty of \$5,000.

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In another incident, an electrician failed to connect three smaller earth bars at the main switchboard to the main earth bar (which had the MEN connection and main earth conductor connected to it), resulting in the final sub-circuits connected to the smaller earth bars not having an MEN connection. Also, the earth resistance for the protective-earth-conductors of the final sub-circuits was not adequate to allow the circuit protection to operate.

It was fortunate that this installation was not connected to the electricity supply at the time of the inspection.

In this instance, the electrician was fined \$2,000 with court costs of \$666.90.

The electrician's employer (electrical contractor) was fined \$10,000 with court costs of \$666.90 for submitting a Notice of Completion to Western Power for the unsafe electrical work which had not been checked and tested.

Electrical safety recalls – DC solar isolator switches

EnergySafety wishes to alert electrical contractors about the recent recall of two DC solar isolator switches. Electrical contractors must cease installing the products detailed below and contact the relevant manufacturer for a replacement.

NHP Electrical Engineering DC solar isolator switch

NHP Electrical Engineering Product Pty Ltd DC solar isolator switches were sold nationally at electrical wholesalers between 1 July 2013 and 11 February 2014.

Identification

The recall covers the metallic and plastic model numbers NHP-KDA-432 and KDM-432 with the date codes ranging from x0113 to x3813, where x is any number between 1 and 5.

These last four digits of the date code are the key identifying mark of the affected products and can be found inside the isolator.

Safety risk

These products contain a component that has been assembled with the incorrect material, which causes the "On" switch to remain "On", even if the handle indicates that it is "Off". An electrical contractor is at risk of receiving an electric shock during maintenance and installation of these products.



For further information

Contact NHP Electrical Engineering
Telephone: (03) 9368 4088
Email: NHPReturns@nhp.com.au
Website: <http://www.nhp.com.au>

DKSH DC solar isolator switch

DKSH Australia Pty Ltd DC solar isolator switches sold nationally at electrical wholesalers between 1 August 2012 and 30 August 2013.

Identification

The recall covers "PVPower" part number: XPDCISO1000V32A

Safety risk

There is a risk that the DC isolator may overheat and in some instances, cause a fire.

For further information

Contact DKSH Australia Pty Ltd
Telephone: 1800 006 137
Email: recall.au@dksh.com
Website: www.dksh.com.au/recall

Where to direct your technical queries

For electrical contractors and their electricians with technical queries about AS/NZS 3000:2007 "Wiring Rules" or other relevant standards, please be aware that the following organisations can provide affiliated members with the benefit of **free** advice:

- National Electrical and Communications Association (NECA) Western Australia
Ph: 1300 632 292
Email: necawa@necawa.asn.au
- Masters Electricians (Western Australia)
Ph: 1300 889 198
Email: info@masterelectricians.com.au

For technical queries relating to installations connected to a network operator's distribution system, please contact the relevant network operator on following page:

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Contacts for Technical Queries

NETWORK OPERATOR	OPERATIONAL AREAS	CONTACT DETAILS
Western Power	The South West Interconnected System (SWIS) which covers north from Perth to Kalbarri, east from Perth to Kalgoorlie and Kambalda and the south west of the state from Perth down to Bremer Bay, Albany and Augusta	Phone: 13 10 87 Email: enquiry@westernpower.com.au
Horizon Power	The North West Interconnected System (NWIS) in the Pilbara and the interconnected transmission network in the Kimberley region between Kununurra and Wyndham. Also the smaller Esperance network and over thirty non-interconnected systems in regional towns and remote communities (ie Gascoyne Mid-West and Southern Goldfields areas) not connected to the Non-interconnected System (NIS) (eg Esperance, Norseman and Hopetoun)	Phone: 132 351 Email: enquiries@horizonpower-reply.com.au
BHP Billiton Iron Ore	Newman	Phone: Freecall 1800 677 639 Direct (08) 9175 3602, (08) 9175 3303 Email: supplyauthority@bhpbilliton.com
BHP Billiton Nickel West	Leinster townsite	Phone: (08) 9026 5080
Rio Tinto	Dampier, Wickham, Pannawonica, Tom Price and Paraburdoo	Phone: 1800 992 777 Email: electrical.inspectors@riotinto.com
EnergySafety	For installations that are not connected to one of the network operator's distribution systems (eg remote mine sites, roadhouses, homesteads with private generators)	Phone: (08) 9422 5200 From 1 July 2014: (08) 6251 1900 Email: energysafety@commerce.wa.gov.au

Prosecutions for breaches of electricity legislation*Between 1 January and 31 March 2014*

