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energy Bulletin

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National Occupational Licensing System draft Regulations and Regulatory Impact Statement

The introduction of the National Occupation Licensing System (NOLS) is tracking for implementation on 1 July 2012. The NOLS has been agreed in principle by all Australian Governments. It will introduce national occupational licences. These will include most electrical and gas licences.

Draft Regulations and Regulatory Impact Statements (RIS) for each occupational licence will be released for public comment in July.

I can not stress enough how important it is for licence holders and interested parties to obtain and review the draft Regulations and RIS for their occupations. These are the 'nuts and bolts' of the occupation licences and may affect your future.

There will only be a six week period for comment once the draft Regulations and RIS have been released. The draft Regulations and RIS will be available from the NOLS web site:

http://nola.gov.au/

or from Energy*Safety* on request.

The past two years

Over the last two years, stakeholders, including regulators, licensing authorities and industry bodies, have been contributing recommendations for best licensing practice for their occupations. These have been considered by the steering committee drafting the Regulations, but not necessarily accepted.

Energy*Safety* has been a vocal participant in this process advising on the structure, scope of work, and qualifications required to gain electrical and gasfitting licences.

Road shows

To provide information on the draft Regulations and RIS, and the chance to provide public comment, the National Licensing Taskforce and Steering Committee have proposed presentations throughout Australia in July and August 2011. Those who will be affected by the national licensing system should take advantage of this opportunity to make their concerns known.

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Gas Appliance Rectification Programme

The Gas Appliance Rectification Programme has now entered the second stage which involves the modification and replacement of the registered pre-1980 natural gas appliances.

A contract has commenced to undertake the modification and replacement stage. Energy*Safety* in partnership with the contractor will systematically work through the information gained from the inspections and notify all registered consumers about the work that will be carried out to make their gas appliance safe.

Registered consumers will either be informed that their old appliance:

- poses no safety risk and no work is required;
- needs to be serviced at no cost; or
- qualifies for replacement with a brand new appliance, free of charge.

The modification and replacement stage will run between May 2011 and the end of 2012. All work will be completed before the changed gas comes on stream in 2013.

The modification and replacement stage will be conducted in zones (suburbs or groups of suburbs). 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 advise they will be contacted to arrange a suitable time to carry out the required work.

The Programme will be in the following areas over the coming months:

Zone 1:

6008 – Subiaco/Shenton Park/ Daglish

6009 – Nedlands/Dalkeith/Crawley

6010 – Claremont/Karrakatta/ Mount Claremont/Swanbourne

6011 – Cottesloe/Peppermint Grove

6012 – Mosman Park

Zone 2:

6050 – Mount Lawley/Coolbinia/ Menora

6051 – Maylands

6052 – Inglewood/Bedford

6060 – Yokine/Joondanna/ Dog Swamp/Tuart Hill

The Appliance Rectification Programme will rotate through these areas 3 – 4 times in the next 12 – 18 months.

Regular updates and the target zones are available on the Energy*Safety* website www.energysafety.wa.gov.au.

Changes to Electricity Regulations

Since publication of Energy Bulletin 54 (April 2011), three items of legislation have been published in the *Government Gazette* and are now law.

On 10 May 2011, the Electricity (Licensing) Amendment Regulations 2011 were published. The effect is to include the assessment of electrical installations for compliance with the Licensing Regulations in the definition of electrical work. This means, if an assessment is requested by a homeowner or potential purchaser, only a licensed electrical contractor can undertake this work and provide their clients with a written report concerning the condition of electrical installations. The intent of the amendment is to provide confidence to home owners and potential purchasers of residential property that a report concerning the condition of the electrical installation has been carried out by a reputable licensed person. Specific details of Energy*Safety*'s recommended inspections and tests will be set out in a future amendment to the WA Electrical Requirements.

Also on 10 May 2011, the Electricity Amendment Regulations (No. 3) 2010 were published. The effect is to simplify some processes dealing with the requirement to install RCDs in residential premises prior to sale, particularly with regard to those to be demolished within six months of sale. In the case of a mortgagee sale, if the required RCDs have not been installed prior to sale they must be installed within two months of the sale by the new owner, who may seek reimbursement from the previous owner.

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

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Regulation 242 has been amended to insert requirements for a network operator to ensure when connecting (which includes re-connecting) a premises to its distribution network that it does not cause the electrical installation to become unsafe e.g. by transposing the active and neutral conductors.

On 17 May 2011, the Electricity (Licensing) Amendment Regulations (No.2) 2011 were published. The effect is to change the name of the Certificate of Compliance to Electrical Safety Certificate; provide standing exemptions from the requirement to submit a preliminary notice or notice of completion to a network operator under specified conditions; and provide standing exemptions from the requirement to give an Electrical Safety Certificate to a client on completion of any electrical work.

More detail on the amendment Regulations is provided in the Electrical Focus section in this Bulletin and we encourage you to familiarise yourself with these new requirements.

Gas Industry Reference Group

Energy*Safety* is inviting currently registered and active gas fitters to partake in the Gas Industry Reference Group (GIRG).

The invitation is also being extended to those organisations that have a direct involvement with the gas industry such as training providers, equipment suppliers, gas suppliers, network operators and the like.

The purpose of the GIRG is to provide Energy*Safety*'s Gas Directorate feedback on industry opinions regarding discussion papers it publishes from time to time. GIRG members may also bring to the attention of Energy*Safety* industry matters for discussion.

We are looking for nominations from those involved in:

- domestic, commercial gasfitting, Class G;
- industrial gasfitting, Class I;
- automotive and mobile engines, Class E; and
- autogas refuelling facilities, Class P.

Information will be sent to the GIRG by e-mail therefore those nominating to become a member of the GIRG will need a current e-mail address.

Energy*Safety* has in the past constituted a number of industry working groups to get industry opinion on various matters such as training, licensing and gasfitting authorisation. GIRG members may be invited to partake in industry working groups in the future.

Unless the matter for discussion is of a general nature then the particular subject will be directed to that reference group e.g. only auto gas fitters will be consulted on matters concerning Class E gasfitting and similarly the same for each class of gasfitting.

Depending on the response a cross section of those applying will be chosen at random to become a GIRG member.

