

# energy

## Bulletin

ISSN 1323-8957

### • In this issue...

- RCDs now mandatory in all rental properties 1
- No RCD No Second Chance 2
- Gas Appliance Rectification Programme 2
- ATCO completes acquisition of WA Gas Networks 3
- Electrical Focus 4**
  - Too many electrical apprentices suffering shocks 4
  - 2011 Electrical Installation Inspectors' Conference 4
  - The hefty price for not taking the time to test and check electrical work 5
  - Western Power prosecuted for another two dangerous transpositions 5
  - Horse Fatality Prompts Safety Concerns for Lighting Tower Installations 7
  - Prosecutions for breaches of Electricity Legislation 8
- Gas Focus 10**
  - Windimurra Power Station 10
  - Variation/exemptions, performance based requirements and dispensations information required for compliance badges and plates 10
  - First performance based requirement for WA 11
  - Recognition of the Polytechnic West Automotive Training Course, LP Gas mobile unloading, decommissioning and scrapping for a Gasfitting Authorisation 12
  - Would you shell out \$1200 for a gas installation such as this? 13
  - New approved piping systems 13
  - Is your gas fitters' register up to date? 14
  - 'Tube out by others' in new house construction 15
  - Variation on minimum clearances to downward surfaces for replacement of gas cooking appliances installed before 1983 15
  - Professional development for training organisations 16

## RCDs now mandatory in all rental properties

It has been compulsory since 2000 for all new homes to have two Residual Current Devices (RCDs) fitted to protect the power point and lighting final sub-circuits as part of the initial electrical installation. Homes built before 2000 were not required to have RCDs.

Since 2009, new laws were introduced to require home sellers and landlords to install two RCDs protecting all power points and lighting circuits before they offer the house for sale or rent.

A transition period was allowed for continuing tenancies. That transition period has now expired. As of the 8 August 2011 it is now mandatory for all residential rental properties to be fitted with at least two RCDs, irrespective of whether they are new tenancies or existing ones.

Advertisements were run in local and regional newspapers to attract the general public's attention on the legislation. Letters were also sent to all landlords and property managers advising them of the deadline to have RCDs installed on all rental properties.

Electrical inspectors will monitor compliance with the regulations and respond to complaints. Penalties of up to \$15,000 for individuals and \$100,000 for corporate bodies may apply if RCDs are not fitted.

The new regulations address rental properties and properties being sold. Other owner-occupied homes built before 2000, will not be protected. While it is not mandatory for owners of these properties to have RCDs, EnergySafety strongly recommends that they do.

Electrical contractors attending properties constructed prior to 2001 are urged to draw their client's attention to the benefits of installing RCDs. A letter is available on the EnergySafety website to assist contractors in highlighting the importance of RCDs to home owners.

For more information visit the EnergySafety website at [www.energysafety.wa.gov.au/rcd](http://www.energysafety.wa.gov.au/rcd) or phone 9422 5200.



**KEN BOWRON**  
**DIRECTOR OF ENERGY SAFETY**



From 8 August 2011, all rental properties must have at least two RCDs fitted.

Laws introduced in 2009 require all rental properties to be fitted with two RCDs (Residual Current Devices) protecting all power and lighting circuits. The laws provided for a transition period to have these devices fitted. That transition period is ending. Landlords should call a Licensed Electrical Contractor to have RCDs installed urgently if you have not already done so. Visit [www.energysafety.wa.gov.au/rcd](http://www.energysafety.wa.gov.au/rcd) for more information.

 Government of Western Australia  
Department of Commerce  
EnergySafety

Install. Test. Survive.  
[energysafety.wa.gov.au](http://energysafety.wa.gov.au)

# 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](mailto:energysafety@commerce.wa.gov.au)  
Internet: [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au)

## No RCD No Second Chance

The RCD campaign between January and April this year has been well received by the target audience, with 42% of homeowners either having an RCD installed, requesting a quote or testing their existing RCDs.

The campaign aimed to deliver three key messages to homeowners:

- Check – Do you have RCDs and how many?;
- Install – if less than two; and
- Test.

These key action messages of the campaign have reached the target audience, with the 'Install' message generating the greatest awareness with 79% of homeowners agreeing that the ads would make them want to install RCDs.

The campaign had a high awareness with 76% of respondents recalling the television advertisements. The press/online and radio advertisements had a lower awareness with only one quarter of homeowners recalling at least one advertisement.

Empty nesters (57%) were more likely than families (37% young families; 36% older families) to recall both of the television ads. The 55-64 age group were also more likely to recall both ads (59%) over the 35-44 age group (30%) and 45-54 age group (40%).

The high recall and awareness can be attributed to the fact that the campaign was well liked, believable and memorable. 65% of homeowners indicated that the TV ads were "some of the best ads giving advice".

Almost three out of four respondents believe the campaign messages completely and no one rejected the message, indicating that the messages are credible. The campaign is also memorable with 63% of homeowners indicating that they would definitely remember the TV campaign.

However, more work is required to increase awareness and knowledge of RCDs, with only 39% of homeowners indicating they had heard of the term RCD. Knowledge of RCDs was significantly lower among females, over 65's and retirees and households with an income of less than \$55,000.

There is also confusion over the number of RCDs required in a household with 77% of homeowners unsure or incorrect, and only 23% of homeowners indicating they need a minimum of two RCDs.

The RCD evaluation survey for electrical contractors also showed that there has been an increase in enquiries and installations of RCDs since the campaign launched in January 2011. 69% of contractors who responded have experienced an increase in the number of RCD enquiries with 53% experiencing an increase of between 5-10 enquiries per week.

64% have experienced an increase in the number of RCD installations.

EnergySafety will continue to advertise the importance of RCDs and the need to test them regularly in future campaigns.

## Gas Appliance Rectification Programme

The replacement and servicing stage of the Gas Appliance Rectification Programme has commenced and is being undertaken by Alinta Assist.

Alinta Assist has developed a schedule of works, providing indicative dates of when work is due to commence by suburb. The schedule is available to download from EnergySafety's website.

The schedule initially targets the older suburbs which contain the largest concentration of pre-1980 gas appliances, particularly gas cookers.

As part of the programme, we have been conducting research and testing of appliances found during the inspection process. This ongoing research has clarified which appliances are at risk and require replacement and/or servicing. It has also identified those appliances that will continue to operate safely on the changed gas.

