

eNERGY bulletin



Government of Western Australia
Department of Mines, Industry Regulation and Safety
Energy Safety

In this issue

High fire potential prompts advice for bushfire season

With a higher than normal fire potential predicted for parts of the State this bushfire season, EnergySafety is urging Western Australians to ensure that gas and electrical installations on their property are safe and in good working order.

Poorly maintained or damaged private power poles or power lines may increase the risk of fire or electrical hazard resulting in serious risks to people and property.

Consumers should conduct a visual inspection of their private power poles and lines once a year and after severe weather events to ensure there are no signs of deterioration. Vegetation should be cleared from around the base of power poles and be at least two metres clear of power lines.

Power lines that transport electricity from the main switchboard and meter to a consumers' home are private power lines. This includes the pole where the network operator's overhead service cable is attached. If a consumer has private power lines or poles on their property it is their responsibility to maintain them. The network operator should be contacted if the consumer is unsure if the power lines or poles are their responsibility.

45kg domestic LP Gas cylinders are used widely throughout bushfire prone areas, however they do not pose a significant

additional risk during bushfires, as long as they are correctly installed and maintained.

They should be installed outside buildings on a firm, level and non-combustible base and secured to a solid structure. The cylinders should be clear of any combustible materials and the safety valves should be positioned so they point away from adjacent structures and cylinders.

LP Gas cylinders should also be checked to ensure there is no damage, such as dents and gouges that will affect the cylinders' integrity.

When visiting a consumer's property, please advise them to check any private power poles and lines and LP Gas cylinders ahead of the bushfire season.

The *Guidelines for the Safe Management of private power poles and lines* as well as further information on vegetation control and LP Gas cylinders can be found on www.energysafety.wa.gov.au.

Ken Bowron
DIRECTOR OF ENERGY SAFETY

- High fire potential prompts advice for bushfire season..... 1
- EnergySafety Gas Retirements.....2
- Western Power ETIC update3
- The new Wiring Rules - your sneak preview4
- NECA AS/NZS 3000 Roadshows ...4
- Transposition and failure to support a concrete pole4
- Penalties for workplace safety breaches to increase.....5
- Maximum demand re-calculation5
- Your technical questions answered6
- BESS powering scientists explorations of our southern skies.....9
- Horizon Power wins national recognition for innovation9
- 2017 Regional World Skills Competition 10
- Report damage to Horizon Power mini pillars..... 10
- EnergySafety's Electricity Compliance Directorate - what we do 11
- Too many injuries arising from unmonitored wall chasing practices..... 11
- Garden Island microgrid soon operational..... 12
- Work carried out on mine sites - submission of notices..... 12
- Keep up to date with your standards 12
- Product Recalls 13
- Network operator contacts 13
- Is your worker an employee or sub-contractor?..... 13
- Interview with David Perlini - winner of a NECA WA Excellence Award 14
- What's wrong with these installations? 15
- Switchboard fire protection sealing.....17
- Serious defects - 1 July to 30 September 2017 18
- Prosecutions for breaches of electricity legislation.....21
- Composite piping installation..... 22
- Flue installation for Type B appliances 25
- Servicing Type B appliances..... 26
- Summary of infringements for breaches of gas legislation..... 28

EnergySafety Gas Retirements

EnergySafety would like to acknowledge and thank two well respected and long standing staff members who have recently retired.

Kevin Hooper

After 46 years in the gas industry, Chief Gas Inspector Kevin Hooper will officially retire in December 2017, after taking extended leave. Kevin started in the gas industry as a drafting assistant at the State Energy Commission (SEC) Gas Works. While at the SEC he also worked in the gas sales office and acted as an Installation foreman supervising SEC gas fitters in installing domestic and commercial gas installations in the CBD and surrounding areas. A formal Gas Inspection team was established in 1980 and Kevin, along with two others, was responsible for undertaking inspection duties under the Gas Standards Act 1972 and later the Gas Standard Regulations 1983.

When Natural Gas supplies became available to WA via the North West and the Dampier Bunbury Natural Gas Pipeline, Kevin was responsible for all areas north of Perth. This included training of contractors to install gas installations and conducting inspections of converted diesel to natural gas burning equipment. Kevin provided the training to plumbers working for the Geraldton Building Company and set up training facilities at the Geraldton TAFE.

It was recognised that there was a need to enhance gas fitter training in WA, so Leederville TAFE engaged Kevin to run a night school course on gas fitting and servicing throughout 1989.



Kevin Hooper

With the breakup of SECWA in 1994, Kevin decided to take up a position in the Public Service in the newly created Office of Energy from 1 January 1995.

On 1 April 2008, Kevin was officially appointed to the position of Chief Gas Inspector.

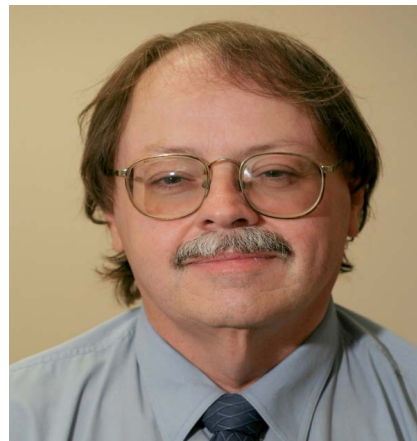
Kevin has managed a closely knit team who are responsible for maintaining a safe and compliant gas network and consumer gas installations.

David Robertson

After 10 years of dedicated service, David Robertson has also retired.

David graduated from Monash University with a Bachelor of Engineering with Honours. He worked at Gas and Fuel Corporation in Victoria and Tasmania Hydro before moving to Western Australia and joining Alinta in 1996, where he worked in a research lab in Bentley as an Application Engineer completing energy audits.

In 2008, he joined EnergySafety, as the Principal Engineer Utilisation where he has participated on the Gas Licensing Committee, Australian Standards AG006 and AG011 committees.



David Robertson

David's knowledge of industrial gas burning equipment is widely respected throughout the industry and his general scientific and engineering knowledge is remarkable.

EnergySafety would like to thank Kevin and David for their years of service and to wish them all the best in their retirement.

To fill the vacated positions, Michael Newbold will be Acting Chief Gas Inspector; Carl Deimel will be acting Manager Gas Inspection and Anthony Smith will be Acting Principal Engineer Utilisation, until the positions are advertised and filled permanently.

Western Power ETIC update

Western Power is developing an IT system that will integrate with EnergySafety's eNotice. Once the new system is up and running, ETIC will be shut down.

Western Power will be in touch in the coming months to let you know when ETIC will no longer accept Preliminary Notices, and the final shut down date. In the meantime, we encourage you to prepare for the transition to EnergySafety's eNotice for Notice submission.

After the change, you will need to lodge notices in EnergySafety's eNotice system, not Western Power's ETIC.

Service requests

Western Power has also been focussing on improving its service to Electrical Contractors. A new set of forms has been developed (in consultation with industry) to make it easier to request a service after submitting an eNotice. The new forms will replace the current Online Network Service Request forms and are simple and straight forward to use. They will also save time by automatically populating information from EnergySafety's eNotice.

If you currently lodge Notices in Western Power's ETIC and would like further information, please contact Western Power 13 10 87 or energise.admin@westernpower.com.au.

The new Wiring Rules – your sneak preview

Changes in the soon-to-be-released Wiring Rules will increase the coverage of RCD protected circuits. Some of the changes to be introduced are listed below.

Cables - mechanical protection

Comprehensive requirements will be introduced for the mechanical protection of cables located in areas within ceiling spaces where they are at risk of physical damage.

Residual current devices (RCDs)

- Domestic installations - while the existing requirement of a maximum of three circuits per RCD and minimum of two RCDs remain, RCDs will be required on **all** final sub-circuits in domestic installations including fixed electrical equipment (e.g. cooktops, hot water systems and air-conditioning units).
- Non-domestic installations –
 - 30mA RCDs **must be** installed on:
 - all lighting and socket outlet final sub-circuits less than, or equal to 32A;
 - all final sub-circuits less than, or equal to 32A supplying fixed wired electrical equipment; and
 - all final sub-circuits supplying fixed wired electrical equipment which puts persons at a greater risk of receiving an electric shock due to the type of the installation, functions performed and the installation location (i.e. wet areas).
- Electrical medical equipment - RCDs installed for electrical medical equipment in home care requires compliance with AS/NZS 3003: 2011, Electrical installations - Patient Areas.

Segregation of different electrical installations

The installation of conductors in the same pipe, tube, conduit or the same multi-core cable if they form part of different electrical installations will not be permitted. This includes conductors forming part of individual occupancies or single/multiple electrical installations.

Sleeving conductors

In installations where alterations or repairs are being carried out and new junctions/terminations to existing bare or green earth conductors are required, conductors **must** be sleeved with green/yellow sleeving at each of the new cable junctions/terminations.

NECA AS/NZS 3000 Roadshows

A series of NECA seminars highlighting the new AS/NZS 3000, which is due for imminent release is currently making its way through Western Australia.

The Wiring Rules Information Session Roadshow presented by the National Electrical and Communications Association (NECA) WA, commenced in Geraldton on 17 August 2017 and has been making its way through Perth metropolitan suburbs and regional towns in Western Australia (as far north as Kununurra).