Those members of the current GIRG who wish to continue in the reference group should also renominate to continue their involvement.

If you are interested in becoming a member of the GIRG then please contact Angela (08) 9422 5206 or Cathy 9422 5214 for an application form.

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electrical focus

Electrician prosecuted for leaving 'live' unterminated cable

During the complete wiring of a house, an electrician failed to connect a socket outlet in the garage, which left a 'live' unterminated cable with insulating tape partially covering the cable end, protruding from the garage wall. This unsafe and substandard work is contrary to Clause 1.5.3 of the AS/NZS 3000:2007, Wiring Rules.

Contrary to Regulation 49(1) of the Electricity (Licensing) Regulations 1991 and Clauses 1.8, 8.2 and 8.3 of the ASNZS 3000:2007, Wiring Rules, the electrician failed to check and test the installation. Had he done so, he would have discovered the serious defect.

Contrary to Regulation 52(3) of the Electricity (Licensing) Regulations 1991, the electrical contractor (who is also a sole trader) had also submitted a Notice of Completion to the network operator Western Power in which he certified that the electrical work he had carried out at the property had been checked and tested and was safe to connect to the electricity supply.

The electrical contractor and electrician were represented by NECA and pleaded guilty to the breach of Regulation 49(1) of the Electricity (Licensing) Regulations 1991 and not guilty to the breach of Regulation 52(3).

The magistrate found the electrician and electrical contractor guilty on both charges. Regulations 49(1) and 52(3) reflect two separate responsibilities; one for the electrician carrying out the work, and the second for the electrical contractor issuing a guarantee that the work was safe, complied with the Regulations and was complete.

The Magistrate issued a global fine of $2,000 with costs of $1,925.30.

In the past decade, Energy*Safety* has completed sixty two successful prosecutions for breaches of Regulation 52.

Electrical Contractor prosecuted for failing to report electric shocks

An electrical contractor was prosecuted recently for failing to report electric shocks received by a tenant at a property in Beresford, to the network operator (Western Power). Regulation 63(2) of the Electricity (Licensing) Regulations 1991 states that immediately after a person becomes aware that an electrical accident has taken place, the person is to report it to the network operator.

An electrician from the electrical contracting business attended the property to investigate the cause of the shocks and carried out a series of tests in accordance with the company's documented testing procedures. The electrician could not determine the cause of the shocks.

In hindsight, before attending the site, the electrical contractor should have notified the network operator immediately who would have investigated this incident.

Following a further complaint by the tenant to the real estate company, a Western Power service crew was called out to investigate the electric shocks. The service crew disconnected the electricity supply at the mains connection box (MCB) as the terminals in the MCB were severely corroded and unserviceable. A Western Power Inspector issued an Inspectors' Order for the MCB to be replaced before the electricity supply could be restored.

Only after the Western Power inspection, did the electrical contractor notify the network operator.

The electrical contractor was found guilty and the Magistrate imposed a fine of $4,000 with costs of $649.70.

Audit reveals non-submission of notices

A recent audit in Karratha revealed an electrical contractor had carried out electrical installing work for which he did not submit notices to the network operator Horizon Power.

An Energy*Safety* Senior Electrical Inspector carried out an audit of the electrical contractor to check compliance with the relevant

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electricity legislation. Eighteen invoices were randomly selected to check for the submission of Preliminary Notices, Notices of Completion and Electrical Safety Certificates. The contractor was unable to provide copies of six notices for the invoices to the Inspector and also stated that he had not provided copies of Electrical Safety Certificates to his customers.

On 16 May 2011 in Broome Magistrates Court, the contractor entered an endorsed plea of guilty and was issued a global fine of $4,000 with costs of $649.70 for not submitting Preliminary Notices and Notices of Completion in two instances.

The electrical contactor was only charged with two breaches of Regulation 51 and two breaches of Regulation 52(1) of the Electricity (Licensing) Regulation 1991 even though there were twelve offences.

Changes to the Electricity (Licensing) Regulations 1991 – FAQ's

The following FAQ's provide electrical contractors and electricians an understanding of the changes to the Regulations.

Q1: An electrical contractor has been engaged to carry out work but cannot complete the work, does he have to submit a Notice of Completion?

A1: Yes, when it is realised that you can no longer carry out any further work on an installation, even though the work is not complete and not ready to connect to the electricity supply, you must submit a Notice of Completion for the electrical work you have carried out. The notice must indicate the work status and that the installation is not ready to connect to the electricity supply.

Q2: Do I have to submit notices when another electrical contractor is also engaged on the project?

A2: Yes. When notifiable work is carried out, or is caused to be carried out by more than one electrical contractor, each contractor must submit notices for their portion of the work carried out, or caused to be carried out.

The notice must clearly describe the portion of the work carried out by each Contractor.

Q3: As an Electrical Contractor, should I submit notices for electrical work that I have not carried out?

A3: No. It is an offence to sign and submit a notice for work not carried out or caused by the contractor signing.

Q4: Do I need to make a request to Energy*Safety* for an exemption from the submission of notices at mine sites?

A4: Electrical contractors carrying out notifiable work at mine sites no longer need to request an exemption from the submission of notices for certain types of work. Notices do not need to be submitted to the relevant network operator, so long as the work does not:

- involve an initial connection to distribution works or a private generating plant;
- require an alteration to a main switchboard;
- require an alteration to service apparatus or distribution works;
- consist of the installation or removal of a private generating plant; or
- alter the capacity of a private generating plant.

Q5: If I am not submitting notices at the mine site, should I be keeping a record of the electrical work carried out?

A5: Yes. The electrical contractor carrying out the work must ensure a record is kept of all notifiable work, alongside a declaration that the work has been checked and tested, is safe and complies with the Regulations. Energy*Safety* provides a log book to mine site managers for this purpose.

The records of the notifiable work are to be kept at the mine site until it is no longer operating.

The principal employer commits an offence if they fail to ensure that accurate records of the notifiable electrical work are kept.

Q6: For what electrical work do I need to issue an Electrical Safety Certificate to my customers?