*Continued over page*

© Department of Commerce 2011  
ISSN 1323-8957

The Energy Bulletin is published by EnergySafety, a Division of the Department of Commerce. It is distributed free of charge to licensed electrical contractors, in-house electrical installers, electrical inspectors, gas certificate holders, gas authorisation holders, gas permit holders and gas inspectors.

The Energy Bulletin may be downloaded free of charge from EnergySafety's website.

Articles in this publication may be reproduced, provided they are reproduced in full and show acknowledgement to EnergySafety.

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

### For enquiries:

Editor: Candace Beilby

Phone: 08 9422 5208

Fax: 08 9422 5244

Email: [candace.beilby@commerce.wa.gov.au](mailto:candace.beilby@commerce.wa.gov.au)

Internet: [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au)

*Continued from previous page*

Registered customers will be contacted by letter advising them that the replacement and servicing of the pre-1980 appliances considered at risk will begin in their area soon and that they will be contacted to arrange a suitable time to carry out the required work.

The modification and replacement stage began in May 2011 and will be completed by the end of 2012, before the changed gas comes on stream in 2013.

Visit [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au) for more information.

## **ATCO completes acquisition of WA Gas Networks**

In July 2011 ATCO, a Canadian Utilities asset owner, successfully completed its acquisition of WA Gas Networks (WAGN) from WestNet Infrastructure Group. WAGN is now a 100 per cent owned subsidiary of Canadian

Utilities, an ATCO company, and will trade under the name ATCO Gas Australia.

ATCO Gas Australia continues to be the natural gas distribution utility company serving the Perth metropolitan area and surrounding regions. Connecting more than 630,000 customers through 12,800km of natural gas pipelines and associated infrastructure. It provides service throughout the Perth metropolitan area, including Mandurah and the surrounding regions of Geraldton, Bunbury, Busselton, Kalgoorlie, Albany, Harvey, Pinjarra, Brunswick Junction and Capel.

Included in the acquisition is WestNet Infrastructure Group's information technology division, a supplier of information technology services to utility companies.

ATCO has been in Australia since 1960 and currently operates three power generating facilities in Australia, including one in Karratha.

ATCO has a broad portfolio and operating expertise in power generation, the transmission and distribution of electricity and natural gas as well as the gathering, processing, storage and liquid extraction of natural gas.

More information can be found at [www.atcoaustralia.com.au](http://www.atcoaustralia.com.au).

# electrical focus

## Too many electrical apprentices suffering shocks

Shock reports received by EnergySafety involving electrical apprentices remain far too high.

Year	No. of shock Reports
2006	5
2007	16
2008	30
2009	18
2010	11
2011	8 (to 30 June)

The above figures are a clear indication that apprentices are not being adequately supervised. They are particularly concerning because actual shock numbers are likely to be under-reported.

Electrical contractors and supervising electricians are reminded of their responsibility to ensure that all apprentices are adequately supervised. Electrical apprentices require supervision for their safety and training and the safety of others. The amount of supervision, direct (constant) or general, requires continual assessment of an apprentice's experience, competence and the task undertaken.

Regulation 50 of the Electricity (Licensing) Regulations 1991 prescribes the specific requirements for effective supervision of electrical work.

If an apprentice receives a shock it implies that supervision was not adequate. Electricians ought to be the tradespersons least likely to suffer electric shocks. This especially applies to electrical apprentices.

Licensed electrician Gordon Martin was convicted and fined in the Joondalup Magistrates Court on 19 May 2011 for failing to adequately supervise an electrical apprentice. In his judgement the Magistrate said:

*"I noted the seriousness of this offence, and the fact that (the apprentice) was fortunate not to have suffered more serious or even fatal injuries. I noted that other electrical apprentices in similar situations have suffered serious injuries or even died when left to work unsupervised, even for very brief periods. I noted that the supervising electrical worker has the responsibility to ensure that the apprentice being supervised can actually carry out the work safely. In this situation, Mr Martin was not even aware of (the apprentice's) year level, so could not, as Regulation 50(4) requires, have due regard to the level of competence of the apprentice being supervised. Further, clearly, (the apprentice) ought not to have been working on live equipment. I noted the fact that the apprentice's actions may have contributed to the electric shock (i.e. (the apprentice) touching the live busbar) is not a relevant factor in mitigation when the offence is a failure to supervise."*

EnergySafety requests all electrical contractors and supervising electricians to devote more time and renewed attention to apprentice supervision so that the worrying report numbers listed above fall to zero in the very near future. Failure to supervise apprentices effectively will result in prosecution.

## 2011 Electrical Installation Inspectors' Conference

This year's EnergySafety Electrical Installation Inspectors' Conference held on 26 July 2011 had a record turnout, with close to one hundred guests attending.

This annual event hosted by EnergySafety gathers Inspectors from all across Western Australia who benefit from presentations delivered by prominent electrical industry speakers. Attendees included network operator electrical installation inspectors from EnergySafety, Western Power, Horizon Power, NickelWest, BHP Billiton Iron Ore, Rio Tinto and the Christmas Island Power Authority, as well as representatives from WorkSafe and the Fire and Emergency Services Authority of Western Australia (FESA).

Guest speakers included John Paskulich, Advanced Skills Lecturer from Central TAFE who gave an overview on photovoltaic (PV) installations as well as outlining the responsibilities of installers to ensure that PV



Continued over page

*Continued from previous page*

installations comply with AS/NZS 3000:2007, Wiring Rules and other PV standards such as AS 5033:2005 and AS 4777:2005, as many new PV Installations have been found to have serious defects.

Of great interest, was the presentation by Marty Denham from QEC Global who spoke on the specialised field of electrical fire investigations.

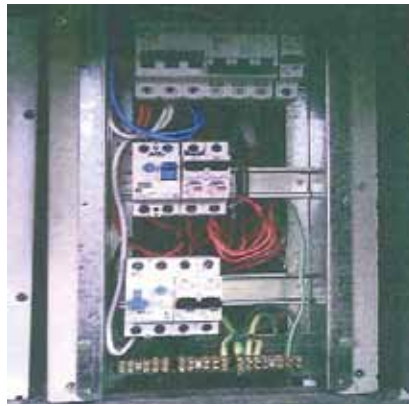
## The hefty price for not taking the time to test and check electrical work

Earlier in the year, we published an article reminding contractors to ensure their electricians effectively earth metallic DIN kit switchboards.

