Message from the Technical Regulator:

Welcome to Issue 39 of Regulation Roundup which has again been packed full of information that we hope will be useful to the industry.

The highlight in this edition is the commencement of the Electronic Certificate of Compliance (eCoC) system. We have already had many contractors and workers register and use the system. We trust that once people get familiar with the system it will save time and money for the industry by streamlining the way we all handle certificates.

It is also worth noting that we are gearing up for our 2017 series of Roadshows. Once again, I highly recommend that you get along to one of our sessions as they always provide the opportunity for the OTR to interact with industry.

The Roadshows have been spread across a wide geographic area to make it as easy as possible for everyone across the state to attend.

I encourage you to have a read of this edition of Regulation Roundup. Finally, I would like to wish you all every success for 2017.

Robert Faunt, Technical Regulator

Make sure your apprentice is registered with CBS

Apprentices learn so many valuable skills through their training and on the job experience, and they often look to their employer and workmates for helpful advice. One area that apprentices often need some assistance with is obtaining the required registration.

All plumbing, gas fitting and electrical apprentices must be registered as a restricted worker before they can commence any on-site work. As an employer, it is also your responsibility to ensure that all your staff are appropriately registered, otherwise you could be in breach of the Plumbers, Gasfitters and Electricians Act 1995. You risk being fined and there may be cause for disciplinary action on your own licence.

It is advisable to check the registration records of all staff that perform work, to note the renewal date, and to ensure that staff are correctly registered at all times while they are working for you.

To obtain a restricted worker registration:

• The person must be a registered apprentice under a Contract of Training, through Regulation and Contract Management (RCM - which is part of the SA Department of State Development).
• RCM will advise Consumer and Business Services (CBS) when an apprentice is registered and CBS will then email and SMS instructions to the apprentice to have their photo taken so that they can be issued with a registration card.

Sometimes apprentices overlook the requirement to have a photo taken, which means that the registration cannot be processed and the apprentice is unable to legally work on-site.

Once a photo is provided, the registration can be processed and a registration card issued. There is no fee for apprentice registration.

Further information is available from CBS by visiting cbs.sa.gov.au, phoning 131 882 or by emailing occupational@sa.gov.au

Electronic Certificates of Compliance are now available

The Office of the Technical Regulator (OTR) is pleased to announce that the new electronic certificate of compliance (eCoC) system is now available. This represents a key change to the way the gas, plumbing and electrical industries certify compliance and will bring many benefits to industry and the general public.

Contractors and workers from the electrical, gas and plumbing industries can now access the eCoC system through the internet at sa.gov.au/otr/ecoc

The eCoC system is the result of many months of work, and has been well received...
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by industry stakeholders. It represents an exciting change for the gas, plumbing and electrical industries which will lead to improved business efficiency, and better customer service as well as making it easier to demonstrate compliance.

The eCoC system is fully accessible on a tablet or smartphone, and has benefits for your business, your customers and the OTR as the regulators.

### Create and submit and manage eCoCs

The main function of the eCoC system is the creation, submission and management of electronic certificates of compliance. This includes an interface that allows you to complete the details of the owner or operator of the installation, the work performed and defects or risks discovered during the course of the work. In addition, you also have access to a dashboard through the **My eCoCs** section. This dashboard allows searching, and ordering of any eCoCs that you have been involved with – whether this be as a contractor, a worker or both. Once you have completed an eCoC, the system can email it directly to the customer. It will also email you an easily printable pdf copy in case you need to produce a hard copy of the certificate. Copies of the eCoC can also be forwarded by email to others through the system.

### Signing an eCoC and licences

The OTR has made an arrangement with Consumer and Business Services (CBS) which allows the eCoC system to determine that a worker or a contractor is licenced, and which industries their licence permits them to work in. This allows the system to know who can enter the details of the work, and who is signing the certificate as a contractor.

### Features for contractors

The eCoC system has several features that were developed with contractors in mind. These include the ability to manage your workers through the **My Workers** section, as well as the ability to create accounts for non-licence holders in your business. At your option you can create accounts for admin staff – who receive read-only access, or for your supervisors who can view and sign eCoCs on your behalf as your duly authorised agent.

### Connections to electricity distribution networks

The eCoC system provides an efficient way to certify your work and to provide a certificate to your customers. When you are connecting or reconnecting an electrical installation to an electricity distribution network you also need to give a copy to the network operator.

Previously you may have placed the network operator copy of the certificate behind the meter box so the connections officer could retrieve it and make the connection. When you use an eCoC you will still need to provide a copy to the network operator so make sure you have a way to print the certificate, or use a paper certificate.

The OTR continues to work with network operators to make sure you can get the power connected for your customers as we move towards certifying compliance electronically.

### Paper forms to be discontinued by 1 July 2018

To allow industry to adjust their business processes to accommodate electronic compliance certificates, there will be an 18 month transitional period away from the existing paper certificates of compliance. During this period – which ends 30 June 2018 – you may use the existing paper forms or the new eCoC system at your option. From 1 July 2018 onwards the eCoC system must be used.