A6: An electrical contractor carrying out any electrical installing work, or causes any electrical installing work, commits an offence if they do not deliver an Electrical Safety Certificate to the person for whom the work was carried out within twenty eight days after the work was completed.

However, an Electrical Safety Certificate is not required for:

- maintenance work;
- in-house electrical installing work carried out under an in-house electrical licence;
- electrical installing work carried out at a mine, so long as the electrical contractor makes a record of the work in a form approved by the Director (on-site Energy*Safety* log book); and
- electrical installing work associated with the installation of a temporary builder's supply.

Q7: What are some examples of maintenance work?

A7: Maintenance work comprises repairing faulty electrical equipment or replacing it with equal, or substantially similar engineering specification (i.e. like for like).

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Examples include:

- replacing a bayonet cap lighting fitting with another bayonet lighting fitting;
- replacing a socket outlet for another socket that is of similar specification;
- replacing a light switch with another light switch;
- replacement of a hot water system of similar specification;
- replacing a single oven with another single oven; and
- disconnection and reconnection of motors and motor starters including the replacement of motors of similar specification.

Q8: What are some examples of work which is not deemed to be maintenance work?

A8: Examples include:

- replacing a single or double socket outlet with a quad socket outlet;
- replacing a single oven with a double oven;
- replacing a main switchboard panel with a new metallic din kit and circuit breakers; and
- replacing a single-phase consumers main with underground three phase consumers mains.

Q9: Do I need to submit Preliminary Notices to the network operator for all notifiable work?

A9: No. A Preliminary Notice is not required if the work carried out, or caused to be carried out, is on a main switchboard or on consumers mains and the work does not require:

- an alteration to service apparatus or distribution works;
- disconnection from, or connection to distribution works;
- isolation from distribution works by means of switching or, the removal of fuses or links to allow for the work to be carried out safely;
- the addition or removal of control or protective switch gear; or the disconnection of a final sub-circuit from, or the removal of, a private generating plant with a capacity not exceeding 25kW.

Q10: Is an exemption for RCDs required if an installation is to be demolished within six months after its sale?

A10: No. However, the vendor must receive written notice from the buyer, before the transfer of the title takes place, stating that the residence will be demolished within six months. The demolition must then occur within six months after the transfer of the title.

NB: If the title of a residential premise has been transferred for a residence that is to be demolished and the new owner has not demolished the residence within six months, the new owner must ensure that at least two RCDs are installed.

Q11: I've been asked to complete the electrical installation of a transportable house. Do notices and Electrical Safety Certificates need to be submitted to the network operator for work on this transportable?

A11: Yes. A Preliminary Notice is required and a Notice of Completion when the transportable is ready for connection to the electricity supply as this is considered a new installation.

The information provided in the Notice of Completion should specify:

- the address where the electrical work was undertaken;
- the maximum demand calculation;
- the work carried out, such as the interconnection of wiring, installation of main earth conductors and consumers mains; and
- the entire electrical installation has been checked and tested.

This information should be written in the comments section of the notice.

An Electrical Safety Certificate will need to be supplied to the person requesting the work to be undertaken.

Replacement of semi-enclosed re-wireable fuses

In March 2010, Standards Australia released a series of Frequently Asked Questions (FAQs) and answers developed by committee EL-001, responsible for the Wiring Rules (2007), to explain some of the issues which have been raised by users of the Standard.

FAQ 14 stated that whenever an addition or alteration is made to a circuit protected by a semi-enclosed re-wireable fuse, the semi-enclosed re-wireable fuse or its fuse element should be replaced with another type of protective device if any of the following three conditions are encountered:

1. whenever the prospective short-circuit current is greater than 1 kA;
2. if the marked current rating of the fuse or fuse element is greater than 69% of the continuous current-carrying capacity of the cable (Iz); or
3. if there is a visible significant deposition of carbon and/or copper on the fuse base or carrier.

It is understood that there are some issues with these requirements, particularly with the first of the above conditions.

At the time re-wirable fuses were installed, they met the standards of the day and, most importantly, were installed on installations with

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significantly lower fault levels than are now experienced. Also, during those times, the Service Protection Devices (SPD) upstream of the main switchboards were predominantly 30A re-wireable cartridge fuses which provided adequate protection for the installations. Nowadays, in many cases, the SPDs are 80A or 100A HRC cartridge fuses and the prospective fault levels are, in most cases, significantly higher than 1kA.

In the future, the fault-levels will increase when network operators upgrade their distribution systems to cope with the increasing loads or replace aging infrastructure.

For this reason,

- semi-enclosed re-wirable fuses can not be used on any new installations; and
- in all cases, when an addition or alteration is made to an existing circuit protected by a semi-enclosed re-wireable fuse, the semi-enclosed re-wireable fuse or its fuse element must be replaced with another type of protective device (such as a circuit breaker). The semi-enclosed re-wireable fuses in the remaining part of the installation need not be replaced unless there is a visible significant deposition of carbon and/or copper on the fuse base or carrier.

It is proposed that the above will be included in the next amendment to the WA Electrical Requirements.

Solar photo-voltaic installations

Recent audits of solar photo-voltaic installations conducted in the eastern states revealed some worrying safety issues[1] with a high percentage of these systems. Incorrect use of AC isolators instead of DC isolators and incorrect wiring of the DC isolating device were identified as two of the most common mistakes encountered on the solar installations inspected.

To give network operators and consumers confidence that solar installations are being properly installed and inspected in WA, Energy*Safety* has recently developed a checklist to assist field inspectors when they are conducting inspections on grid-connected solar PV installations.