Recently an electrician carried out a job where he replaced the existing single phase consumer's mains with an underground three-phase consumer's mains cable as well as replacing the main switchboard with a new metallic DIN kit and circuit breakers. The electrician failed to carry out the correct checks and tests of his completed work. Had he carried out the verification of the installation, he would have discovered the DIN kit was not earthed (see image showing that the earth bar is insulated from the metallic frame).

By submitting a Notice of Completion to the network operator, the electrical contractor stated the work undertaken had been completed, verified (checked and tested), was safe and complied with the Regulations including AS/NZS 3000:2007, Wiring Rules.

The receipt of the notice by Western Power triggered an inspection of the installation which revealed the serious defect.



The electrician/contractor pleaded guilty to carrying out unsafe and substandard work and to submitting a Notice of Completion to the network operator when the electrical work was defective and therefore not complete. The Magistrate issued a global penalty of \$5,000 with court costs.

In another case of failure to check and test, an electrician/electrical contractor failed to check the earth conductor was connected to the socket outlets at the laundry, bathroom and bedroom of a property. This is a breach of the Wiring Rules and of the Electricity (Licensing) Regulations 1991.

The electrical contractor submitted a Notice of Completion certifying that he had tested and checked his work to ensure compliance with the Regulations when clearly, this was not the case.

The electrician/electrical contractor pleaded guilty to the unsafe and substandard work and for the submission of the notice when the work was defective and not complete. The electrical contractor received a fine of \$10,000 and the electrician was penalised \$5,000 along with global court costs.

Taking the time to carry out the correct testing procedures can prevent costly errors. As an electrical contractor, it is your responsibility to ensure your employees have all the required testing equipment, are well

versed with checking and testing procedures and carry out all the tests as prescribed by AS/NZS 3000:2007.

## Western Power prosecuted for another two dangerous transpositions

Western Power has again been prosecuted for transposing the active and neutral conductors and endangering the public.

In the first case, Western Power was prosecuted for incorrectly connecting a mini pillar during a conversion from a single phase (240 volts) underground distribution system to a three-phase (415 volts) system at a property in Dongara. This resulted in the property owner receiving a severe electric shock from the main switchboard enclosure.

A Western Power linesman and trainee linesman had carried out the mini pillar conversion work which involved the disconnection of an existing supply cable from a single-phase pole-mounted transformer and the re-connection to a new ground-mounted three-phase transformer. This active and neutral transposition was not identified at the time by the linesmen as they did not properly check and test their work.

This led to a voltage of 415 volts, instead of 240 volts being supplied to the single phase appliances and the metallic main switchboard/meter enclosure becoming 'live' (to ground) via the multiple earthed neutral connection (MEN). The metallic switchboard was 'live' and dangerous.

EnergySafety's investigation revealed that Western Power did not provide adequate training, instruction and supervision to both linesmen, and their management

*Continued over page*

*Continued from previous page*

failed to ensure the worker's were competent to carry out this particular job.

Western Power pleaded guilty for failing to operate its network in such a way as to provide safety for persons, including employees of and contractors to the network operator. The Magistrate concluded that the network operator did not ensure that it took reasonable and practicable means to ensure safety of its employees and fined Western Power \$15,000 as a penalty plus court costs.

Since the incident, Western Power has begun developing work practices and procedures for carrying out the single-phase to three-phase conversion work on mini pillars. Both linesmen also received disciplinary action from Western Power.

In another case, a Western Power crew transposed the active and neutral conductors of the service mains during connection to the overhead distribution system at a residential property in Cloverdale.

The transposition was discovered after the property tenant reported she had been receiving shocks from electrical appliances and kitchen taps.

The linesman responsible for the work had signed Western Power's Service Connection Testing Form, stating that the service connection had been tested in accordance with testing procedures.

Western Power pleaded guilty for not maintaining their service apparatus in a safe and fit condition for supplying electricity. The Magistrate convicted and fined the network operator a penalty of \$12,000 plus court costs. The linesmen, who undertook the work, were suspended for four weeks and were required to undergo retraining.

In both cases, Western Power argued that only a 'minor shock' was suffered as a result of the non-compliance (polarity transposition). This argument is incorrect as there is no such thing as a minor shock. The severity of the electric shock depends on the situation, which is totally outside the control of the network operator. All electric shocks have the potential to cause death or serious injury. Surviving a shock is often attributed to 'good luck'.

AS/NZS 60479 provides basic guidance on the effects of shock current on human beings and livestock. It details the minimum voltage and current thresholds before a person may suffer patho-physiological effects such as cardiac arrest, breathing arrest, and burns or other cellular damage. The probability of ventricular fibrillation increases with current magnitude and time.

Patho-physiological effects commence at a current of 40 mA for 2 seconds, 100 mA for 0.5 second or 500 mA for 10 milliseconds.

Factors affecting this 'good luck' are detailed below.

When a person receives a shock, electric current flows through their body to earth. The amount of electric current flow depends on the voltage of the live part touched by the victim and the electrical impedance<sup>1</sup> to earth. The latter has three components:

- the person's own body impedance;
- the resistance of the footwear worn; and
- the resistance of the earth (ground) itself.

The impedance of the human body varies from 750 to 2,000 Ohms. The resistance of the earth or ground can vary widely (typically from 1 to 10,000 Ohms), depending on soil type and moisture content. The

footwear resistance can also vary widely from very high (no impurity plastics or rubber soles tending to infinity resistance) to zero resistance (bare foot).

These three resistances are in series and therefore are additive. The amount of voltage applied across a person's body will vary depending on the resistance of the footwear and ground. The higher the ground resistance the lower the voltage across the person's body. The current will remain the same though the body, ground and footwear but will vary depending on the total resistance. The lower the resistance the higher the current.

The voltage and current available at a metallic tap or earthed appliance enclosure, due to an active neutral transposition, will be full voltage (240 volts ac) and the flow of electric current will only be limited by the body's impedance and resistance of the footwear and ground.