For further information, please visit the NECA WA website www.neca.asn.au.

Transposition and failure to support a concrete pole

A contractor engaged by Western Power to carry out work associated with their Overhead Customer Service Connection Project, in Spalding, transposed the active phase and neutral conductor of an overhead service mains cable. This resulted in consumers receiving electric shocks.

The cable connected two domestic units and residents from each received electric shocks while touching the shower taps. The earthing system for the installation and any earthed parts of the installation became live up to a potential of 230 V ac.

Western Power was fined \$55,000 with court costs of \$742.50, for failing to identify this serious transposition error during the checking and testing of the installation.

The network operator was also fined \$60,000 with court costs of \$742.50 for not following set procedures after failing to provide adequate support for a concrete pole while work was being carried out near its base.

The pole fell over while excavation work was carried out near its base, causing extensive damage to the fence and patio of a neighbouring property (shown below) and an underground water main pipe.



Fallen pole and conductors causing damage to the fence and patio



Burn marks on the fence cap

The impact also caused two bays of overhead live conductors (HV and LV) and associated supporting equipment to be pulled out from adjacent poles. The overhead service mains cables of two neighbouring properties were also pulled out of the connection terminals at the mains connection boxes.

The incident left residents in the immediate area without electricity and water for almost eighteen hours after the incident.

Penalties for workplace safety breaches to increase

The Western Australian government is proposing to increase penalties for breaches of the *Occupational Health and Safety Act 1984*.

Penalties have remained unchanged since 2004. The increase is seen by the government as justified to better align Western Australia with the penalties dispensed by other states and territories who have adopted the national *Model Work Health and Safety Act*.

The new penalties will be in effect prior to the introduction of the Work Health and Safety Bill in parliament come 2019 and are expected to be a significant deterrent to employers and employees against non-compliances with workplace health and safety laws.

Maximum demand re-calculation – alterations and additions

Care needs to be taken whenever additional circuits or equipment are to be added to an existing electrical installation. Electrical contractors must carry out a fresh maximum demand calculation to reflect the circumstances once the new load is connected and operating (Clauses 1.6.3 and 2.2.2 of Wiring Rules). They must ensure the installation is still safe and complies with the Standards and legislation.

This is particularly important when new loads such as high-current socket outlets, air conditioners, pool pumps, stoves, wall ovens and, more recently, electric vehicle chargers are added to residential and small commercial installations.

Appendix C of the Wiring Rules provides useful guidance for calculating maximum demand.

Electric vehicle chargers are beginning to appear as accepted household and business equipment. They usually are single-phase units, drawing heavy currents (up to 40 Amperes) and may need several hours to complete a vehicle charge.

Chargers may be supplied from a high current socket outlet, typically rated from 15 to 50 Amperes. An electrical contractor may simply be asked to install such a socket outlet and may not know what equipment it will supply. Contractors should always 'play it safe' by assuming a high-current socket outlet will have zero diversity at its rated current.

Where installing work involves only a single final sub-circuit, a Notice of Completion is not required to be submitted to the network operator. However, if a 40 Ampere socket outlet was to be installed in a domestic installation, for example, it is highly likely that the supply arrangement and service equipment would need to be upgraded or the customer's maximum demand limited by a circuit breaker main switch (Clause 2.2.2 of Wiring Rules).

Additionally, some electric vehicles and their associated chargers may have a car-to-grid export capability, requiring modification to the customer electrical installation, metering equipment and supply arrangement. For this reason electrical contractors should always submit notices whenever installing these chargers or special large-current socket outlets.

Installation considerations

In each case the new maximum demand must be calculated to check that it does not exceed the current-carrying capacity of the installation's consumer's mains, service protection device, main switch and metering equipment. Notices are required should this equipment be altered or modified.

Voltage drop and rise must also be calculated to check they are within required limits.

Supply arrangement considerations

Electrical contractors must also consider the upper current limits set by network operators. Common load limits for metropolitan domestic installations are 32 Amperes per phase for three-phase installations and 63 Amperes per phase for single-phase. Network operator aerial supply cables generally are sized for these currents. Other limits may apply in certain locations, especially in regional areas.

For underground supplies, mini-pillars are rated at 120 Amperes per phase and can cater for up to four connections. This typically equates to a supply of at approximately 63 Amperes single phase, for each connection, where normal diversity factors can be applied.

If the capacity of the network supply is not known, contractors should contact the network operator.

Should the customer elect to upgrade the supply arrangement, this must be completed before the socket

outlet is installed. Upgrading the network operator's supply may take considerable time and so a preliminary notice should be submitted to the network operator as soon as possible.

Checklist for installing new hard-wired equipment in existing installations

1. Determine the full-load current and duty cycle of equipment.
2. Calculate revised maximum demand for the whole of the installation.
3. Check current rating of consumers mains. Service Protection Device and main switch are adequate.
4. Check voltage drop and rise are within required limits.
5. If maximum demand exceeds the network operator's maximum connection capacity or the metering equipment needs to be upgraded contact the network operator before proceeding.
6. Submit a Preliminary Notice to the network operator.
7. Complete the work and test to ensure it complies with the regulations and the network operator's requirements.
8. Submit a Notice of Completion.

Your technical questions answered

Q: Are there any mandatory requirements for retraining personnel who have previously undertaken high voltage switching operator training?

A: While there are no mandatory requirements for retraining personnel who have previously undertaken high voltage switching operator training, Section 4.2 of the *Guidelines for the Safe Management of High Voltage Electrical Installations* states that HV switches should only be operated by persons selected, trained and authorised by the responsible person, and where required, by the network operator.

Switching operators should be trained and regularly assessed to be competent by a registered training organisation (RTO) to perform their given roles as well as maintaining currency in units of switching, featured in Industry Training Packages delivered by a RTO approved to deliver Nationally Recognised Training within the Australian Qualifications Framework.

Q: I am carrying out electrical work on a motor home to ensure it meets requirements. What standard/s should I be referring to and what paper work is required to be completed for this job?

A: You should be using AS/NZS 3000: 2007, Wiring Rules and AS/NZS 3001: 2008, Electrical installations - Transportable structures and vehicles including their site supplies to ensure the motor home meets electrical safety requirements. Preliminary Notices and Notices of Completion are to be submitted to the relevant network operator who will be supplying the motor home with electricity. If the network operator is unknown, the notices are to be submitted to EnergySafety.

Q: Which standard/s should I be using for the installation of an electric fence on a rural property?

A: Guidance on installing an electric fence can be found in Clause 7.8.4.3 of AS/NZS 3000: 2007, Wiring Rules. This Clause directs you to AS/NZS 3014: 2003, Electrical installations – Electric fences and AS/NZS 3016: 2002, Electrical installations – Electric Security fences and for the installation of a mains-operated controller, AS/NZS 60335.2.76: 2003, Household and Similar Electrical Appliances - Safety Particular requirements for electric fence energizers.

You should also check that the electric fence energizer has the required approval marking and certificate of compliance to ensure it meets the requirements of Australian safety standards.

The installation of electric fences must also meet any local government requirements.

Q: I am an electrical contractor and I have installed a final sub-circuit for a new split system air-conditioner and an isolator at the site of the new air-conditioner outside. Can the supplier/installer of the air-conditioner wire from the isolator to the air-conditioner if he holds a Restricted Electrical Licence?

A: No. As per Regulation 21 of the Electricity (Licensing) Regulations 1991, a restricted licence does not authorise the holder of the licence to carry out the installation or alteration of fixed wiring.

A Restricted Licence authorises the holder of the licence to carry out electrical work (including testing) associated with or for the purposes of the holder's trade or calling. They are only authorised to carry out work in accordance to the scope of their licence provisions.

Q: Does an electrician working on equipment in a service station require a special licence or permit to carry out electrical work?

A: No. While workers are not required to hold a specific licence to carry out electrical work on equipment in a petrol service station (e.g. fuel bowsers etc), the person carrying out the work should be deemed competent by

their employer for carrying out the specialised work in a hazardous area.

Q: In Energy Bulletin Issue No. 78 (April 2017) there was an article on CPR training where it stated the following: "All electrical workers and their assistants should possess current first aid and resuscitation skills. This training is very important and no person should need to ask if this is mandatory. Given the serious hazards of working with electricity, EnergySafety encourages electricians trained in first aid and resuscitation, to undertake refresher training of these lifesaving procedures at least once a year". Should the employee or employer cover the costs for training?

A: As to whom should cover the costs involved with CPR training, is not covered by legislation administered by EnergySafety. It is recommended that the costs involved with training be negotiated between the employer and employee, however, it is in the employer's best interests to provide a safe working environment for employees and have someone suitably trained to handle emergency situations where first aid may be required to be administered.

Q: I saw an article on an electrical industry website which suggests barrier manufacturers' need only nominate the general size and type of downlight and self-assess the barrier is compliant as a generic type. AS/NZS 5110:2011, Recessed luminaire barriers - Amendment 1, Section 2.8.3 does not contain the testing requirement stated in Sections 2.8.1 and 2.8.2. It seems that barrier manufacturers' are operating on the principle that a barrier they assess as being generic is not required to be tested as per the relevant standards.

The problem for any competent person inspecting an existing installation is that they don't necessarily get to see the manufacturer's instructions or technical information, particularly for older minimally constructed halogen recessed downlights.