For the benefit of electrical contractors engaging in solar installations the following key requirements are provided as a reminder:

- All components of the electrical installation must be properly selected and installed for the application i.e. rating of circuit breakers (OC, SC), installation work practices must be in accordance with the Wiring Rules.
- A weatherproof DC isolator[2] shall be installed immediately adjacent to the array. An AC rated isolator is not suitable for this application.
- A double pole load-break PV array isolator (switch) or a double pole DC rated circuit breaker[2] must be installed adjacent to the inverter. An AC rated isolator/ circuit breaker is not suitable for this application. *Reference: AS/ NZS 5033 Clause 2.5.*
- LV DC cabling must be clearly identified 'LV DC' or similar at least every 3m. *Reference: AS/ NZS 5033 Clause 3.5.*
- IP index of junction boxes must be suitable for the environment. The integrity of the IP rating must be maintained at all times. *Reference: AS/NZS 3000:2007.*
- All cables and wiring must be sized in accordance with AS/ NZS 3000:2007 and AS/NZS 3008.1
- All wiring must be adequately protected from UV damage, e.g. in conduits where exposed. *Reference: AS/NZS 3000:2007 Clause 3.3.2.11.*
- All wiring must be adequately protected from mechanical damage, i.e. in conduits and/ or supported at fixed intervals where accessible e.g. in roof/ ceiling space. *Reference: AS/ NZS 3000:2007 Clause 3.9.*
- The inverter must comply with the requirements of AS 4777 parts 2 and 3. Check details to confirm that the inverter is on the Clean Energy Council's list of approved inverters. (www. solaraccreditation.com.au/ acccec/approvedproducts/ inverters/currentinverters.htm)
- The inverter ideally should be installed outside the building and be accessible to fire and emergency crews (Recommended practice – not yet mandatory).
- The inverter must be IP rated for external use or in a weatherproof enclosure with adequate space and ventilation. *Reference: AS/NZS 3000:2007.*
- An AC isolator/circuit breaker must be installed at the output of the inverter. Reference: AS/ NZS 3000:2007 Clause 2.3.2.
- An AC circuit breaker must be mounted within the switchboard to act as the main switch for the PV system. This switch shall be lockable. *Reference: AS/NZS 47771 Clause 5.3.3.*
- The following signage and labels must be affixed:
  - PV cable junction boxes must be labelled 'SOLAR DC'. *Reference: AS/NZS 5033 Clause 6.2.*
  - A shutdown procedure must be permanently fixed at the inverter and/or on main switchboard. *Reference: AS/ NZS 5033 Appendix G4.*
  - The main AC circuit breaker (within switchboard) must be labelled 'Solar Supply MAIN SWITCH'. *Reference: AS/ NZS 5033.*

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- The grid-supply main switch (from network) must be labelled 'Normal Supply MAIN SWITCH'. *Reference: AS/NZS 5033.*

Figure 2: Typical warning label

- Dual supply labels as per clauses 5.5.2 (a) and 5.5.3 of AS 4777.1 – 2005 shall be installed at the switchboard to which the inverter is connected (including any intermediate switchboards) as required.
- Where the inverter is not adjacent to the main switchboard, inverter location information must be provided.
- Fire Emergency information must be permanently fixed on the main switchboard: 'SOLAR ARRAY ON ROOF'. This should include PV array Voc and Isc ratings. *Reference: AS/NZS 5033 Clause 6.4*

- It is also strongly recommended that all exposed conductive parts and frames of solar photovoltaic arrays, including any structural metalwork (e.g. module frames, structures) be bonded to earth. This can be achieved by connecting the earthing conductor with a minimum cross-sectional area of 4mm^2 directly or via the inverter to the installation's earthing system (Fig 1). It is anticipated that the new version of AS/NZS 5033 will include this as a requirement.

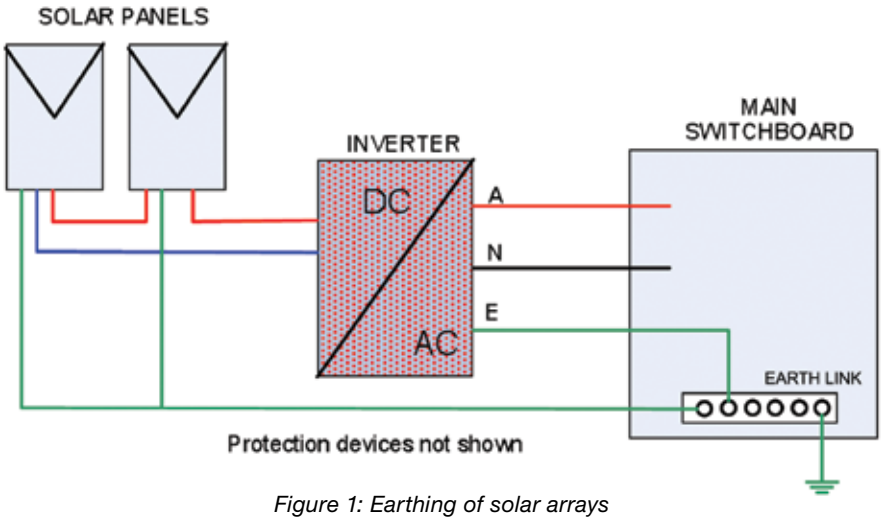

Figure 1: Earthing of solar arrays

Note:

1. *A high percentage of installations audited in Victoria were found to have incorrect isolating switches installed, i.e. incorrect use of AC isolators instead of DC isolators. 28% of installations inspected by the Department of Climate Change DCCEE (Commonwealth) were deemed hazardous and shut down. 73% of these had the same defect – "incorrect wiring of the DC isolating device".*
2. *Extra care should be taken when connecting double pole DC isolation/disconnection devices, especially if polarised DC circuit breakers are being used. It is critical to ensure that they are wired correctly since 'incorrect polarity' on these devices is a serious fire hazard. If unsure, electrical contractors should refrain from using polarised DC circuit breakers. It is anticipated that the new version of AS/NZS 5033 will prohibit polarised breakers.*

Review of AS/NZS 5033: 2005

AS/NZS 5033: 2005, Installation and Safety Requirements for photo-voltaic (PV) arrays are currently being reviewed by committee EL-042. A draft of the proposed new standard is currently available for download at www.saiglobal.com.

Comments are being invited on the draft. If you wish to make any suggestions, please go to the above website for instruction on how to do so.