Name (and suburb of residence at time of offence)	Licence No.	Legislation and Breach	Offence	Date of Offence	Fine (\$)	Court Costs (\$)
<i>Lucas Morgan (High Wycombe)</i>	<i>EW160335</i>	<i>Regulation 49(1) E(L)R 1991</i>	<i>Carried out unsafe and substandard electrical work</i>	<i>29/11/2011</i>	<i>5,000.00</i>	<i>666.90</i>
<i>Herbert Tournay (Denmark)</i>	<i>EW102922</i>	<i>Regulation 49(1) E(L)R 1991</i>	<i>Carried out unsafe and substandard electrical work</i>	<i>02/02/2012</i>	<i>9,000.00</i>	<i>N/A</i>

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Name (and suburb of residence at time of offence)	Licence No.	Legislation and Breach	Offence	Date of Offence	Fine (\$)	Court Costs (\$)
<i>Jim Tournay T/ As Tournay's Electrical Services (Denmark)</i>	<i>EC001336</i>	<i>Regulation 52(3) E(L)R 1991</i>	<i>Submitting a Notice of Completion to the network operator for notifiable work that had not been completed</i>	<i>14/02/2012</i>	<i>5,000.00</i>	<i>N/A</i>
<i>Acrebay Pty Ltd T/As Essential Cabling (Jandakot)</i>	<i>EC007835</i>	<i>Regulation 52(3) E(L)R 1991</i>	<i>Submitting a Notice of Completion to the network operator for notifiable work that had not been completed</i>	<i>17/02/2011</i>	<i>20,000.00</i>	<i>1,786.15</i>
<i>3TP Constructions Pty Ltd T/As 3TP Electrical Contracting (Karratha)</i>	<i>EC009750</i>	<i>Regulation 52C(1)(b)(i) E(L)R 1991</i>	<i>Failing to check and test the electrical work after completion to ensure it was safe and complied with AS/NZS 3000:2007 "Wiring Rules"</i>	<i>20/01/2012</i>	<i>10,000.00</i>	<i>666.90</i>
<i>Western Wiring Electrical Contractor Pty Ltd (Dianella)</i>	<i>EC008582</i>	<i>Regulation 52C(1)(b)(i) E(L)R 1991</i>	<i>Failing to check and test the electrical work after completion to ensure it was safe and complied with AS/NZS 3000:2007 "Wiring Rules"</i>	<i>12/03/2014</i>	<i>6,000.00</i>	<i>781.55</i>
<i>Hamersley Iron Pty Ltd T/As Rio Tinto (Perth)</i>	<i>NLH</i>	<i>Regulation 242(1)(b) ER 1947</i>	<i>Connected the supply of electricity to a premise that was likely to cause consumers' electrical installations to become unsafe</i>	<i>12/01/2012</i>	<i>35,000.00</i>	<i>666.90</i>
<i>Electricity Networks Corporation T/ As Western Power (Perth)</i>	<i>EC004931</i>	<i>Regulation 242(1)(b)</i>	<i>Connected the supply of electricity to a premise that was likely to cause consumers' electrical installations to become unsafe</i>	<i>03/02/2012</i>	<i>50,000.00</i>	<i>1,126.90</i>

Legend NLH No Licence Held

EA Electricity Act 1945

E(L)R Electricity (Licensing) Regulations 1991

* Global Fine or Costs issued

gas focus

Ventilation requirements for bayonet point installations

In Western Australia, it is mandatory to install fixed ventilation in a room other than a kitchen; where a bayonet point is installed.

The required ventilation is specified in the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 and AS/NZS 5601.1:2013 and can be summarised as:

- the room must have two permanent ventilation openings direct to outside;
- one of the vents must be situated near the top of the room and the other near the bottom of the room;
- the vents must be separated by a distance of not less than 1.5 m measured vertically; and
- each vent must have an aggregate open area of not less than 25 000 mm².

Clause 504(2)(a) of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 requires the room volume to be greater than 30 m³. The Director of Energy Safety has issued a Notice of Exemption GV/E 12/56 that removes this requirement. Note that AS/NZS 5601.1:2013 clause 6.10.6.3 limits the maximum gas consumption of flueless space heaters:

- thermostatically controlled to 0.4 MJ/h for each m³ of room volume; or
- not thermostatically controlled to 0.2 MJ/h for each m³ of room volume.

It is required that the vents are direct to outside. Direct to outside is defined in AS/NZS 5601.1:2013 as meaning:

Any one of the following options provided the ventilation path maintains equal or greater free area and is unobstructed by building material or insulation:

- (a) Directly through an outside wall (preferred option).
- (b) Through an outside wall but offset.
- (c) Into a cavity ventilated to outside.
- (d) Into an underfloor space ventilated to outside.
- (e) Into a roof space ventilated to outside.