A person standing barefoot on wet ground, a child sitting in a bath, or a person taking a shower (very low ground resistance), would experience a shock current of approximately 0.12 to 0.3 Amperes (or 120 mA to 300 mA) if they touch a 'live' part (tap) at full mains voltage of 240 V. The current flow is equal to the voltage (in volts) divided by the resistance (in Ohms). The only resistance would be the person's body resistance. A current of 120 mA would cause physiological effects within 0.45 seconds and the probability of ventricular fibrillation would increase to above 50% after 1.2 seconds.

A current of 300 mA would cause physiological effects within 0.25 seconds and the probability of ventricular fibrillation would increase to above 50% after 0.7 seconds.

*Continued over page*

*Continued from previous page*

Ventricular fibrillation will stop the person's heart and cause death. Once ventricular fibrillation occurs death will result unless rescuers can remove the voltage rapidly and apply a defibrillator. Even then brain damage can occur.

Protective RCDs in Australian domestic residences operate at 30 mA within 40 to 300 milliseconds. This current will cause the person to sense a definite shock, but it is insufficient to cause fibrillation even if the RCD was to disconnect the electricity source in the blink of an eye.

In a recent case, Western Power argued that serious harm from shocks caused through polarity transpositions is unlikely because "there are parallel paths to earth", implying that all the current does not pass through the victim. This is an entirely untrue statement. The victim receives the full amount of whatever voltage is present. The current flow through the body depends on the voltage present and the three series impedances and resistances mentioned above.

The second 'good luck' factor is the victim's age and general state of health. If the person has a weak heart, is elderly or is a small child they may suffer death at voltages well below the normal mains level. A child in a bath is at a definite risk if the bath taps are 'live' through a polarity transposition. Even robust, healthy adults have experienced severe harm at very low voltages (15 volts ac) while immersed in a swimming pool.

Therefore, either shock described above could have resulted in death or severe injury, were it not for the 'good luck' factors and it is incorrect to suggest otherwise.

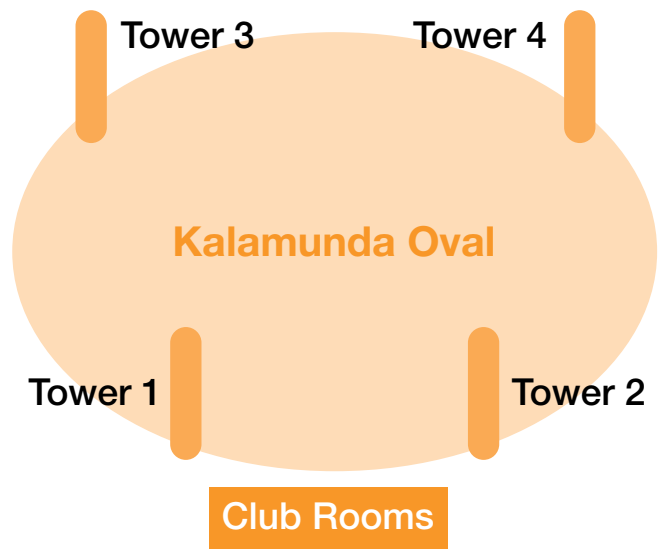
<sup>1</sup> Impedance is the effective resistance of an alternating current electric circuit from the combined effects of resistance and reactance (inductance and capacitance).

## Horse fatality prompts safety concerns for lighting tower installations

Recently, a police horse (Hercules) tragically died in an electrical accident after collapsing near a metallic lighting tower at the Kalamunda Agricultural Show.

Two police officers also received electric shocks when they attempted to remove Hercules' bridle and saddle when trying to revive and insulate him with cardboard from the electrified ground.

Kalamunda Oval has four lighting towers. Two were installed initially near the club rooms and two at a later date. These towers are 25 metres high and are fitted with eight 2kW metal-halide floodlights (Sylvania Briteline).



*Diagram showing the location of the lighting towers.*



*Photograph of faulty lighting fitting showing phase to earth fault and no protection for the cable where it passes through the reflector.*

The two towers (towers 1 and 2) installed near the sporting club rooms were supplied from a 63 ampere Type D ACB and earthed by running earthing conductors. The two towers (towers 3 and 4), furthest from the clubrooms, were also protected by a 63A Type D ACB but each were earthed by an electrode instead of a running earthing conductor. The lighting fittings in both these towers had phase to earth faults and, due to the high earth resistance, were 'live' with a small current flowing to earth.

All the lighting fittings were inspected and found to be unsafe as they did not have a grommet protecting the supply cable into the lamp's reflector.

The voltage across the ground between towers 3 and 4 was measured to be up to 415 volts as the earth fault in the lighting fittings was on different phases.

*Continued over page*

*Continued from previous page*

Hercules received a fatal electric shock across his feet and through his body as he approached tower 4.

In addition, the Type D ACBs would have never operated due to an earth fault or short circuit and there was insufficient fault current available at the source of supply to trigger the protective device.

A Type D ACB requires 12.5 times its rated current to operate, or 788 amperes. The measured fault current (using an earth-loop impedance tester) was 630 to 665 amperes per phase at the location of the ACBs. Therefore, a Type D ACB is not suitable. A Type C ACB should have been fitted, as it operates at 7.5 times its rated

current, or 472 amperes, well below the 630 ampere measured level.

The two towers (Towers 3 and 4) which were not effectively earthed, had earth faults and, due to the high ground resistance, would have drawn an earth fault current of 9 amperes at the closest tower and 5 amperes at the furthest tower, clearly far below the current needed to operate a 63 ampere Type D ACB.

Had a loop impedance test been performed at the towers, it would have revealed that the ACB would never have operated.

EnergySafety is urging all electrical contractors to bring this matter to the attention of their electricians.

Where work is being performed on a similar installation, please ask your electricians to check for adequate grommets and whether the towers are effectively earthed by measuring the earth-loop impedance.

Where installations are not earthed, please report the unsafe installation to the relevant network operator. The network operator will then arrange for an Inspector to attend the site and issue an Order to rectify the defect. Electricians, if they have the authority, may also disconnect the electricity supply and tag the circuit "Out of Service".