Prosecutions for breaches of electricity legislation 1 April to 31 May 2011

Name (and suburb of residence at time of offence)	Licence No.	Legislation and Breach	Offence	Date of Offence	Fine ($)	Court Costs ($)
David Jonathan Dunnings (Byford)	EW111598	E(L)R Regulation 49(1)	Carrying out unsafe and substandard electrical work	27/05/09	7,000.00 *	879.70 *
David Dilley (Broomehill)	EW130755	E(L)R Regulation 49(1) (2 breaches)	Carrying out unsafe and substandard electrical work	06/11/09	4,000.00 *	119.20 *
Paul Maindok (Kalbarri)	EW104618	E(L)R Regulation 49(1)	Carrying out unsafe and substandard electrical work	04/11/08	2,000.00 *	2,000.00 *
Steven McMullen (Hillarys)	EW144099	E(L)R Regulation 49(1)	Carrying out unsafe and substandard electrical work	Between 01/03/09 and 25/03/09	5,000.00	649.70
Ivan Tanevski (Marangaroo)	EW140455	E(L)R Regulation 49(1)	Carrying out unsafe and substandard electrical work	07/03/09	4,000.00	649.70
Gordon Martin (Girrawheen)	EW124837	E(L)R Regulation 50(1)	Failed to provide adequate supervision for an employed electrical apprentice	19/05/08	500.00	1,500.00
Shane Willis T/As Shane Willis Electrical Contracting (Broome)	EC005101	E(L)R Regulation 51(1) (2 breaches)	Failed to submit a Preliminary Notice to the Network Operator	Between 29/02/08 and 06/09/09	4,000.00	649.70
		E(L)R 1991 Regulation 52(1) (2 breaches)	Failed to submit a Notice of Completion to the Network Operator on completion of the electrical installing work			
David Jonathan Dunnings T/As Electrical Service (Byford)	EC002108	E(L)R 1991 Regulation 52(3)	Sending notice of completion of notifiable work in relation to uncompleted work	27/05/09	*	*
Eircom Electrical & Data Pty Ltd T/As Eircom Electrical & Data (Hannans)	EC007705	E(L)R 1991 Regulation 52(3)	Sending notice of completion of notifiable work in relation to uncompleted work	Between 01/03/09 and 25/03/09	*	*
Ivco Electrics Pty Ltd (Marangaroo)	EC008441	E(L)R 1991 Regulation 52(3)	Sending notice of completion of notifiable work in relation to uncompleted work	07/03/09	2,000.00	300.00
Paul Maindok (Kalbarri)	EC005187	E(L)R 1991 Regulation 52(3)	Sending notice of completion of notifiable work in relation to uncompleted work	04/11/08	*	*
Delmar Pty Ltd T/As Beresford Electrical Services (Webberton)	EC000308	Regulation 63	Failing to report an electrical accident	05/03/09	4,000.00	649.70

Legend NLH No Licence Held
E(L)R *Electricity (Licensing) Regulations 1991*
* Global Fine or costs issued

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gas focus

Is the storage water heater on a flat and level surface?

A gas fitter recently received a Notice of Defect for a non-compliant gas installation after installing a gas storage water heater. Feeling aggrieved by this, the gas fitter appealed to Energy*Safety* to review this matter.

The non-compliance related to the installation of a gas storage water heater sitting on a slotted re-enforced 'Poly Slab'. This was initially seen as a replacement for the concrete slab, as 50mm thick concrete slabs are no longer readily available. A plastic manufacturer has recognised the need to provide a solution producing this alternative.

Unfortunately in this case, the manufacturer's installation instructions for the gas storage water heater require the water heater to stand on a flat and level ***fire proof base***. This 'Poly slab' being manufactured from plastic does not meet this requirement. Until the manufacturer of the 'Poly Slab' adds a fire retardant in the ingredients prior to moulding and then performs appropriate tests to demonstrate compliance, plumbers/gas fitters are not to use these 'Poly Slabs'.

Poly Slab

Prior to installing any gas storage water heater, please check the installation instructions as this requirement (***fire proof base***) only applies to one manufacturer.

Multiple asbestos flue systems in blocks of flats and apartments

In the early seventies, Perth experienced a growth in population. Developers responded opening up new suburbs and building many homes in the outer metropolitan area. We also witnessed a growth in rental accommodation with large blocks of flats and apartments being built.

As there was a plentiful supply of Natural gas available to consumers in Perth it was the preferred choice of energy for cooking and water heating. In large blocks of flats and apartments small instantaneous gas water heaters were installed with a number of these being connected on multiple asbestos flue systems, with vertical flues running in the plumbing ducts or on the side of the building. Some water heaters were also concealed in these ducts.

A number of the flats and apartments have since been purchased from the original owners, in some cases as an investment property. Over the years, kitchens and bathrooms have been modernised including upgrading the water heaters. The original water heaters had an input of 40 MJ/hr and the multiple flue systems were designed to support this load. However, the original water heaters are no longer available and have been replaced with water heaters with an input of 80MJ/hr, twice the original gas input, and are overloading the flue system.

These larger water heaters have subsequently been connected into the existing flue systems. Poor installation methods have resulted in damaged or dislodged flue spigots and in some cases the vertical flue has collapsed rendering the whole of the flue system unserviceable (see accompanying images).

There are very few alternatives available other than gas, as a replacement system. Any electrical replacement is ruled out under the Minimum Energy Performance Standards (MEPS). The internal building wiring would require upgrading, together with the external distribution system in the street, the cost of this borne by the consumers.

Having to replace asbestos products requires an occupational license and all buildings of this vintage would need to have an up to date building asbestos register.

Energy*Safety* together with the gas suppliers will be requiring these systems to be replaced to ensure the gas installations remain safe and compliant. Propriety twin skin metal flue systems are considered a viable replacement for the asbestos system.

For any further information regarding the replacement of these multiple flue systems please contact the Gas Inspection Branch at Energy*Safety*, telephone 9422 5297.

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Gas Industry Roadshow

The Gas Industry Trade Expo held on the 16 March 2011 at Ascot Racecourse, launched the updated Australian Standards AS/NZS 5601: 2010, Gas Installations, included information on National Licensing and the recent changes to gas industry legislation.

The Gas Industry Roadshow that followed visited the major town centres in the southern portion of Western Australia during April and May this year.