Where there is more than one bayonet point installed in a room then the ventilation requirements apply to each of those bayonet points individually. That is if there are two bayonet points in a room then that room must have vents with a minimum open area of 50 000 mm² high and low.

Use of inappropriate fittings and Smell of Gas (SMOG)

EnergySafety often receives complaints about the smell of gas in buildings (SMOG). Usually either the home owner or business owner is frustrated at calling in a gas fitter only to be told there is no gas leak. It may be intermittent and the smell may not be present when the gas fitter is present. Soapy water does not always work (usually only for larger leaks). The number 1 tool in a gas fitters tool box should be a manometer (u tube or water gauge), however technology moves along and electronic/digital manometers are now available. Having these items is useless unless the gas fitter knows how to use them. Digital gas leak detectors are also available.

The call to EnergySafety is the last resort. What gas inspectors find is quite worrying, most leaks stem from the original gas fitter having poor welding procedures or using inappropriate fittings when assembling the gas installation. Most common in these categories relate to the use of fittings with parallel threads or poor forming of flares.

Ranked highly in the number of complaints stemming from leaks with screwed fittings arise in commercial gas installations where larger diameter fitting lines are used. As all commercial appliances require an isolating valve these are usually connected with flared

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Continued from previous page fittings, larger flexible hose assemblies, screwed elbows and tube bushes.

Unfortunately some have trouble recognising a parallel threaded fitting compared to one having a taper. Examples shown include a M&F elbow screwed into a regulator “bottomed out,” in this case the gas fitter attempted to seal the joint with an anaerobic thread sealant.



Steel elbow and threadseal tape removed from the fitting.

A steel elbow found on a commercial range had literally a swinging elbow, the amount of threadseal tape removed from this joint is also shown. In this particular case the gas fitter assembled the fittings with a copious amount of threadseal tape. A tapered thread with a tapered mating threaded fitting will “Bite” with only a small amount of threadseal tape, or a small amount of pipe jointing paste.

A flexible hose assembly attached to an appliance isolating valve apparently “leaked” when first assembled by the gas fitter. To seal this joint the gas fitter used an anaerobic sealant to seal the joint. Once the sealant had hardened not only was the seal made, but the nut was also locked. Where was the comparable fitting?

Now when connecting a flexible hose assembly, one end of that hose has an angled mating surface, to be mated with a comparable fitting, again this joint is a dry seal, therefore no tape or threadseal tape should be used.

In the case of the flare, after the flare has been made do you again anneal this flare? This is also a dryseal with mating surfaces.

If you are unsure of what has been mentioned above and that you may have been guilty of these practices in the past, it may be worthwhile checking with the references in AS/NZS 5601: 2013. You do have one don't you?

AS/NZS 5601.1:2013 Section 6.4 Air supply for gas appliances

AS/NZS 5601.1:2013 is the Standard of reference as from March 16, 2013. This new Standard includes significant changes to the requirements for air supply for gas appliances (Section 6.4). These changes are required so as to ensure adequate combustion air for gas appliances in modern energy efficient buildings in which incidentally occurring (adventitious) ventilation is being minimised.

Failure to ensure adequate air for gas appliance combustion will result in an unsafe and therefore an unacceptable situation.

For bayonet fittings the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 Clause 504 details the requirements for air supply (ventilation) and this still applies along with the specific requirements of AS/NZS 5601.1:2013 (see relevant article in this bulletin).

Where buildings were approved for construction **prior** to the acceptance of AS/NZS 5601.1:2013 the air requirements remain as previous. Additional natural ventilation is only required should the total energy consumption of the appliances in the room volume exceed three (3) Megajoules per cubic metre of room volume.

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“Bottomed out” M&F elbow screwed into a regulator.

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Section 6.4.4 provides the requirements and detail.

Air supply for specific gas appliances

These requirements are found in the associated clauses and appendices. Where the requirements conflict the specific requirements apply.

The specific appliance ventilation requirements include:

- A. Multiple cookers in schools and the like, see clause 6.10.1.3
- B. Decorative flame effect fires (not flame effect space heaters), see Clause 6.10.9.5.
- C. Laundry dryers, see Clauses 6.10.14.4 and 6.10.14.5.
- D. Refrigerators, see Clause 6.10.18.3
- E. Quick connect devices, see paragraph N3.1.1, Appendix N.
- F. Flue-less space heaters in Western Australia, see Paragraph N3.2.2, Appendix N.

Where buildings are approved for construction **after** the adoption of AS 5601.1:2013 Section 6.4.5 applies. The following information is provided in an effort to assist gas fitters in meeting the requirements. This information alone is not adequate to ensure compliance and must be applied in conjunction with AS 5601.1:2013.

For volumes containing only flue-less appliances

Note: There are special requirements for flue-less space heaters and these can be found in the Regulations and AS/NZS 5601.1:2013.