A competent person cannot gauge if a barrier is compliant or not given they cannot test the IP rating of a downlight or barrier, or impact resistance, or ventilation, or fire resistance. How is a competent person supposed to identify compliance of any given barrier, when almost none of them are labelled, or labelled with appropriate compliance information?

A: The ultimate responsibility for selecting and correctly installing downlights and complying barriers rests with the electrical contractor and their employed electricians, who

must comply with AS/NZS 3000:2007, Wiring Rules, Clause 4.5.2.3.

It is very difficult to determine by visual inspection whether a luminaire barrier complies with AS/NZS 5110:2011, Recessed luminaire barriers. Barriers are not a prescribed item and are not required to bear the regulatory compliance mark.

Under Clause 4.5.2.3.3(e), electricians have a choice of means for securing in position and maintaining clearances to comply. To ensure compliance, the simplest option is to check the clearance distance meets Figure 4.7.

Q: I have come across an installation that has Vulcanised Indian Rubber (VIR). Is this wiring illegal? If so, where would I find mention of this in the Wiring Rules or WA Electrical Requirements?

A: VIR was widely used in the 1940s and 1950s for the wiring of houses. Over time, the rubber insulation of the wiring deteriorates leaving live copper conductors exposed which leaves persons entering the roof space vulnerable to receiving a potentially fatal electric shock.

Through newspaper advertisements, EnergySafety attempted to encourage owners of domestic premises built before 1960, to engage an electrical contractor to have the wiring inspected to see whether VIR or TRS (tough rubber sheathed) wiring was present.

VIR has exceeded its serviceable life and therefore, is considered defective and unsafe.

Under Regulation 62 of the Electricity (Licensing) Regulations 1991, the network operator must be notified as soon as practicable as an installation containing this wiring is considered defective and unsafe. An Inspector will then be dispatched to inspect the installation and issue an Inspector's Order for the defect to be rectified.

Q: Why consumers mains cannot be of a flexible cable type permitted under AS/NZS 3008 and manufactured to AS/NZS 5000. I have a situation where a contractor is installing a new metering switchboard where the space to connect the mains supply to the main switch will prove awkward using XLPE conductors.

For a satisfactory installation, could the contractor join the existing supply XLPE conductors with a flexible cable to allow a safe method of connection to the main switch terminals?

We are concerned the tension of the bends from the underground consumers mains cables may over

time put a high tension loading on the terminals hence the use of a comparable flexible (tails) cable could alleviate this anticipated risk.

The short lengths of flexible cable would be joined by crimp sleeve specifically designed to join the XLPE and flexible cables and insulated at the join with an equivalent cable with heat shrink properties as the original cable.

A: Clause 9.10 of the WA Electrical Requirements stipulates that joints in consumers mains are to be avoided wherever possible. Switchboards should be designed so that the cable can be properly terminated.

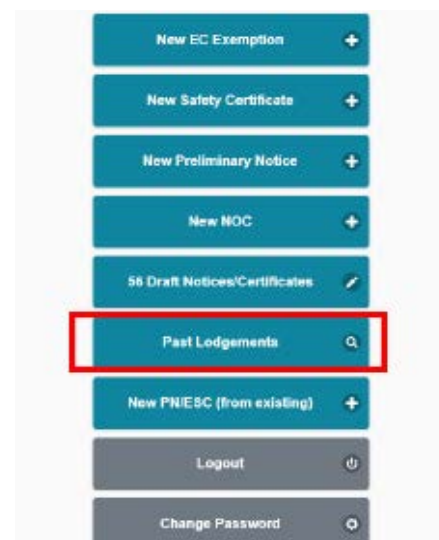
Q: An employee at the mine site I work at has received an electric shock. To whom should I be reporting this incident?

A: To report an electric shock or accident that has occurred at a mine site connected to a network operator's grid, you are required to report it to the network operator directly. For mine sites where the network operator is unknown, electric shock and accidents are required to be reported to EnergySafety.

Q: I need to change the installation address of an eNotice I recently submitted. How do I do this?

A: To amend the installation address on an eNotice, please follow these easy steps below

1. Log into eNotice. Select **Past Lodgements** on your homepage.



2. Input any of the relevant details for the Notice to find it directly. Alternatively, click on **Search** for a list of all the notices and Electrical Safety Certificates that have been submitted under the electrical contractor's licence.

To the right of the notice you wish to amend, you will find the icon to AMEND

Click once to amend the Notice.



A pop up box will appear asking you to confirm whether you wish to amend the notice. Click once on **Yes**.

Amend?

Yes

No

3. On the next page you will be asked to select a reason for amendment. Click on the radio button next to **Correction of installation address/customer details** then click **Next**

Lodged Notices of Completion are legal documents. However, an Electrical Contractor may need to legitimately amend a Notice of Completion in some circumstances to ensure compliance.

Reason for amendment?

- Correction of compliance statements
- Correction of date of completion of work
- Correction of electrical worker details
- Correction of installation address / customer details
- Correction of installation type / details
- Correction of meter number / retailer reference
- Correction of network operator attendance
- Correction of network operator reference
- Created in error
- Duplicate (please provide other notice number)
- Other

If OTHER, please provide description

Comments

4. The next page will display all Notice details. Go to **Location of Installation** and click on the icon to **AMEND**.

The next page will contain the location details of the installation where you can make the changes.



BESS powering scientists explorations of our southern skies

Energy Made Clean, a subsidiary of renewable technology innovator Carnegie Clean Energy has recently delivered Australia's largest battery energy storage system (BESS) to CSIRO's Murchison Radio-astronomy Observatory.

A 2.6 MWh battery energy storage system (BESS) will be integrated with the 1.6MW solar array and existing diesel generated power station to operate the Australia Square Kilometer Array Pathfinder (ASKAP) project.

The batteries and PV central inverters have been built in custom-designed EMI shielded containers for ease of delivery and installation.



Aerial view of the solar array and BESS at site
(Source: Carnegie Clean Energy)

The Square Kilometer Array Pathfinder project situated on the grounds of Boolardy Station in the Murchison region, is on its way to being the world's most advanced radio-telescope; allowing astronomers to probe deeper into the southern hemisphere.

Horizon Power wins national recognition for innovation

This year's Clean Energy Council Innovation Award presented by the Clean Energy Council on 19 July 2017 during the Australian Clean Energy Summit in Sydney was shared by Horizon Power for the 'Power Ahead Research' pilot and Victorian network operator AusNet Services who teamed up with Greensync and PowerTec to deliver a community mini-grid.

Horizon Power won for their innovative 'Power Ahead Research' pilot which received participation from over four hundred consumers, both residents and business owners, in the Port Hedland area.

The pilot enabled the network operator to trial various methods of consumer electricity usage and bill management to see how consumers would modify their behaviours to use less electricity to meet set targets.

Pilot participants were given financial incentives in the form of bill credits for not exceeding their electricity consumption allowance during the peak periods (1-8pm) of the summer of 2016/2017. Electricity usage during this period was managed with a smart phone app to assist participants in meeting this target.

97% percent of the participants were successful with the objective and received bill credits of between \$300 to \$3200.

Findings from the pilot included an 84% reduction in electricity consumption by residential customers with 85% willing to keep with their modified usage practices for the forthcoming summers.

Given these promising findings, Horizon Power is in discussions with the Western Australian government to introduce a new system for electricity billing, which is expected be more sustainable and equitable option for consumers.

2017 Regional World Skills Competition

On 9 August 2017, EnergySafety's Chief Electrical Inspector Compliance Todd Bell attended the 2017 Western Australian Regional Worldskills Competition at the College of Electrical Training (CET) in Jandakot in the role of Chief Judge.

CET instructors Peter Marshall and Greg Morgan made up the rest of the judging panel for the Construction & Building Technology - Electrical Installations category.

Third and fourth year electrical apprentices were given six hours to display their skillsets by completing a wiring project in a simulated work environment. The project consisted of tasks including the installation of a switchboard and all its associated circuit protection, two-way lighting and power motor control circuits.



Chief Judge Todd Bell monitoring the progress of electrical apprentice Jacob Harding

Seven apprentices participated in this year's event where they were judged on criteria including circuit function, dimensions and mounting, installation of wiring, wiring and connection and safety.

The apprentices were ranked against other electrical apprentices nationwide for the opportunity to compete in the 2018 WorldSkills National Championship which will be held at the Convention Centre in Darling Harbour, Sydney between 29 May and 7 June 2018.

The competition, which is held every two years, offers apprentices benefits such as demonstrating potential to current and future employers, enhancing workplace skills and performance and developing time management and organisational skills.

Further information on WorldSkills Australia can be found at their website www.worldskills.org.au.

Report damage to Horizon Power mini pillars

Electricians working in areas supplied by Horizon Power are urged to contact the network operator immediately to report any identified damage to green mini-pillars (green domes).

This year alone, Horizon Power has received close to seventy incidents involving damage to the underground network, with the greatest proportion of incidents occurring in the towns in the far north of Western Australia; Port Hedland, Karratha and Broome.

Most often, damage to mini pillars is caused by the impact with people driving into or over the domes, or damaging them using heavy duty lawn mowing equipment.