In July the Roadshow will head north to the towns of Karratha, Port Hedland and Broome. The locations, dates and times are as follows:

- Karratha: 19 July (Karratha Country Club, Searipple Drive)
- Port Hedland: 20 July (All Seasons Resort, Lukis Street Pt Hedland)
- Broome: 21 July (Roebuck Bay Hotel, Carnarvon Street Broome)

All venues will open at 5:30pm for registration, the presentation commencing at 6:00pm and concluding with light refreshments around 8:00pm.

Invitations will be mailed to gas fitters/plumbers who reside in these areas, together with an SMS reminder the week before the events.

Gas industry sponsors will also accompany Energy*Safety* gas inspectors to make these events even more beneficial to attend.

Woodman Point Treatment Works

Recycling takes on a new meaning in one small sector of the gas industry. The recent commissioning of a gas hot water heater completes the gas installations, which were part of a major upgrade at the Water Corporation's Woodman Point Wastewater Treatment Plant in Perth's Southern Suburbs.

Independent Type B Gas Inspectors ensured the three Waukesha V16 engines and the hot water heater comply fully with the Australian Standards AS 3814, Industrial and commercial gas-fired appliances. These gas appliances are unique insofar as the three engines and the hot water heater are primarily fired on biogas produced in the wastewater treatment plant's three large egg-shaped concrete structures, which are known as digesters.

Settled solids from the Primary Sedimentation tanks (one part of the overall treatment process) is pumped into the digesters and allowed to ferment, the process being enhanced by heating to 37°C with hot water produced from the heat exchangers installed on the three engines and when required from the hot water heater.

The methane gas produced in the digesters has a heating value of approximately 20MJ/M^3 (approximately half that of natural gas). Due to some included particulates and pollutants the gas is scrubbed and pumped into a nearby gas holder. The gas holder stores the gas and delivers it to the engines and water heater at 5kPa. The power generated from the gas engines provides approximately 50% of the plant's electrical needs. Any excess methane produced is flared-off in towers adjacent to the gas holder.

Providing the wastewater continues to flow, the plant continues to run.

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A useful by-product of the process are bio-solids – a treated organic material suitable for use as a soil conditioner and chemical fertilizer replacement for many land-based applications.

A supply of natural gas is provided to the plant to enhance the operation of the Type B gas appliances as required. The burner on the hot water heater is dual fuelled natural gas/biogas, with biogas being the preferred fuel on site.

The gasfitting work on site was completed by Class I gas permit holders and the installation of the gas appliances undertaken by supervised gas fitters working under an Authorisation.

Sino Iron Power Station

The Sino Iron Power Station at Cape Preston has recently achieved the first firing of the seven gas turbines involved in the project. The power station is owned and operated by CITIC Pacific Mining (CPM), and is being constructed and commissioned by several subcontractors under the management of UGL Infrastructure.

The power station is designed to supply the power requirements of CPM's Sino Iron Mine site, which is one of the largest infrastructure projects in Australia. The Sino Iron project will mine magnetite iron ore, rather than the hematite iron ore that is traditionally mined in Western Australia. Magnetite requires beneficiation before it can be exported for use in the steel making process and is a desirable quality product for steel mills, including those that CPM has in China. When in full operation, the mine and supporting services on site will have a large energy demand, which will be provided solely by the on-site power station.

The 480 MW power station consists of seven Siemens SGT800 Gas Turbines (550 GJ/h each natural gas consumption); six AE & E Australia Pty Ltd designed Heat Recovery Steam Generators (HRSGs) with auxiliary duct firing, and three Shin Nippon Steam Turbines. The plant is organised into three major power blocks, each consisting of two gas turbines, two HRSGs and one steam turbine. The gas turbines in each of these blocks are able to be operated in open cycle or combined cycle mode, and the gas burners on the HRSGs will provide additional steam for the steam turbine generator to convert into electricity.

For security of operation, the two gas turbines in the first block are able to be fired on liquid fuel as well as gas. The seventh gas turbine will operate in open cycle mode only, but it is able to be converted into a combined cycle with minimal modification required.

The power station will utilise gas from the North-West shelf delivered through a lateral connected to the Dampier to Bunbury Natural Gas Pipeline. The Type B gas appliance inspector is Martin Ritchie of BMS Oil and Gas Services and the gas commissioning was done by Lawrence Pritchard of Thermal Systems.

Sino Iron Power Station, Cape Preston

Maintain and service type B gas appliances

Some misunderstanding has arisen in the gas industry as to whether a consumer is required to maintain and service a Type B gas appliance in accordance with the requirements of Australian Standard AS 3814, Industrial and commercial gas-fired appliances, Appendix G: Maintenance and checks of safety devices.

The misunderstanding has arisen since AS 3814 refers to Appendix G and Appendix J: Typical field check list, as being 'informative'. The preface of the Standard states that an 'informative' appendix is only for information and guidance.

There are also other clauses in AS 3814 referring to maintenance, for example, clause 3.4.1.2: Interlock to be tested. This clause states that an interlock and limit device should be tested periodically over the life of the equipment with which it is associated and refers to Appendix G for the maintenance schedule.

The Appendix G, clause G2: Regular Testing effectively requires that regular inspection, together with programmed maintenance and testing of safety devices is essential to ensure safe and efficient operation of gas fired equipment and should be carried out on an annual basis. More frequent testing is to be determined by the reliability of the device and recommendations of the safety device manufacturer, the appliance manufacturer or installer with minimum testing and maintenance intervals set in consultation with a registered gas fitter. Where appliances are fitted with a programmable electronic system base burner management and safety system, the testing frequency of critical interlocks and

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limit devices is dictated by the safety integrity level evaluation.

Regulation 36(4A) of the Gas Standards (Gasfitting and Consumer Gas Installations) 1999 states the following:

> *If a consumer's 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.*

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 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 Australian Standard, AS 3814 in Western Australia.**
- **In particular, AS 3814, clause 3.4.1.2, Appendix G, Appendix J and any other reference therein to maintenance and servicing (whether it is advisory or informative) are mandatory.**

The Certificate of Compliance form and the compliance plate have consequently been revised and now include a statement on 'Servicing' that reflects the current requirement of Regulation 36(4A) of the regulations.

Changes to the Certificate of Compliance for Type B gas appliances

Energy*Safety* will soon introduce a revised Certificate of Compliance for use on industrial and commercial gas installations in Western Australia. The new Certificate of Compliance is identified by the code ESWA G057 0611 at the bottom right hand corner of the certificate.