### **Prosecutions for breaches of Electricity Legislation 1 June to 31 August 2011**

<b>Name (and suburb of residence at time of offence)</b>	<b>Licence No.</b>	<b>Legislation and Breach</b>	<b>Offence</b>	<b>Date of Offence</b>	<b>Fine (\$)</b>	<b>Court Costs (\$)</b>
Siegfried Stumpf (Canning Vale)	EW118709	E(L)R Regulation 49(1)	Carried out unsafe and substandard electrical work	30/06/09	5,000.00	649.70
Siegfried Stumpf T/As Ziggy's Electrical (Canning Vale)	EC004514	E(L)R Regulation 52(3)	Sending Notice of Completion of notifiable work in relation to uncompleted work			
Seamus Connolly (Gidgegannup)	EW117584	E(L)R Regulation 49(1)	Carried out unsafe and substandard electrical work	29/06/09	7,500.00	649.70
	EC006017	E(L)R Regulation 52(3)	Sending Notice of Completion of notifiable work in relation to uncompleted work		5,000.00	
John Farrow (Ocean Beach)	EW122699	E(L)R Regulation 49(1)	Carried out unsafe and substandard electrical work	29/04/09	1,000.00	121.95
John and Michelle Farrow T/As Ocean Beach Electrical (Ocean Beach)	EC005330	E(L)R 1991 Regulation 52(3)	Sending Notice of Completion of notifiable work in relation to uncompleted work		1,000.00	



<b>Name (and suburb of residence at time of offence)</b>	<b>Licence No.</b>	<b>Legislation and Breach</b>	<b>Offence</b>	<b>Date of Offence</b>	<b>Fine (\$)</b>	<b>Court Costs (\$)</b>
Sarel Kuhn (Terrigal, NSW)	EW151317	E(L)R Regulation 49(1)	Carried out unsafe and substandard electrical work	29/06/09	5,000.00	649.70 *
Voltex Electrical Pty Ltd (Terrigal, NSW)	EC008685	E(L)R 1991 Regulation 52(3)	Sending Notice of Completion of notifiable work in relation to uncompleted work		10,000.00	
Shumgee Anthony Lwoy (Derby)	EC005835	E(L)R 1991 Regulation 51(1) (5 breaches)	Failure to submit a Preliminary Notice within the required timeframe	Between 08/05/06 and 08/08/08	5,000.00 *	649.70
	E(L)R 1991 Regulation 52(1) (5 breaches)	Failed to submit a Notice of Completion within the required timeframe				
	E(L)R 1991 Regulation 52B (6 breaches)	Failed to submit an Electrical Safety Certificate to the relevant client within the required timeframe				
Electricity Networks Corporation T/As Western Power (Perth)		EA 1945, Section 25(1)(a)	Did not maintain their service apparatus in a safe and fit condition for supplying electricity (transposed active and neutral connection)	23/05/09	12,000.00	575.00
Electricity Networks Corporation T/As Western Power (Perth)		E(SS&SS)R 2001 Regulation 10(1)(a)	Failed to operate its network in such a way as to provide for the safety of persons (transposed active and neutral connection)	27/03/09	15,000.00	1495.00

Legend NLH No Licence Held  
EA Electricity Act 1945  
E(L)R Electricity (Licensing) Regulations 1991  
\* Global Fine or Costs issued

# g | a | s

## focus



View of the three gas turbines and four gas engines at Windimurra Vanadium Mine Process Plant

## Windimurra Power Station

The Windimurra Vanadium Mine Process Plant construction was suspended in February 2009 due to the past Global Financial Crisis and the Vanadium price at the time. With renewed funding, the construction of the plant recommenced in February 2011 and is anticipated to be completed in the third quarter of this year. It is being constructed and commissioned by several subcontractors under the project management of the PINC Group.

The Windimurra Power Station is located in the Mid-West region of WA, approximately 80 km south east of Mount Magnet (600 km north-east of Perth). The power station is owned and operated by Midwest Vanadium and is designed to supply the power requirements of the Vanadium Mine, bore-fields and accommodation camp. Vanadium will be mined from reserves that are one of the World's largest. Global demand for

Vanadium is expanding due to the growth in steel consumption and increasing use of alloys used in aerospace applications.

The 23.7 MW power station consists of four 2.4 MW Jenbacher JGS 616 reciprocating engines (19.2 GJ/h natural gas consumption each) and three 4.5 MW Solar Taurus T60 Gas Turbines (56 GJ/h natural gas consumption each at an inlet temperature of 30°C). There is also provision for future heat recovery.

The power station will utilise gas from the North-West shelf delivered through the Mid-West Gas Pipeline takeoff via the Dampier to Bunbury Natural Gas Pipeline.

The Type B gas appliance inspector was Martin Ritchie of BMS Oil and Gas Services and the commissioning gas fitter was Kevin Rhodes of Zenith Pacific Pty Ltd. Zenith Pacific Pty Ltd will operate and maintain the power plant.

## Variation/exemptions, performance based requirements and dispensations information required for compliance badges and plates

EnergySafety has now introduced a numbering system for performance based requirements and dispensations that are granted by the Director. This numbering system is in addition to that for variation/exemptions.

Variation/exemptions will continue to be numbered as previously done with performance based requirements and dispensations now abbreviated and numbered as follows, for example:

- **GVE 11/12:** Denotes a gas variation/exemption number 12, applied for and normally issued in the calendar year 2011.
- **GPBR 11/13:** Denotes a gas performance based requirement number 13, applied for and normally issued in the calendar year 2011.
- **GD 11/09:** Denotes a gas dispensation number nine, applied for and normally issued in the calendar year 2011.

Although there have been few performance based requirements and dispensations issued to date, it has been recognised that a formal means of recording these is required on the compliance badge and/or plate. This is because a gas fitter or inspector coming upon the installation at a later date may not be aware of a performance based

*Continued over page*

*Continued from previous page*

requirement and/or dispensation having been granted.

Generally, requests are received for variation/exemptions and dispensation to Schedule 6 of the Regulations or clause requirements from the standards that are referred to in Schedule 7 of the Regulations. A variation/exemption or dispensation may be granted based on an application demonstrating an equivalent level of compliance and safety from the requirements of Regulation 32(1) of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999.

For further information on applying for a variation/exemption refer to the EnergySafety website [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au).

An application for a variation/exemption needs to be submitted at the design/planning stage, prior to the proposed installation taking place. An application for an existing installation will not be considered for a variation/exemption.

An application for dispensation can only be submitted before completion or alteration of an installation. Dispensation is rarely granted by EnergySafety, however it may be granted where an equivalent level of safety, to that prescribed is provided.