Damaged mini pillars, when left unreported, pose a serious danger to the community with children being most vulnerable given their lack of awareness regarding the dangers associated with electricity.

A person making contact with the damaged wiring and exposed cables is at risk of receiving an electric shock or electrocution.

To help keep the community safe, please contact Horizon Power on 13 23 51 to report any damage to network infrastructure.

EnergySafety's Electricity Compliance Directorate – what we do

As an electrician, you know that EnergySafety is the regulator of electricity and gas technical safety regulations in Western Australia and the issuer of licences and permits to electrical contractors, electricians and apprentices, but are you aware of our history and the specific activities we undertake?

Our team at the Electricity Compliance Directorate work hard every day in the interests of keeping the community and those involved in the industry safe from the well-known hazards involved with electricity. This is what we do:

- Inspect electrical work undertaken by electricians offshore (Rottneest, Christmas and Cocos (Keeling) Islands).
- Audit for compliance to the Electricity (Licensing) Regulations 1991.
- Inspect domestic properties for rent or sale to ensure compliance with RCD requirements.
- Investigate serious accidents and fatalities attributed to electricity.
- Audits of network operators to ensure compliance with their Inspection System Plans.
- Investigate network incidents which have resulted in a notifiable incident.
- Designate electricians/engineers as Electrical Inspectors.
- Analyse data received on electric shocks and accidents reported by consumers and electricians to determine deficiencies in industry work practices.

- Prepare industry legislation, Codes of Practice and Guidelines.
- Inspect appliances that consumers have reported as being unsafe to use.
- Provide technical advice and support.
- Investigate breaches of electricity related Acts and their associated Regulations (consumer installations and for network operators').
- Issuing of exemptions from the submission of Preliminary Notices and Notices of Completion.
- Dispense technical advice to consumers and licensed operatives on any of the legislation administered by EnergySafety (please note, we do not provide rulings. You need to contact the relevant network operator if the ruling required involves an installation connected to the network operator grid).
- Conduct notice inspections of commercial, domestic, industrial, construction/demolition, mining and rural sites, as well as marine craft and transportable units.

Too many injuries arising from unmonitored wall chasing practices

Due to the high number of non-compliances identified with wall chasing work and resulting injuries, WorkSafe Western Australia has issued a bulletin to improve safety conditions on construction sites.

The bulletin, released on 13 June 2017 details potential risks to those doing wall chasing and workers in the immediate vicinity of where such work is carried out:

- 1. Carbon monoxide** - exposure to harmful levels from petrol powered saws. This can cause harmful side effects including weakness, tiredness, nausea, headache or collapse with permanent heart damage on the more serious side.
- 2. Slurry** - the residue from wet cutting leaves workers at risk of injuries from slipping. While dry, inhaling silica dust could lead to serious lung conditions including chronic bronchitis, silicosis (scarring to the lungs leading to breathing difficulties), kidney damage, scleroderma and even lung cancer.
- 3. Improper saw usage** - operating the saw above shoulder height or with only one hand can result in shoulder injuries or kick back.

Electrical contractors who may employ trade assistants to carry out wall chasing work are advised to have a detailed policy for wall chasing practices in place and that their employees adhere to it all times.

The policy could include some of the following recommendations:

- Ensuring correct selection and usage of saws.
- Limiting usage of petrol powered saws to outdoors or well ventilated areas.
- Removing slurry on completion of tasks.
- Using appropriate PPE equipment.
- Documentation of risks and controls in Safe Work Method Statements.
- Using work platforms for out of reach areas.

To download the bulletin, visit WorkSafe's website www.dmirs.wa.gov.au/worksafe.

Garden Island microgrid soon operational

Construction is underway on Carnegie Clean Energy's Garden Island Microgrid Project with the occasion marked with a sod-turning ceremony attended by the Minister for the Environment and Energy, Hon. Joshua Frydenberg.

The project, first mentioned in Energy Bulletin 77, when complete will be a world first as it combines the seamless transfer between two modes of operation; both on and off grid. Integrated into the Perth Wave Energy's existing desalination plant, diesel generators and Western Power grid supply will be a 2 MW solar photovoltaic (PV) array, 2 MWh battery energy storage system (BESS) and CETO 6 wave energy and desalination technology.

The microgrid has been commissioned by the Department of Defence to supply their HMAS Stirling Naval Base with a reliable electricity supply and fresh water.

The installation of the solar and BESS components of the microgrid is expected to be completed by the end of the year.

Work carried out on mine sites – submission of notices

EnergySafety often receives queries from electrical contractors who are carrying out work on mine sites, as to whether they are required to submit Notices. Since 2011 when 'minor work' was phased out and amendments made to the Regulations as to what work is considered notifiable, Preliminary Notices and Notices of Completion were no longer required to be submitted for certain work carried out on mine sites.

As per Regulation 52(2AA), notices for electrical installing work on a mine site **are** required to be submitted to the relevant network operator for work including:

- An initial connection made to transmission or distribution works or a private generating plant.
- An alteration to a main switchboard.
- An alteration to service apparatus or transmission or distribution works.
- The installation or removal of a private generating plant.
- The alteration of the capacity of a private generating plant.

However, all work must be recorded in the mine site electrical log book.

Keep up to date with your standards

Be in the know! Keep informed and know when the standards you regularly use have been updated by registering online with Standardwatch, offered by SAI Global infostore.saiglobal.com. Other subscriber benefits include standard discounts and selection preference on the industry information you receive.

Product recalls

Aerocool Australia New Zealand Pty Ltd - Aerocool Power Boards

A recall was issued on 25 August 2017 for the affected models with reference numbers:

- ACAS-SS2A25A;
- ACAS-ST1A4U2;
- ACAS-SA4A3U2;
- ACAS-QA6A3U2; and
- ACAS-QA8A3U2

with approval numbers:

- SAA162701-EA;
- SAA170332-EA;
- SAA170333-EA.

The products were sold nationally by Officeworks (in store and online) between 17 April and 28 July 2017.



Aerocool Australia New Zealand Pty Ltd - Aerocool power boards

Consumers are at risk of receiving an electric shock or damage to their property

Contact

Telephone: 0428 987 683

Email: aerocoolaustralia@gmail.com

Is your worker an employee or sub-contractor?

Labour Relations' Wageline has recently released a fact sheet (available to download at www.dmirs.wa.gov.au/labour-relations) highlighting differences between employee and subcontractor roles.

This fact sheet is recommended to electrical contractors working under the state industrial relations system (i.e. sole traders, partnerships and unincorporated trusts).

Not knowing the difference between these roles may prove to be a costly dilemma for you if a worker, legally viewed as an employee, has been engaged as a subcontractor. If not informed, you may unexpectedly find the worker may be entitled to employee benefits including unpaid leave, wages (including overtime and penalty rates) and superannuation contributions.

To assist employees in the sometimes difficult task of differentiating between the two working arrangements, a checklist designed around the key elements of each role is included in the fact sheet.

For further advice on pay rates, leave entitlements, record keeping requirements and other employment arrangements contact Wageline on 1300 655 266.

Network operator contacts

The current contact numbers for Western Australian network operators are listed below. Please note the addition of Indian Ocean Territories Power Service.

| Network operator | Reporting electric shock/ accidents | General queries |
|--|-------------------------------------|-------------------------|
| BHP Billiton Newman | 1300 632 483 - Option 4 | 1300 632 483 - Option 1 |
| BHP Billiton Nickel West | 9026 5262 | 9026 5262 |
| Horizon Power | 13 23 51 | 13 23 51 |
| Rio Tinto | 1800 992 777 | 1800 992 777 |
| Western Power | 13 13 51 | 13 10 87 |
| Indian Ocean Territories Power Service (IOTPS) (for Christmas and Cocos (Keeling) Islands) | 9164 7111 | 9164 7111 |

Interview with David Perlini – winner of a NECA WA Excellence Award

EnergySafety recently interviewed David Perlini, Director of Insight Electrical Technology Pty Ltd on his recent win at the NECA WA Excellence Awards.

David has over twenty years experience in the electrical industry and has worked in various positions, including a management role for fifteen years.

After starting his electrical contracting business over ten years ago, David has developed a great understanding of contract management.

With a strong determination to meet and exceed customer requirements, David is dedicated to continual improvement and is constantly looking for new ways to improve business systems.

Q1: Congratulations on winning NECA's Excellence Award – Work Health Safety Management System (Company). Please tell our readers about the work undertaken by your company on this project.

A: Insight Electrical Technology entered into this work health safety (WHS) drive when the demand for safety management systems and processes became a requirement for the projects we intended on pursuing in the future.

We found we were being 'force fed' WHS based on what each client wanted, rather than what we required. As a result, our policy and procedures were changing based on clients' needs, rather than our own.

Having identified the need to develop our own rigorous WHS system, we set out to create a system that would provide us with the level of safety we required that primarily placed the responsibility for adherence to the system on the employees.

By developing a solid system that has engaged employees and provided management with the information required, we have seen significant measurable WHS performance improvements for our company.

We have created a dynamic system that engages our employees and provides our management team with the information they need to ensure risks are being dealt with

according to company policies and procedures.

The system involves:

- an online access platform;
- a cloud based portal;
- analytical databases;
- automated flagging of staff training requirements;
- real time synchronization of documents; and
- automated sorting of documents based of job type or number.