The revised Certificate of Compliance will replace the current Certificate of Compliance [ESWA G057 0509].

The revised Certificate of Compliance now includes the nominal gas consumption (MJ/h) and a statement on 'Servicing' that reflects the current requirement of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999, regulation 36(4A). The previous certificate's paragraph that referred to the issue of a Certificate of Compliance not diminishing the responsibility of the gas appliance manufacturer, installer or operator for ensuring the appliance functions, and continues to function, safely and efficiently has now been replaced with the following paragraph that refers to 'Servicing':

> ***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)].***

The current Certificate of Compliance will be phased out after July 2011. A phased out approach will apply to the remaining stocks of Certificate of Compliance books held by Energy*Safety* and Type B gas appliance inspectors.

Changes to the compliance plate for Type B gas appliances

Energy*Safety* will soon introduce a revised compliance plate for use on industrial and commercial gas installations in Western Australia. The new compliance plate is identified by the code ESWA G052 0511 at the bottom right hand corner of the plate.

The revised compliance plate will replace the current compliance plate ESWA G052 0506 and is of the same colour and size.

The revised compliance plate now includes a statement on 'Servicing' that reflects the current requirement of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999, regulation 36(4A). The previous plate included a paragraph that referred to 'Essential Maintenance'. This has now been replaced with the following paragraph that refers to 'Servicing':

> ***Servicing: 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)].***

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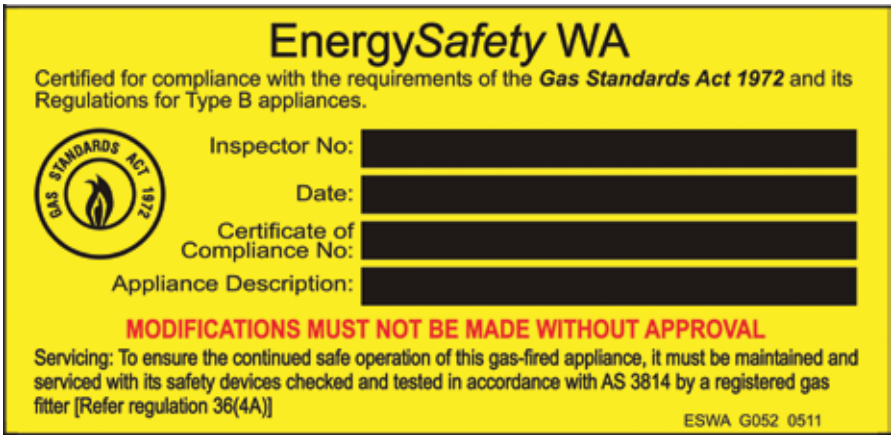

Type B gas appliance compliance plate

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The current compliance plate will be phased out after June 2011. A phased out approach will apply to the remaining stocks of the compliance plates held by the Licensing Centre and others.

Gas water heater zapped

The online auction or shopping website, eBay, promptly removed an uncertified and unapproved gas water heater advertisement that was previously on their website in response to an Energy*Safety* Law Enforcement Service Request.

The eBay Fraud and Investigations Team was contacted by Energy*Safety* after a complaint was received from a local consumer about a water heater that he had purchased.

The consumer had apparently requested a registered gas fitter to install the appliance in his Fremantle flat refurbishment, but the gas fitter had rightfully declined, as the appliance was not marked with a badge or label indicating that it was a Type A gas appliance currently approved for installation.

The NSW based supplier (Dreamrider Pty Ltd) of the 16L and 20L Rio Grande hot water heaters subsequently contacted Energy*Safety* for an explanation as to why their advertisement had been removed. They were advised that it is an offence under the *Gas Standards Act 1972* to sell, hire or use in WA a gas appliance without meeting the approval requirements of the Director of Energy Safety and having the appliance badged*.

Consumers and gas fitters are requested to advise Energy*Safety* (energysafety@commerce.wa.gov.au) if an advertisement by an Australian supplier is noticed on eBay or any other online auction or shopping website that has gas appliances which are not badged by any of the following recognised certifying bodies:

- The Australian Gas Association (AGA);
- SAI Global;
- IAPMO Oceana; or
- Global-Mark.

*Note: Series or mass-produced Type A gas appliances that are not badged by a recognised certifying body can not be sold, hired or used in WA [Clause 501 of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999].

Performance based design requirements (AS/NZS 5601)

With the recent publication of the joint Australian and New Zealand Standard, AS/NZS 5601, Gas installations, there is now another compliance method included. This alternative method is the performance based design requirements available under section 2. This is in addition to the 'means of compliance' that is also covered in this Standard and was the only method of compliance covered in previous editions (AS 5601 and AG 601).

Performance based design requirements

The performance based design requirements method is based on the 'work to be performed', as opposed to the 'manner in which the work is to be performed' or 'prescribed' or 'Means of compliance'.

The performance based requirements (PBR's) describe the required results and provide criteria for verifying whether or not these results have been met. They do not state the methods for achieving the desired result.

A performance based standard states goals and objectives to be achieved and describes methods that can be used to demonstrate whether or not products and services meet the specified goals and objectives. A prescriptive standard typically prescribes materials, design and construction methods frequently without stating goals and objectives. A performance based standard focuses on desired characteristics of the final product, service or activity rather than the requirements for the processes to produce it.

The PBR allows mechanical or hydraulic engineers, architects, plumbing designers and the like in conjunction with the installing gas fitter to determine the best way to achieve a safe outcome. The responsibility for the outcome however belongs to the gas fitter.

There is a world wide effort to move towards performance based standards and codes. PBR's are commonly used in the military for procurement, have been

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Comparative example: the table shows comparisons of the two methods for a flexible connection in the gas supply to a turbine.

Performance based requirement	***Means of compliance requirement***
Flexible connections shall be leak-free for the intended service, pressure tested at 1.5 times the operating pressure and routed in such a way that they are capable of withstanding the operating pipe stresses likely to be induced by vibration, thermal expansion, earthquake or sustained load without leaking.	*Flexible connections shall comply with the requirements of either of the following standards: AS/NZS 1869, ASTM F1120, BS 6501 Part 1 or ISO 10380.*

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used in the Building Code of Australia for building construction for many years, are used in the American NFPA fire codes and in WA variation/exemptions and continue to be used in recent Australian gas standards, such as AS 3645: Essential requirements for gas equipment.