EnergySafety will review the validity of an application for a variation/exemption or dispensation to ensure adherence to the Australian Standard and Australian/New Zealand Standard requirements, wherever possible prior to processing the application. This is of particular relevance for installations that need to comply with the requirements of the joint Australian and New Zealand Standard AS/NZS 5601: Gas Installations.

Generally requests are received for performance based requirements to the joint Australian and New Zealand Standard, AS/NZS 5601, Part 1 or

Part 2. A performance based design requirement may be granted based on an application demonstrating compliance with the requirements of either Part 1 or Part 2, section 2: Performance based design and other requirements.

An application for a performance based design requirement needs to be submitted at the design/planning stage prior to the proposed installation taking place. An application for an existing installation will not be considered for a performance based design requirement.

The gas fitter is to record the variation/exemption(s), dispensation or performance based design requirement issued for any application on the installation compliance badge and/or plate and note in section 8 of the Notice of Completion the variation/exemption(s) and performance based design requirement issued.

## **First performance based requirement for WA**

EnergySafety, in August 2011 granted the first gas performance based requirement in Western Australia. This requirement was in accordance with the joint Australian and New Zealand Standard, AS/NZS 5601: Gas Installations, Part 1: General Installations, section 2: Performance based design and other requirements.

The request for this requirement was in relation to the mechanical ventilation for a proposed gas engine-generator (17.6 GJ/h natural gas consumption) at Building Y of the Fiona Stanley Hospital in Murdoch.

The proposed installation was designed with a mechanical ventilation system delivering a high supply inlet airflow rate for the cooling of the operating gas engine-generator, due to the

large amount of heat expelled. The proposed inlet airflow rate exceeded by five fold the mechanical ventilation requirements of clause 6.4.4.5 of AS/NZS 5601.1 being the 'means of compliance'.

The high-level exhaust openings, at one third the rate of air inlet required, was considered unduly restrictive with the high inlet airflow maintaining a positive pressure in the enclosure at all times while the gas engine-generator is in operation. Safety shut off devices are also to be installed, such as an interlock to shut off gas supply upon failure of the mechanical ventilation system, pressure switches to shut off the appliance if the atmospheric pressure in the enclosure becomes negative and provision of smoke and flame detectors, thermal probes, local alarms and warning signs.

In consideration of the above and assurance from the designer that the proposed mechanical ventilation will be adequate to not adversely affect the operation of the gas-engine generator, maintain ambient temperatures at safe limits in the enclosure, not affect the gas engine-generator manufacturer's warranty and provide an equivalent level of compliance/safety, the performance based requirement was granted.

The gas fitter installing the gas engine-generator is required to record the number of the Performance Based Requirement on the installation's compliance badge and in section 8 of the Notice of Completion form.

Gas industry personnel involved with the installation were the Triple M Group of Companies as the mechanical engineering designer, Lindsay Kier as the Type B gas appliance inspector, Hugh Coyle of ATCO Gas Australia as the installation inspector and Michael Darnborough of Complete Combustion as the gas fitter.

## Recognition of the Polytechnic West Automotive Training Course, LP Gas mobile unloading, decommissioning and scrapping for a Gasfitting Authorisation

EnergySafety has now recognised the Polytechnic West Automotive Training Course, which includes LP Gas mobile unloading, decommissioning and scrapping as forming a suitable prerequisite for the training qualification requirements for a restricted Gasfitting Authorisation in Western Australia.

The decision reached by EnergySafety was based on the apparent need for separate licensing of LP Gas mobile unloading, decommissioning and scrapping operatives, particularly for those working in the auto-recycling and body repairing sides of industry associated with LP Gas mobiles with containers.

Concerns had been expressed about some operatives conducting non-compliant and unsafe practices in the industry, including the removal of seat belts from vehicles to be wrecked, strapping seatbelts around partially loaded containers and tying them to fork lifts or front end loaders, which are then used to wrench the containers from vehicles. Operators were also illegally carting quantities of removed and partially loaded containers to appropriately licensed gas fitters or cylinder test stations for unloading and scrapping.

Gasfitting in WA is a licensed occupation and anyone completing gasfitting work, that does not have the knowledge and skills, could invariably lead to LP Gas leaks and in the worst case, fire or explosion. A person can be infringed \$1,000 for unauthorised gasfitting and for more serious matters, an

investigation conducted and a subsequent successful prosecution can result in a maximum imposed penalty of \$50,000.

The Motor Trades Association of Western Australia (Mark Wyncoll) had initially contacted EnergySafety on behalf of the Automotive Parts Recyclers Association of Western Australia and Polytechnic West, Carlisle Campus, Auto Light, LPG, LNG and CNG Lecturer, Simon Cruise, had undertaken the preparation of such a course.

Prerequisites for trainees undertaking the training course are imposed. These prerequisites include having previous experience in working in the auto-recycling or body repairing industries (minimum of one year), being an employee of such a firm and having practical knowledge of automotive tools with a good level of hand skills. If a registered training organisation assessor feels additional investigation is required of an applicant's suitability, then further theoretical and practical assessment will need to be undertaken.

As part of the training course, Polytechnic West will use their online flexible learning facility with the Moodle Library Resource, which allows staged access

for trainees to modules within the course and has practical institutional assessments.

A person successfully completing the training and assessment, issued with a Completion Certificate will be deemed to have an adequate theoretical and practical knowledge, adequate skills and knowledge of the *Gas Standards Act 1972* and the Regulations required for licensing purposes. The conditions in the schedule for the Authorisation will reflect that any person (supervised gas fitters) working under the Authorisation holder (supervising gas fitter) shall also have completed the course.

An application, including a Completion Certificate may be made to the EnergySafety Licensing Centre for a Gasfitting Authorisation restricted to LP Gas mobile unloading, decommissioning and scrapping.

Polytechnic West is proposing to conduct courses on a three day block basis at their Carlisle Campus. The contact person at Polytechnic West for starting dates and details of courses is Amanda Dowling, phone 9374 6111 on Monday to Wednesday, 9267 7425 on Thursday or email [amanda.dowling@polytechnic.wa.edu.au](mailto:amanda.dowling@polytechnic.wa.edu.au).