When developing this system, it was vitally important that we did not create something that would inhibit the business from achieving success, but still provided the assurance needed by management.



The team from Insight Electrical Technology Pty Ltd celebrating their win at the awards night

Q2: How did your nomination for a NECA Excellence Award come about and why was your company selected as the category winner?

A: After implementing the system some three to four years ago and working closely with NECA in the development of the system, we believed our improvements were considerable and worthy of nomination for this award.

We were selected on the basis of our submission and asked to present our case to the award judges.

To be selected as the winner out of the other impressive nominees is testament to our staff's commitment to this system.

I believe we were successful as we were able to demonstrate:

- Significant improvements, not just to its WHS performance but also with general management practices.
- A significant change to our safety culture, whereby safety is genuinely part of the way we do our work, rather than an addition to it.
- That we have a solid system with engaged employees that provides our management team with the

information and assurance needed.

Q3: What does winning this award mean to you and your employees?

A: Achieving success with this award provides recognition of Insight Electrical Technology's management and also to our staff for their dedication to safety. Our dedication and commitment to providing a safe and healthy work environment has been commended by our clients and has contributed to our continuous growth and reputation within the electrical contracting industry.

Q4. What health and safety training does your company regularly provide employees?

A: Our company has a strong focus on training. All staff receive a formal induction upon commencement of employment and also training in our policies and procedures (e.g. environmental and quality policies and WHS Manual). They also attend monthly toolbox meetings.

We maintain a training matrix that records the training, skills and expertise of each employee, which can be used to identify shortcomings in all areas of required skills.

Q5: What are some of the most alarming work practices you have witnessed, or heard about, being undertaken by fellow electricians who are trying to "cut corners" and save on materials, time or money?

A: Electricians working alone on live apparatus, incorrect access equipment being used and also equipment not being calibrated regularly.

Q6: What do you believe to be instrumental in providing a safe and healthy environment for your employees?

A: Commitment from employees on all levels to accept changes. Remaining vigilant in the maintenance of the system and making a commitment to continual improvements.

Q7: From your time in the electrical industry, what key health and safety learnings would you like to share with recently licensed electrical contractors?

A: Consider the impact your risks can have on the lives of business owners, employees and their families; being physical, emotional and financial hardships. If you weigh this up, the investment in providing a safe workplace is a 'no brainer'.

Q8: The state government has recently announced penalty increases for breaches of workplace safety which are expected to come into effect around 2019. What are your thoughts on this?

A: Increased penalties are a great way of forcing those who

are continually flouting their own welfare and potentially others to toe the line, therefore, I do support harder penalties for those not trying to do the right thing.

Q9: What changes to industry practices would you like to see implemented to contribute to safer working environments and working conditions for electricians?

A: The training for an electrical contractors licence primarily focuses on areas such as business plans while there is only a small OHS component. I think the implementation of a documented Safety Management System and instruction on how to manage it should be a requirement if you hold an electrical contractor's licence.

We work in an extremely dangerous industry, which can be hazardous if not respected. There needs to be an emphasis on this from day one of electrical contractor training.

What's wrong with these installations?

Inspector's Orders have been issued for the defects shown in the photographs below. From these examples, see if you can correctly identify the defect and also find the relevant clause from AS/NZS 3000: 2007, Wiring Rules. The answers are provided on page 21 (test yourself).

Image A:



Image B:



Image E:

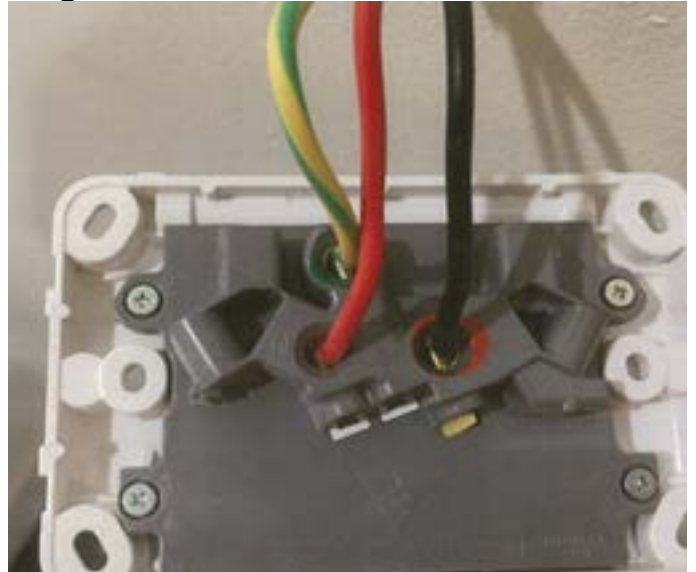


Image C:



Image F:



Image D:



Switchboard fire protection sealing

Electrical contractors must comply with Clause 2.9.7 of AS/NZS 3000:2007, which states:

2.9.7 Fire-protection measures

Wiring associated with switchboards shall be installed in such a manner that, in the event of fire originating at the switchboard, the spread of fire will be kept to a minimum.

Far too many contractors are failing to do so, as evidenced by the chart on the next page, showing the unacceptably high proportion of Clause 2.9.7 breaches. These breaches continue to be found during installation inspections despite repeated efforts by network operators to encourage compliance.

The following photographs are examples illustrating typical compliance failures found often during inspections.

While there are no specific standards for switchboard

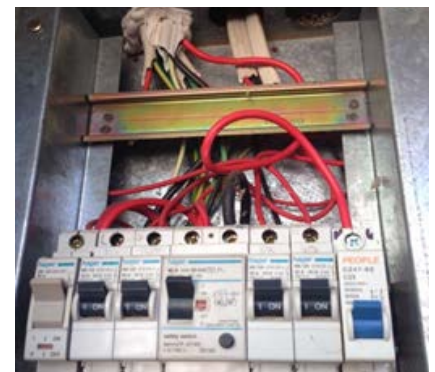
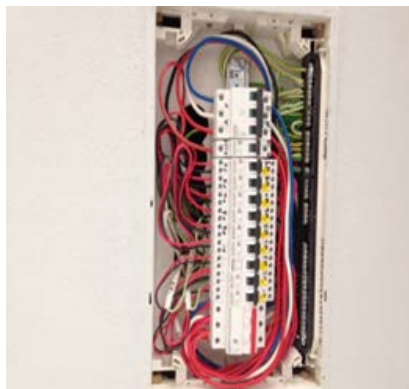
fire sealing, acceptable methods are readily available to achieve the objectives of Clause 2.9.7, including:

- fire-rated expanding foam;
- fibre-glass sheets;
- fire-rated putty; and
- fire-rated panels to seal wall cavities above switchboards.

Simply replacing older switchboard panels with a DIN kit, leaving the back of a switchboard open to the wall cavity is unacceptable. The board must be properly sealed.

The most effective approach to fire sealing will depend on the type and location of the switchboards and the number and sizes of cable entries involved. Contractors and their employed electricians are expected to assess these and select the most appropriate sealing method for the situation at hand.

Failure to comply with Clause 2.9.7 is a serious defect, regarded as such by network operators and EnergySafety. If contractors continue to breach the requirements of this Clause, EnergySafety will take appropriate enforcement action.



Examples of typical compliance failures often found during inspections

Serious defects – 1 July to 30 September 2017

The number of serious defects taken from Inspector's Orders issued by EnergySafety and network operator inspectors between 1 July and 30 September 2017 are shown in the following chart and table.

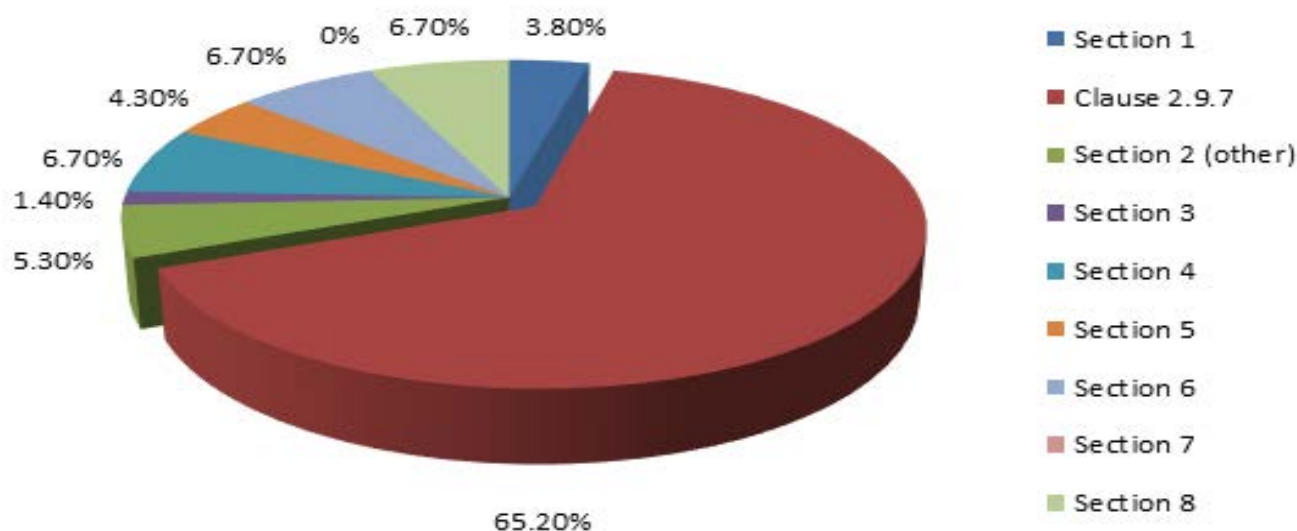
A summary of the defects this period is as follows:

Number of non-serious defects = 912

Number of serious defects = 210

TOTAL = 1,122

Proportion of serious defects identified 1 July to 30 September 2017



Pie chart showing the proportion of serious defects from Sections 1 to 8 of AS/NZS 3000: 2007, Wiring Rules

| Section | Clause | Serious defects identified |
|---|-----------|---|
| Section 1 - Scope, Application and Fundamental Principles Scope, application, referenced documents, definitions, fundamental principles, design of an electrical installation, selection and installation of electrical equipment, verification (inspection and testing) and means of compliance | 1.5.3 | Protection not provided against electric shocks |
| | 1.5.4 | Where contact can be made with live terminal/conductors without the use of a tool i.e. exposed live parts/conductors (including fittings left off) and wiring joints (including taped joints) |
| | 1.5.4.1 | No protection provided against dangers that may arise from contact with parts of the electrical installation that are live in normal service. |
| | 1.5.11.4 | Protection not provided from voltage in unused conductors |
| | 1.7.1 | Selection and installation of equipment is unsafe or not installed to manufacturer's recommendation |
| Section 2 - General arrangement, control and protection General, arrangement of electrical installation, control of electrical installation, fault protection, protection against overcurrent, additional protection by residual current devices, protection against overvoltage, protection against undervoltage and switchboards | 2.3.3.1 | Supply to electrical installation not controlled by main switch on the main switchboard or switches that control the whole installation |
| | 2.5.1 | Circuit protection/switches not correct for cable size/MD/equipment (overload/short circuit/RCD) or not fitted |
| | 2.5.1.2 | Submains and final subcircuits not protected by an overload device |
| | 2.5.3 | Protection from overcurrent not provided |
| | 2.6.1 | Additional protection shall be provided, where required by Clause 2.6.3, to automatically disconnect the supply when an earth leakage current reaches a predetermined value |
| | 2.6.3 | Additional RCD protection not provided for final subcircuits |
| | 2.6.3.1 | Additional protection by RCDs with a maximum rated residual current of 30 mA has not been provided for final subcircuits of lighting points, socket outlets or directly connected hand held appliances. |
| | 2.6.3.2.1 | Circuit protection/switches not correct for cable size/MD/equipment (overload/short circuit/RCD) or not fitted |
| | 2.9.2.1 | Switchboard not installed in a suitable location, protected against moisture or arranged to provide sufficient space for the later replacement of items |
| | 2.9.7 | Switchboard spread of fire protective measures do not meet requirements |
| Section 3 - Selection and installation of wiring systems General, types of wiring systems, external influences, current-carrying capacity, conductor size, voltage drop, electrical connections, identification, installation requirements, enclosure of cables, underground wiring systems, aerial wiring systems and cables supported by a catenary | 3.4.4 | Current carrying capacity of conductors is not coordinated against the protective device |
| | 3.9.3 | Support and fixing of wiring system does not meet requirements |
| | 3.10.2.1 | Incorrect type of wiring enclosure used to protect cables |
| Section 4 - Selection and installation of appliances and accessories General, protection against thermal effects, connection of electrical equipment, socket-outlets, lighting equipment and accessories, smoke and fire detectors, cooking appliances, appliances producing hot water or steam, room heaters, electric heating cables for floors and ceiling and trace heating applications electric duct heaters, electricity converters, motors, transformers, capacitors, electrical equipment containing liquid dielectrics and batteries. | 4.1.2 | Selection and installation of appliances does not meet requirements |
| | 4.1.3 | Electrical equipment not suitable for exposure to external influences |
| | 4.12.5 | Electricity converters not provided with overcurrent protection |
| | 4.18.2 | Electrical equipment that is a source of ignition shall not be installed within hazardous areas |
| | 4.19 | Equipment that does not operate correctly (switches, RCDs, ACBs etc. that are provided for protection/safety) |
| | 4.7.1 | Cooking appliance not fitted with switching device operating in all active conductors and mounted in an accessible position |
| | 4.8.2.3 | Equipment that does not operate correctly (switches, RCDs, ACBs etc. that are provided for protection/safety) |

| Section | Clause | Serious defects identified |
|--|-----------|---|
| Section 5 - Earthing arrangements and earthing conductors General, earthing functions, earthing system parts, earthing of equipment, earthing arrangements, equipotential bonding, earth fault-loop impedance, and other earthing arrangements. | 5.1.3 | Equipment not earthed correctly or earthing not installed correctly (including MEN connections) |
| | 5.3.5.1 | Failure to install an MEN connection |
| | 5.3.5.2 | MEN size does not meet requirements |
| | 5.3.6.4 | Location of earth electrodes does not meet requirements |
| | 5.4.1.1 | Exposed conductive part/s of electrical equipment not effectively earthed as required |
| | 5.5.1.2 | Equipment not earthed correctly or earthing not installed correctly (including MEN connections) |
| | 5.5 | Earthing arrangements do not meet requirements |
| | 5.6.1 | Equipment not earthed correctly or earthing not installed correctly (including MEN connections) |
| | 5.6.2.1 | No or inadequate labelling on solar PV system installation |
| Section 6 - Damp situations General, baths, showers and other fixed water containers, swimming pools, paddling pools and spa pools or tubs, fountains and water features, saunas, refrigeration rooms, sanitization and general hosing-down operations | 6.2.2.2 | The classification of zones in a damp situation for other fixed water containers do not meet requirements |
| | 6.2.4.2 | Socket outlets installed in a damp situation does not meet requirements |
| | 6.2.4.3 | Switches and other accessories in damp situations do not meet requirements |
| | 6.4.3.2.1 | Electrical equipment associated with fountain or water feature not supplied or protected as required |
| Section 7 - Special electrical installations General, safety services, electricity generation systems, electrical separation (isolated supply), extra-low voltage electrical installations, high voltage electrical installations, hazardous areas (explosive gas or combustible ducts) and specific electrical installation standards | Nil | Nil |
| Section 8 – Verification General, visual inspection, testing and date of initial energisation of an installation. | 8.1.2 | The installation was not safe and verified to meet the standard before being placed into service |
| | 8.2 | Visual inspection of completed work not carried out |
| | 8.3.1 | Installation not tested in accordance with Clause 8.3.3 before being placed into service |
| | 8.3.10.1 | No testing carried out on final subcircuits protected by RCDs to verify disconnection of designated circuit |
| | 8.3.3 | Mandatory testing on low-voltage electrical installation not carried out after completion of, or in association with visual inspection |
| | 8.3.6.1 | Insulation resistance between conductors and earth of equipment is less than required |
| | 8.3.6.2 | Insulation resistance results from testing carried out between conductors of consumers mains and submains and live and earthed parts does not meet requirements |
| | 8.3.7.2 | Active, neutral or protective earthing conductors in the electrical installation are incorrectly connected to corresponding terminals in the equipment |

Reporting defects

If you come across an unsafe installation or equipment, under Regulation 62(1) of the Electricity (Licensing) Regulations 1991 you are required to undertake the following:

- Report the defective work to the owner/occupier.
- Let them know the defective work is required to be reported to the network operator.
- Report the defective work to your relevant network operator (where the network operator cannot be identified, the relevant network operator is EnergySafety).
- If you are carrying out work on behalf of your employer (electrical contractor or In-house licence holder), your employer must also be made aware of the defective work.

Network operator contact details can be found on [EnergySafety's website](#).

Prosecutions for breaches of electricity legislation

Between 1 July and 30 September 2017

| Name (and suburb of residence at time of offence) | Licence number | Legislation and breach | Offence | Date of offence | Fine (\$) | Court costs (\$) |
|--|-------------------|--|---|---------------------|-----------|---------------------|
| Electricity Networks Corporation T/As Western Power (Perth) | | Regulation 10(1)(c) E(SS&SS)R, 2001 | A Network Operator failing to ensure that a prescribed activity was carried out to avoid or minimise damage to property, inconvenience or other detriment | 2 February 2015 | 55,000.00 | 724.50 |
| Electricity Networks Corporation T/As Western Power (Perth) | | Regulation 242(1)(b) ER 1947 | A network operator supplied electricity to a premises and the connection of the supply of electricity to the premises caused, or is likely to cause, the consumers' electric installations to become unsafe | 23 February 2015 | 60,000.00 | 742.50 |

NLH: No Licence Held

Answers to 'what's wrong with these installations?' from page 16

- A. Clause 5.5.1.1 - main earthing conductor left unterminated
- B. Clause 3.1.2 - a "live" unterminated cable for a socket outlet
- C. Clause 3.3.1 – unsupported cables entering an inverter
- D. Clause 5.3.5 - no MEN connection installed at the main switchboard
- E. Clause 4.4.5 - transposed active and neutral conductors of a socket outlet
- F. Clause 3.7.3 - unenclosed joints in the roof space

Composite piping installation

Recent pre-inspections, carried out on domestic dwellings at tube out stage, have revealed some common non-compliances in regard to the composite piping installations.