Calculate total room volume = Length x width x height.

Calculate total gas consumption for all gas appliances.

Divide total consumption by the room volume.

If less than 3 Mj/m³ of room volume then no additional ventilation is required.

If more than 3 Mj/m³ then use Table 6.2 for calculations and vents.

For volumes containing only flued appliances

Calculate total room volume = Length x width x height.

Calculate total gas consumption for all gas appliances.

Divide total consumption by the room volume.

If less than 0.4 Mj/m³ of room volume then no additional ventilation is required.

If more than 0.4 Mj/m³ then use Table 6.2 for calculations and vents.

For volumes containing both flued and flue-less appliances

Calculate total room volume = Length x width x height

Calculate total gas consumption for all gas appliances.

Divide total consumption by the room volume.

If the total is less than 0.4 Mj/m³ of room volume no additional ventilation is required.

If the total is more than 0.4 Mj/m³ then check if the flue-less component is greater than 3 Mj/m³ of room volume:

- If no then calculate and ventilate as if only flued appliances.
- If yes then calculate (using total Mjs) and ventilate as if all flue-less appliances.

Utilise Table 6.2 for calculations and vents.

Waste gas flare at Resource Recovery Facility

The Western Metropolitan Regional Council's Resource Recovery Facility has a process plant that treats Municipal Solid Waste diverting up to 75% of waste from landfill and recovering valuable recyclables while producing rich organic fertiliser. The plant also generates biogas which generates enough power through a gas engine-generator for the process. The facility is located at the corner of Brockway Road and Lemnos Street in Shenton Park.

There are three main components of the plant, these being the Materials Recovery Facility, Bioconversion Facility and Ancillary Services Area. The Bioconversion Facility is an innovative patented hybrid (aerobic/anaerobic/aerobic) biological process inside a closed vessel that accelerates the natural bioconversion cycles for a highly efficient production of biogas/waste gas and stabilised organic fertiliser.

The entire process is monitored and controlled via a Process Control System. An independent Safety Instrumented System monitors key process safety parameters and facilitates process shutdown when required. This system includes an Oxygen and Methane gas analyser to prevent transitional gas supply (inerting) when operating close to the flammable region.

A waste gas flare is used for both the burning of site waste gas and for additional odour control. The flare is rated for a design flow rate of approximately 700 Nm³/h at a 60% Methane level and contains normal and low quality waste gas burners and a natural gas pilot.

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When the waste gas flow rate does not contain a sufficient level of methane, supplementation is provided by mixing natural gas prior to the flare burners to ensure a combustible mix.

Due to the variability of the waste gas supply, EnergySafety at the request of the independent Type B gas appliance inspector issued an extension of the gas for commissioning period so that the

plant could safely operate until the waste gas became available to fully commission the flare.

Although the use of appliances operating on gas for commissioning while being used for production purposes is prohibited, it was recognised by EnergySafety that at this site the gas flare is a primary safety device and must be available while the plant is in operation.



Western Metropolitan Regional Council's Resource Recovery Facility

Prosecutions for breaches of gas legislation

1 January 2014 to 31 March 2014

Name (and suburb of residence at time of offence)	Licence No.	Legislation and Breach	Offence	Fine (\$)	Court Costs (\$)
Jason Aaron Nominees Pty Ltd (Pascoe's Gas & Water) (Willetton)	GF 7676	GSR r34 ECA s14(d) ECA s20(3)	Failing to make available record of employed gas fitters Failing to comply with the request under Section 14(d) Giving false or misleading information under Section 14(d)	14,750	1,657.30
			Total:	14,750	1,657.30

- Legend NLH No Licence Held
 GSA Gas Standards Act 1972
 GSR Gas Standards (Gasfitting & Consumer Gas Installations) Regulations 1999
 ECA Energy Coordination Act 1994

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Summary of infringements for breaches of gas legislation

1 January to 31 March 2014

Legislation and Breach	Offence	Number of Infringements	Fine (\$)
GSA S13A(2)	<i>Engaging in an operation or carrying out work or process, of a kind prescribed to be nature of gasfitting work otherwise than in a prescribed capacity without a permit or certificate of competency</i>	1	1,000
GSR R 18(2)	<i>Failing to ensure gas installation complies with prescribed requirements</i>	3	1,800
GSR R28(2)	<i>Failing to attach approved badge or label on completion of work</i>	5	2,000
GSR R28(3)	<i>Failing to give notice of completion of gasfitting work within required time</i>	3	1,200
GSR R26(1)(a)	<i>Failing to ensure installation is gas-tight</i>	1	600
	Total:	13	6,600

Legend GSA Gas Standards Act 1972

GSR Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999