*Apparatus in foreground for pumping out LP Gas containers using applied pressure method*

## Would you shell out \$1200 for a gas installation such as this?

In this edition of the Energy Bulletin we have provided photographs of a recent gas installation brought to the attention of EnergySafety. Here is your opportunity to be a gas inspector for a day. Please study the photographs, then list the non-compliances. Besides not submitting a Notice of Completion to the gas supplier, what are the other non-compliances?

### What actions are necessary to correct these non-compliances?

You are invited to send your response to the Chief Gas Inspector, EnergySafety, 303 Sevenoaks street Cannington WA 6107.

The most correct and appropriate response judged by the Gas Inspection Branch may receive a complimentary copy of AS/NZS 5601:2010 parts 1 and 2.



## New approved piping systems

Recent changes to Australian standards AS/NZS 5601: 2010 Clause 4.5 now provide for new proprietary piping systems. In this article EnergySafety is featuring three different piping systems, Viega propass, Rehau and Acu-tech polyethylene.

Each of these piping systems can now be used with confidence, as sufficient fittings and supporting tooling (for crimping/welding) are now available.

### The Viega Propass system

This system enables a copper pipe to be installed without the need to undertake any hot work, such as brazing copper joints. Already gas fitters/plumbers who are using this system are reducing the time for repairs and time on site. There is also less of a hazard when working in confined spaces such as roof spaces and soffits as found in commercial and multi-story buildings.

No longer is there a need to drag the gas cylinders, hoses and torch into such areas. Providing the pipe is clean and the ends cut squarely to accept the crimp fitting, a successful joint is made. All propriety fittings have indicators to show when a successful joint is made ensuring the gas installation is tested and is safe at the conclusion of the work.

### The Rehau Piping system

A product developed by a company responsible for designing and manufacturing the windows on the Airbus aircraft. A composite piping system using crimp fittings for joining that is primarily designed to be used above the ground. Piping can however, be installed below, above or within concrete/screed floors with appropriate protection provided by Rehau. It is simple to use and depending on the diameter can be purchased in convenient

coils or straight lengths of pipe. A vast number of fittings are available including the reversion fittings when required to be installed.

Both the Veiga and the Rehau systems can be used where there is a ban on hot work such as in rural areas with the harvest bans etc.

### Acu-tech

Acu-tech is a locally produced polyethylene piping system used primarily in large commercial and industrial ground installations. Acu-tech provide a large number of fittings to suit all sizes and applications. Primarily the system is designed for electrofusion fittings. Prior to commencing any work with this product it is highly recommended to have all operatives trained in this piping system. This ensures the work undertaken can be recognised with the quality assurance now required on all large jobs.

The fittings are all barcoded to enable automatic recognition for the electrofusion process when using calibrated welders. Training by acu-tech can be provided locally or where necessary trainers provided for remote installations.

With all the above named systems, it is important to have your workforce trained in the use of these piping systems to ensure the work is safe and compliant. Manufacturers of proprietary systems may specify installer competence in addition to competence normally expected of persons doing gas work. Composite pipe (such as Rehau), when installed in a gas installation also requires identification at the gas meter or under the hood of an LP Gas installation.

Regulations require a list of gas fitters with their appropriate training details recorded, to be maintained at the company office.

## Is your gas fitters' register up to date?

EnergySafety gas inspectors are obliged to investigate instances of anonymous reports of non-compliant and/or unauthorised gasfitting. During an investigation it may become apparent that a person who has carried out the gasfitting work did not hold a gasfitting permit. This may lead to the gas inspector visiting the company that employed this person to view the gas fitters' register.

Most companies maintain an updated gas fitters' register, however this is not always the case. Unfortunately this may lead to the company receiving an Infringement Notice. A sample of the Gas fitters' register is shown below.

Under Regulation 7 of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations the information contained in the sample above are the minimum requirements.

It is also important to have any change of address of a registered gas fitter advised in writing to the Director within 14 days of the change. The change of address is important for the services of any notices and including the delivery of the Energy Bulletin.

EnergySafety Gas Inspectors will be visiting the North of Western Australia with a view of encouraging compliance within the gas industry. It would be favourable to ensure your gasfitting employees are registered appropriately.

Sample register

### ***Blackrock Plumbers and Gas fitters Est.1979 Gas fitters' Register (updated 30 June 2011)***

<b><i>Date started</i></b>	<b><i>Name</i></b>	<b><i>Residential address</i></b>	<b><i>Licence Number</i></b>	<b><i>Class/es</i></b>	<b><i>Type of authorisation</i></b>	<b><i>Date Finished</i></b>	<b><i>Expiry Date Permit</i></b>
<i>7 Jan 2006</i>	<i>John Green</i>	<i>96 Lamrock Rd East Perth 6004</i>	<i>GF000560</i>	<i>G, I</i>	<i>Permit (no restrictions)</i>		<i>13 Sep 2011</i>
<i>5 May 2009</i>	<i>Nat Smith</i>	<i>10 Avona Circle Ellenbrook 6078</i>	<i>GF0006348</i>	<i>G</i>	<i>Permit (no restrictions)</i>		<i>4 Feb 2012</i>
<i>9 Aug 2010</i>	<i>Ryan Moss</i>	<i>Lot 7 Weighlan Rd Maida Vale 6019</i>	<i>GF0010579</i>	<i>G</i>	<i>Permit (no restrictions)</i>	<i>5 Feb 2011</i>	
<i>13 Feb 2011</i>	<i>Ian Reynolds</i>	<i>156 Cullis Road Rivervale 6107</i>	<i>GF0011789</i>	<i>G</i>	<i>Permit (Restricted)</i>		<i>17 May 2012</i>

## 'Tube out by others' in new house construction

A Notice of Completion (NOC) is required for all gasfitting work, this includes sections of pipework (tube out) installed in the early part of construction of a new house. It is becoming increasingly apparent that this portion of the work is not being certified.

Subcontractors doing the finishing and commissioning of gas installations cannot mitigate their responsibility by stating in section 8 of the NOC, 'tube out by others'. Also, the use of composite pipe in these instances needs to be badged alongside the compliance badge required for the tube out.

Under the *Gas Standards Act 1972* only permitted gas fitters are able to undertake gas fitting work in Western Australia. The obligation to ensure the gas installation remains safe and compliant rests with all within the gas industry.

To encourage compliance, gas inspectors from both EnergySafety and the gas suppliers will be further evaluating the comments in section 8.