The recurring issues are:

- open ends at appliance copper reversion and in the meter box;
- insufficient pipe support;
- composite consumer piping exposed to Ultra-Violet (UV) light (sunlight);
- no reversion fittings/sections; and
- incorrect location of reversion fittings/sections.

Open ends

When the gas fitter completes the tube-out stage the piping ends are required to be effectively sealed. While effective **temporary** forms of sealing such as crimp and weld are acceptable, duct tape or the like is **not** acceptable. The required effective sealing allows for the mandatory 7kPa piping test to be completed and stops any foreign matter from entering the piping. It is also highly recommended that the temporary projecting pipe ends have some form of appropriate soft material attached so as to protect workers and site visitors from injury. If any injuries do occur, the installing gas fitter may be liable.



Non-compliant



Temporarily compliant



Temporarily compliant



Non-compliant

Support of consumer piping

Composite piping is required to be supported in accordance with Section 5.8 of AS/NZS 5601.1:2013.

The consumer piping support system shall:

- (a) be capable of supporting the piping system;
- (b) firmly restrain the piping in the intended position and control movement of the piping system, taking into account any seismic requirements where appropriate; and
- (c) have any component of the supporting system, which is to be in contact with the pipe, made of material that is compatible with the consumer piping material or electrically isolated from such piping system or equipment.

NOTES: To satisfy these requirements consideration needs to be given to:

- (a) the construction and dimensions of the supporting device and its components;
- (b) the method and strength of attachment to the supporting structure as well as the stability of the supporting structure;
- (c) the possibility of damage to exposed consumer piping spanning joists or bearers; and
- (d) movement due to thermal expansion and contraction.

Spacing of supporting devices

The spacing of supporting devices shall not exceed those given in Table 5.5 of AS/NZS 5601 (as below), or shall be in accordance with the piping manufacturer's relevant recommendations.

Table 5.5 Spacing of supporting devices

| Nominal size of pipe DN | Vertical or horizontal run spacing, metres | | | |
|-------------------------|--|--------------------------------|---------------------------|-----------------|
| | Steel pipe | Copper or stainless steel pipe | Semi-rigid stainless pipe | Multilayer pipe |
| 8 | 2 | 1 | - | - |
| 10 | 2 | 1.5 | - | - |
| 12 | - | - | 0.5 | 0.75 |
| 15 | 2 | 1.5 | 0.5 | 1 |
| 18 | - | 1.5 | - | - |
| 20 | 2.5 | 1.5 | 0.5 | 1.25 |
| 25 | 2.5 | 2 | 0.5 | 1.5 |
| 32 | 3 | 2.5 | - | 2 |
| 40 | 3 | 2.5 | - | 2 |
| 50-65 | 3 | 3 | - | 2 |
| 80-200 | 4 | 4 | - | - |

Some gas fitters are suspending composite piping from roof hanger to roof hanger sometimes in excess of three metres between support. Such practice is not tradesman like, non-compliant and will result in a Notice of Defect.

Protection from Ultra-Violet light (UV)

Composite piping is required to be protected from exposure to UV light. The most common situation where composite piping has been found unprotected is under the gas meter as shown below.



Compliant



Non-compliant

The bottom image clearly shows the composite piping exposed to UV light and therefore non-compliant.

Reversion fittings

Where the composite piping main run is in excess of ten metres and is connected to more than one appliance, reversion pieces are required. These reversion pieces are required to be in the main piping run immediately prior to the first and last branch take off point. Where this first branch take off point is also the last branch take off point only one reversion piece is required.

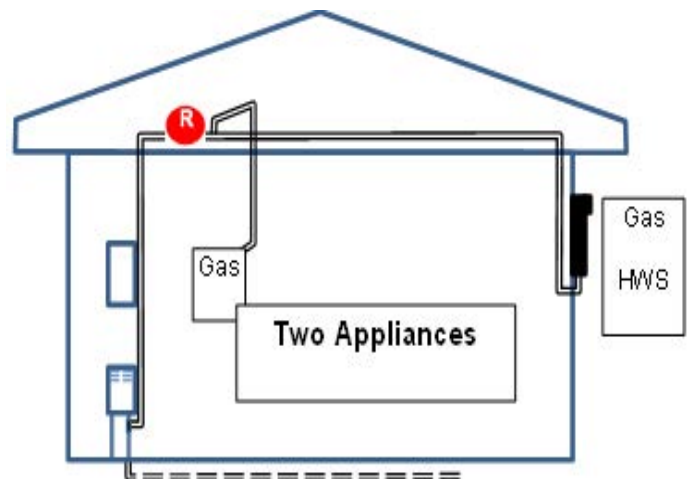
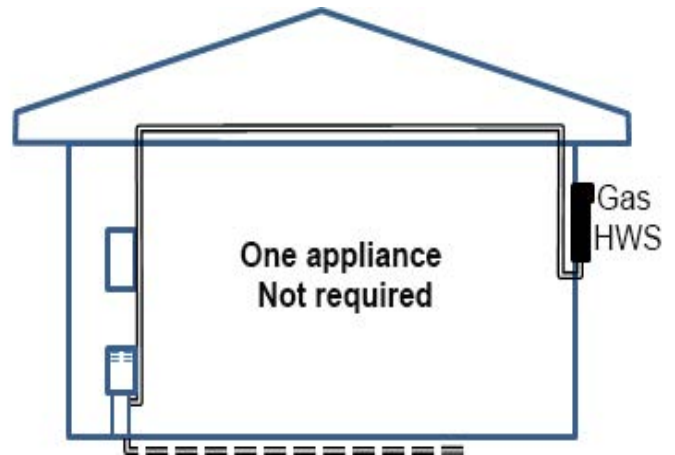
Some gas fitters are not installing any reversion pieces and some are placing the reversion pieces in the branch runs and at the end of the main run past all of the branch take off points. This will result in a Notice of Defect being issued to the installing gas fitter.

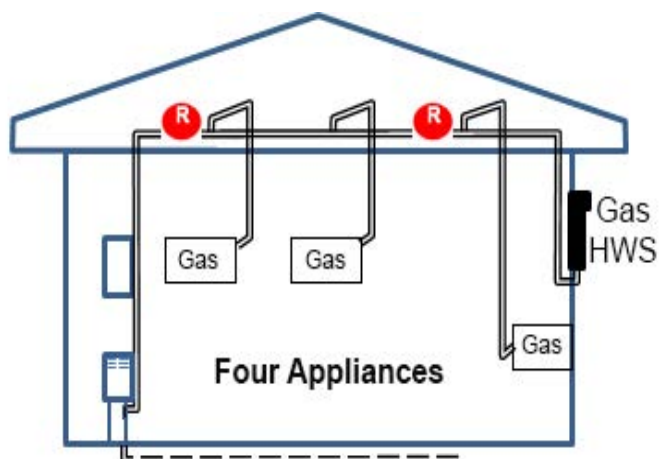
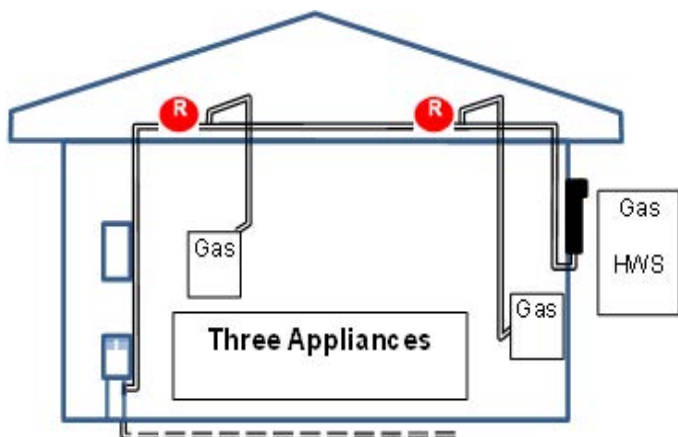
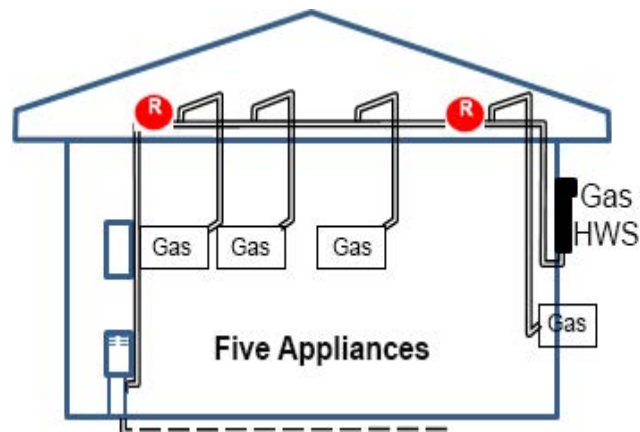
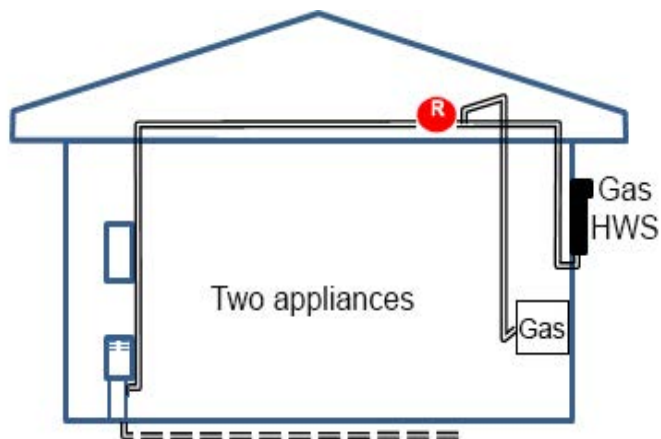
The images below have been produced to help gas fitters understand the reversion fitting requirements and the acceptable locations.