The PBR allows for innovation and the use of new products and methods provided safety requirements are achieved. The PBR requires that the level of safety shall not be less than that done by the 'Means of Compliance'. The 'essential' requirements, that must be complied with are contained in section 2 of each part of the Standard, whether the gasfitting work is 'Performance Based', or done by the 'Means of compliance'. The PBR can be chosen by the gas fitter rather than the 'means of compliance'.

Proof of compliance

If a PBR is to be used, then proof of compliance must also be provided as follows:

1. Consult with Energy*Safety* and the gas supplier before commencing work.
2. Provide a written design specification and drawings.
3. Obtain verification of design as being compliant with the essential requirements by a suitably qualified professional engineer.
4. Provide justification for the deviation from the 'means of compliance'.
5. Obtain confirmation from the installation owner acknowledging the departure from the 'means of compliance'.
6. Obtain verification of the 'as built' installation before commissioning.
7. Documentation for the installation is to be retained by the installation owner for at least seven years.

Means of compliance

As noted above, the 'means of compliance', 'manner in which the work is to be performed' or 'prescribed requirements' are also covered in AS/NZS 5601 and are:

- Covered in the Standard, sections 3 to 6 of Part 1 and sections 3 to 9 in Part 2.
- 'Deemed to comply' with the 'Performance Based' requirements of section 2 without further evidence being required.
- Similar to what was the only method available in the previous editions of the Standard (AS 5601 and AG 601).

Conclusion

There are now two methods of compliance available in AS/NZS 5601. The 'Means of compliance' method can continue to be used by a gas fitter and gives clear guidance on what is required, but does not allow for the use of suitable innovative products that may be available. However, the 'Performance based requirement' method can be used which allows the gas fitter to use any suitable products, but requires calculation and testing for proven solutions.

Recognition of the Polytechnic West Automotive training course, service and repair of CNG fuel systems for a restricted class E permit

Energy*Safety* has now recognised the Polytechnic West Automotive training course, which includes service and repair of CNG fuel systems, as forming a suitable prerequisite for the training qualification requirements for a Class E permit restricted to servicing and repair of CNG mobiles in Western Australia.

The decision reached by Energy*Safety* was based on the apparent need for separate service (service and repair) permits; particularly for those Class E gas fitters working in the service side of the CNG forklift and vehicle (with factory fitted gas systems) industries, but not working in the installation side of these industries.

To offset a work experience requirement for servicing, prerequisites for trainees undertaking the training course are imposed. These prerequisites include:

- having a Certificate III or higher in automotive studies;
- relevant and long term automotive industry experience;
- significant experience and underpinning knowledge of Occupational Safety and Health in the automotive industry;
- being of mature age; and
- having a practical knowledge of automotive tools with a high level of hand skills.

The automotive training package installation unit of competency does still however require completion of work experience.

As part of the training course, Polytechnic West has developed an online flexible learning facility using the Moodle Library Resource which allows staged access for trainees to units/modules within the course and has practical institutional assessment conducted.

A person successfully completing the training and assessment, issued with a Completion Certificate will be deemed to have an adequate theoretical and practical knowledge and adequate skills and knowledge of the *Gas Standards Act 1972* and the Regulations required for licensing purposes. An application including a Completion Certificate may be made to the Energy*Safety* Licensing Centre

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for a Class E Permit restricted to service and repair.

Polytechnic West is proposing to conduct a CNG Gas course on a block (five day/week) basis from 5 – 9 December 2011 at their Carlisle Campus. The contact person at Polytechnic West for starting dates and course details is Amanda Dowling, phone 9374 6111 (Monday to Wednesday), 9267 7425 (Thursday) or email amanda.dowling@polytechnic.wa.edu.au.

Revoking of some generic/global variation/exemptions

With the recent publication on 23 December 2010 of the joint Australian and New Zealand Standard, AS/NZS 5601, Gas installations, there is now coverage of some previously issued generic/global variation/exemptions.

The particular amendment to the regulations that incorporated AS/NZS 5601 was published on 18 January 2011. Regulation 32(4) of the regulations now allows a six month transitional provision from the date of gazettal, with this period expiring on 19 July 2011.

After this date, the following generic/global variation/exemptions numbers are revoked:

- GV/E 10/01 for a stainless steel piping connection system.
- GV/E's 08/70, 08/17, 07/06, 06/54 and 06/32 for multilayer (composite) piping system sizes greater than 25mm.
- GV/E's 08/18, 07/16, 06/19 and 06/08 for range hoods.
- GV/E 07/03 for a fan assisted continuous flow water heater with a sideways flue diverter.
- GV/E 06/16 for a copper piping connection system.
- GV/E 04/11 for consumer piping pressure testing to 4 kPa (with gas meter outlet pressure of 2.75 kPa) and 2 kPa (with gas meter outlet pressure of 1.25 kPa).

In conclusion, the previous variation/exemptions applied to gas installations completed during the transitional period under AS 5601, Gas installations are now revoked and all gas installations after 19 July 2011 must be in compliance with the requirements of AS/NZS 5601.

The document *Generic or Global Variation/exemptions for Domestic/commercial/mobile installations*, available on Energy*Safety*'s website (www.energysafety.com.au), has been amended to reflect this change.

Prosecutions for breaches of gas legislation 1 April 2011 to 30 June 2011

Name (and suburb of residence at time of offence)	*Licence No.*	*Legislation and Breach*	*Offence*	*Fine ($)*	*Court Costs ($)*
Daniel James Williams (Eaton)	*NLH*	*GSA 13A(2)*	*Carried out gasfitting work while not holding a certificate of competency, permit or authorisation allowing him to do so.*	*5,000.00*	*649.70*

Legend NLH No Licence Held
GSA *Gas Standards Act 1972*
GSR *Gas Standards (Gasfitting & Consumer Gas Installations) Regulations 1999*