5 TYPE OF WORK					
NEW CONNECTION	<input checked="" type="checkbox"/>	ADDITIONAL WORK	<input type="checkbox"/>	REPAIR WORK	<input type="checkbox"/>
PIPE WORK	<input checked="" type="checkbox"/>	APPLIANCE CONNECTION	<input checked="" type="checkbox"/>	COMMISSIONING	<input checked="" type="checkbox"/>
6 TYPE A (DOMESTIC COMMERCIAL) APPLIANCE(S)			7 TYPE B (INDUSTRIAL) APPLIANCE(S)		
APPLIANCE DESCRIPTION	No.	M/J	Make	DESCRIPTION:	
WATER HEATER	1	SS	West		
COOKING APPLIANCE			W/HOOD		
SPACE HEATER					
BAYONET					
SPA/POOL HEATER					
OTHER					
DETAILS OF OTHER APPLIANCES:					
GAS CONSUMPTION					
PRE-ASSEMBLED <input type="checkbox"/>					
ASSEMBLED ON SITE <input type="checkbox"/>					
CONVERSION <input type="checkbox"/>					
If an appliance is to be left permanently connected, attach Inspector's Certificate of Compliance					
ISSUED BY: INSPECTOR No. <input type="text"/>					
8 COMMENTS AND ADDITIONAL DETAILS (include any applicable variation/exemption numbers)					
Tube out by others.					

Section of Notice of Completion

Both the Compliance badge and the composite pipe label need to be placed in the gas meter box or under the LP Gas hood.

### Variation on minimum clearances to downward surfaces for replacement of gas cooking appliances installed before 1983

EnergySafety, in June 2011, granted a variation to the requirements of clause 6.10.1.1 and Figure 6.3(a) in Part 1 of AS/NZS 5601: Gas Installations, for the replacement of a gas cooking appliance installed before 1983.

The requested variation/exemption was in regard to the minimum clearances from a gas cooker to an overhead downward facing surface. Figure 6.3 (a) specifies that in no case shall the clearance between the highest part of the hob of the gas cooking appliance and any downward facing surface be less than 450 mm.

The Gas Standards Regulations 1983 introduced a requirement for a minimum clearance for a gas cooking appliance to a protected downward facing combustible surface of 450 mm (Clause 601(b) (i)). Installations completed before 1983 may have downward surfaces with a clearance to the cooker of less than 450 mm.

With the pre-1980 appliance rectification programme underway, there have been installations found where the gas cooking appliance clearance to overhead downward facing surfaces is less than 450 mm. In such cases, the replacement appliance was not able to be installed to comply with the current requirements.

It was assessed that with appropriate conditions, any pre-1983 gas cooking installations can be replaced with minimum clearances to downward facing surfaces of 400 mm without impacting on the installation safety.

This variation issued by EnergySafety was for any installed pre-1983 gas cooking appliance to be able to have downward facing surfaces at a minimum of 400 mm instead of the required 450 mm, subject to the following conditions:

- That all other requirements of clause 6.10.1.1 apply.
- The replacement domestic gas cooking appliance has a similar capacity (not exceeding + 10% of existing gas consumption capacity).
- The operating pressure is the same, is a similar type of appliance and has a similar physical size.
- There is no evidence of overheating of existing adjacent surfaces.

Continued over page

Continued from previous page

- Overhanging surfaces are to meet the temperature hazard requirements of AS 4551: Domestic gas cooking appliances, in conjunction with the gas cooking appliance and not exceed a surface temperature of greater than 65°C above ambient.
- There is no practical alternative location available for installation of the replacement gas cooking appliance and any downward facing surfaces.

The variation/exemption number is GV/E 11/13. The generic/global variation document is available on EnergySafety's website [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au).

A registered gas fitter installing a replacement for a gas cooking appliance installed before 1983 must record the information contained on the Notice of Variation/Exemption on each installation's compliance badge.

## Professional development for training organisations

In August EnergySafety hosted a training day for training providers. The focus of the day was Western Australian gasfitting legislation; the *Gas Standards Act 1972* and Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 (Regulations).

There have been a number of changes to the Regulations in the past few years and the training day was an opportunity to keep trainers up-to-date. Competency training and assessment now means there is no pass or fail, the person is deemed either competent or not yet competent. In the case of the Regulations the competency is being able to use the Regulations as a tool. The legislation training and assessment is done under the Occupational Health and Safety (OHS) unit of competency in the Certificate III in Gasfitting or in apprenticeship training. Legislation courses can also be delivered as a separate course for updating gas fitters or to provide an understanding for builders, architects, consultants etc.

Part of the day was used to discuss the various methods of training and assessment and when a student should be deemed competent. Training and assessment will confirm that the student has a working knowledge of the Regulations. The student must understand the responsibilities of the gas fitter, employer, consumer, gas supplier, the administration provisions for obtaining a licence, submitting notices, affixing labels, reporting of incidents etc. Most importantly, for the student who is working to becoming a gas fitter they must be able to use the Regulations as a tool to find what

they are looking for and know how to comply. In the past problems have arisen due to poor or incorrect regulatory interpretation. If an interpretation is required contact EnergySafety.

Also discussed was a draft report on Gas Appliance (Carbon Monoxide) Safety Strategy produced by the Gas Technical Regulators Committee (GTRC) for the consideration of Government. EnergySafety made a significant contribution and drafted the report for the GTRC. In light of two deaths in Victoria from Carbon Monoxide poisoning the GTRC was requested to look into the measures that would help prevent such situations occurring. One of the main points identified in the report was the move to houses becoming increasingly 'air tight' to reduce heat loss. A danger identified in the report, and potentially a contributing factor of the Victorian deaths, is the use of exhaust fans where a conversional flued gas appliance is installed. An exhaust fan in a relatively air tight house can cause a negative pressure and pull the products of combustion back into the room causing dangerous levels of carbon monoxide to build up. Trainers were requested to introduce the topic of reverse flow, due to exhaust fan use, into their technical training.

## Important Notice Certificate of Competency holders

**Now is the time to convert your Certificate of Competency to a Permit prior to National Occupational Licensing.**

For further information view our website at [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au) or contact us by telephone on (08) 9422 5282 or by email at [energylicensing@commerce.wa.gov.au](mailto:energylicensing@commerce.wa.gov.au)