AS/NZS 5601.1.2013 clause 5.2.13

Proprietary Piping: Reversion Fitting Requirements

R = Reversion Fitting





Flue installation for Type B appliances

The installation of a flue for a Type B gas appliance is a major part of the appliance installation. The design of the flue ensures the correct operation of the appliance and removal of combustion products.

Two important features with the design and installation of the flue are continually being missed.

During compliance inspections of Type B appliances, EnergySafety is finding the support of the flue and the requirement to be able to remove the appliance does not meet the requirements of the Regulations.

Flues are to be supported independently of the appliance unless the appliance has been designed to support the flue. Where the appliance is designed to support the flue the manufacturer must provide details of how it is supported. It should be noted the flue must also be designed so that the appliance can be removed without disturbing the roof seal.

AS/NZS 5601.1:2013 Section 6.8, Flue Installation outlines the minimum requirements for appliances fitted with a flue.

6.8.1 Provision for removal of gas appliance

Where removal of a gas appliance is likely to require the movement or displacement of the flue, the flue shall be installed so that such movement or displacement does not disturb the roof seal or flashing.

Note: Provision of a slip socket or bolted sleeve at the gas appliance flue connection is an acceptable method of connecting the flue to a gas appliance and satisfying this requirement.

6.8.2 Support independent of gas appliance

Flues shall be supported independently of the appliance unless the appliance is designed to support the flue. Flues shall be securely fixed and adequately supported by bracket(s) fastened to the building structure at suitable points, to ensure the stability of the flue unless the flue is designed to be structurally independent of the building.



Independent supports and bolted sleeve so that appliance can be removed without disturbing the roof seal

Servicing Type B appliances

Regulation 36(4A) of the Gas Standards (Gasfitting and Consumers Gas Installations) Regulations 1999 (GSR1999) states:

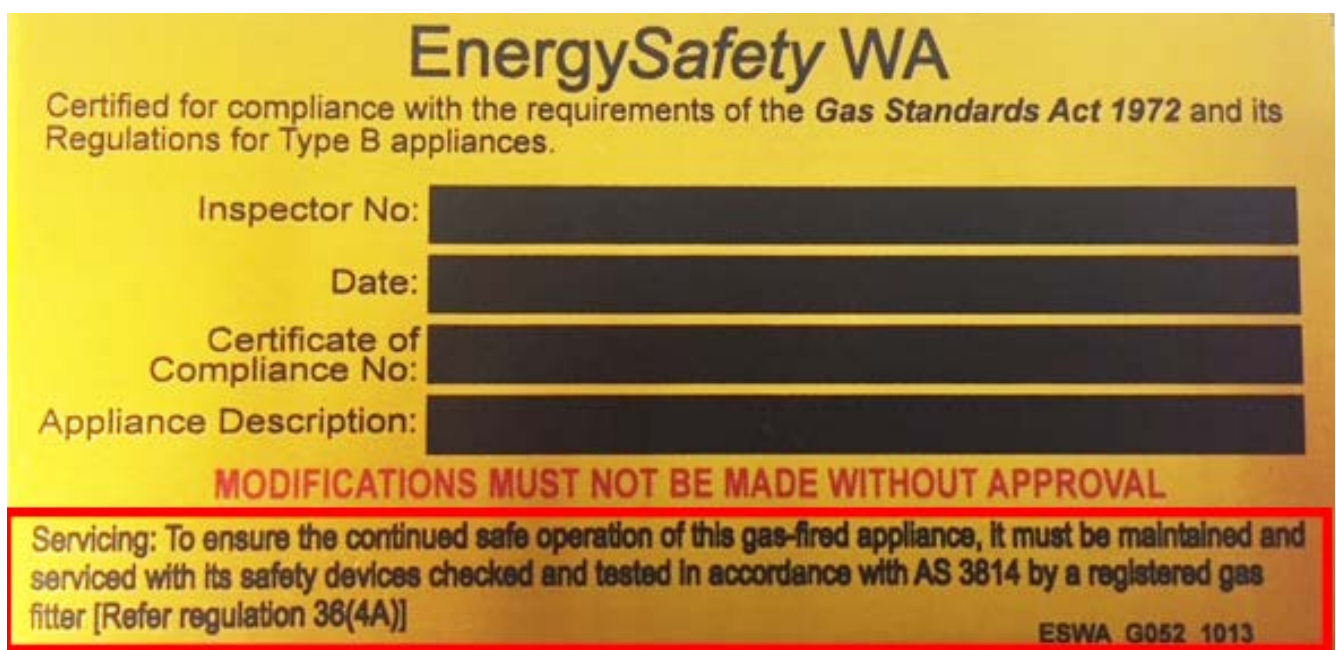
If a consumers gas installation includes a Type B appliance, the consumer must ensure that the appliance is maintained and serviced by a registered gas fitter in accordance with AS 3814 Industrial and Commercial gas-fired appliances

This regulation renders the relevant parts of AS 3814 mandatory, that is, the relevant advisory or informative provisions must be observed as specifying how and when the maintenance and servicing is to occur.

In summary, a consumer must ensure that a Type B gas appliance is maintained and serviced by a registered gas fitter in accordance with the requirements of the manufacturer's recommendations and AS 3814, this includes the gas system safety interlocks, refer to Appendix G.

Class I gasfitters should consider advising their clients of this regulatory requirement which is readily available on the approval badge and the Certificate of Compliance.

On completion of the servicing work the gas fitter must attach a service label to the appliance as required by Regulation 23 of GSR 1999.



Type B gas appliance badge highlighting the servicing requirement



Government of **Western Australia**
 Department of **Commerce**
 EnergySafety

EnergySafety
 Approved Form
 Issued February 2017

CERTIFICATE OF COMPLIANCE FOR AN INDIVIDUAL TYPE B GAS APPLIANCE

Certificate No.

1. DESCRIPTION OF TYPE B GAS APPLIANCE

| | | | |
|---------------------------------|--|--------------|--|
| Description of Appliance: | | | |
| Nominal gas consumption (MJ/h): | | | |
| Gas Supplier: | | Type of Gas: | <input type="checkbox"/> NG <input type="checkbox"/> LPG |

2. APPLIANCE IDENTIFICATION

| | |
|--------|--|
| Make: | |
| Model: | |
| S/N: | |

3. INSTALLING DETAILS

| | | | | | | | | |
|---------------------------|--|----|--|--|--|--|--|--|
| Gas Fitter's Name: | | GF | | | | | | |
| Notice of Completion No.: | | | | | | | | |

4. COMMISSIONING DETAILS

| | | | | | | | | |
|---------------------------|--|----|--|--|--|--|--|--|
| Gas Fitter's Name: | | GF | | | | | | |
| Notice of Completion No.: | | | | | | | | |

5. APPLIANCE LOCATION DETAILS

| | | | |
|-----------------------|--|-------------------|--|
| Business Name: | | | |
| Contact Name: | | Telephone Number: | |
| Email Address: | | | |
| Installation Address: | | | |

The gas appliance described above has been inspected and is hereby certified as complying with Regulation 32 of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999. A Compliance Badge (or label) has been fitted to the appliance.

| | | | |
|---------------------------------|--|---------------------|----|
| Gas Inspector's Name (printed): | | Gas Inspector's No: | GI |
| Signature: | | Date: | |

To ensure the continued safe operation of this gas-fired appliance, it must be maintained and serviced with its safety devices checked and tested in accordance with AS 3814 by a registered gas fitter [Refer regulation 36(4A)].

Note: If the appliance is approved in a workshop, three copies of the form are to be forwarded to the appliance manufacturer, for the manufacturer to distribute to the gas supplier (blue copy), consumer (yellow copy) and gas fitter (green copy).

EnergySafety – **White** Gas Supplier – **Blue** Consumer – **Yellow** Commissioning Gas Fitter – **Green** Inspector – **Pink**

ESWA.G057.0217

Certificate of Compliance for an Individual Type B Gas Appliance highlighting the requirement for servicing

Summary of infringements for breaches of gas legislation

Between 1 July and 30 September 2017

| Legislation and breach | Offence | Number of Infringements | Fine (\$) |
|------------------------|--|-------------------------|-----------------|
| r. 18(2) | Failing to ensure gas installation complies with prescribed requirements | 5 | 3,000.00 |
| r. 28(2) | Failing to attach approved badge or label to gas installation upon completion of gasfitting work | 1 | 400.00 |
| r. 28(3) | Failing to give notice of completion of gasfitting work within required time | 3 | 1,200.00 |
| r. 30 | Failing to rectify defects and give notice of rectification within required time | 2 | 1,200.00 |
| | Total | 11 | 5,800.00 |