For further information go to [sa.gov.au/otr/ecoc](http://sa.gov.au/otr/ecoc) or contact the OTR at otr.ecoc@sa.gov.au
NECA 2017 Roadshow Seminar Series

Calling all Electricians!
NECA SA will be running their 2017 Roadshow Seminar Series across South Australia in March and April and we encourage all electrical contractors and workers to attend and find out the latest developments within the industry. The seminars will cover, in detail, the new AS/NZS 3000 Wiring Rules, set to be released in mid-2017.

The seminar series is a significant training resource for our industry. The event this year is designed to provide licensed electricians with a greater understanding of the following topics:
- NECA on the release of the Technical Knowledge Base (TKB)
- Roxel Australia on their Smart-Van initiative
- Office of the Technical Regulator on the new AS/NZS 3000 Wiring Rules, Connection of generator sets by socket and lead and Electronic Certificates of Compliance.

Thanks to the Office of the Technical Regulator, SA Power Networks and Roxel Australia for their support and involvement in this initiative.

NECA have once again nominated Mates in Construction to be our charity of choice for the 2017 Roadshow Seminar Series. There will be donation tins available at each seminar, and more information will be provided on MIC, the fantastic work they are doing for the construction industry and why they need our help.

Suppliers, manufacturers and wholesalers will be on location with their new products and service displays and NECA SA staff will also be on hand to answer your questions in regard to what NECA can do for you and your business.

To attend the NECA 2017 Roadshow Seminar Series, please complete the registration form enclosed in this edition of the Regulation Roundup at least 7 days prior to your chosen event and send to NECA SA via fax on (08) 8373 1528 or email neca@necasa.asn.au

For further information please phone NECA SA on (08) 8272 2966 or visit www.neca.asn.au/sa

New edition of AS/NZS 3010:2017 - Electrical installations, generating sets

It is anticipated that a revised edition of AS/NZS 3010 will be published in June/July of 2017. AS/NZS 3010 sets out the minimum safety requirements in relation to the connection of generating sets to an electrical installation for the purpose of supplying electricity at low voltage (not exceeding 1000 V a.c or 1500 V d.c.)

The new edition has been expanded to include:
- More information along with many drawings showing the typical connection arrangements for generators, more than any previous editions of the standard. The drawings are in colour to assist with identifying the conductors.
- The inclusion of a section that caters for the connection of plug in generators either for portable electrical equipment or connection to an electrical installation.

Prior to purchasing a generator for your customer or advising a customer on the purchase of a generator, or when engaged to install a generator that has already been purchased by your customer, the first consideration is what is the generator to be used for.

Will it be:
- An alternative or supplementary supply to an electrical installation, to be used when normal supply (the distribution system) is not available, or
- A grid connected co-generation arrangement, or
- A stand-alone arrangement where the generator is the principal source of supply, and the electrical installation is not connected to the distribution system, and
- Used to supply electrical equipment such as TVs, DVD players, phones and some kitchen appliances which may contain sensitive electronics, or
- A portable supply to electrical equipment, such as power tools, and
- Permanently connected or connected by socket and lead?

All of these scenarios have been described in various clauses and figures in the standard. All you need to do is select the appropriate clause and figure that suits the intended application.

Before commencing work on the connection of a generator you must ensure that your customer has not purchased the wrong type of generator for the intended application. Explaining to your customer upfront that they have purchased the wrong generator is also a lot easier than having to explain to them later why it keeps tripping out, or why their new television does not work anymore. When selecting a generator it is important to purchase one that is suitable for the intended load.

If the generator is to be used to supply electrical equipment such as TVs, DVD players etc. which contain electronics such as microprocessors, it is essential to use an inverter generator. With an inverter generator, the AC alternator is connected to a rectifier that converts the AC power to DC. The DC power is then inverted back into clean AC power of the desired frequency and voltage. The result is much purer sine waves than is possible with a conventional generator, essentially the same quality of electricity that you typically get from your electrical distribution system. Using power that isn’t “clean” can make these devices malfunction, or even damage them.

Generators to be used as an alternative or supplementary supply shall not have an MEN connection in the generator, nor an RCD. Installing an MEN connection in the generator along with the required MEN connection within the electrical installation switchboard will cause the RCD to continually trip as this parallels up the neutral and earth conductors between the generator and the electrical installation. Doing so causes the generator earthing conductor to carry some of the load current, which is not permitted by the Wiring Rules. Some generators have the facility to disconnect the MEN within the generator. If that is the case, it is acceptable to do so however disconnecting an RCD that comes installed in the generator may void its warranty.

One of the most common questions is whether the generator neutral should be switched by the changeover device when connecting a generator. In the new edition you will notice that the neutral switching has been removed from almost all figures where the generator has been permanently connected to an electrical installation. The reason why neutral switching has been removed from those figures is because the industry, like us, was confused.

AS/NZS 3010:2017 Clause 2.7.2 Operation will say:
(c) Neutral switching
Where the MEN system of earthing is used, changeover devices shall not disconnect the neutral conductor of the incoming normal supply at the main switchboard where the MEN link is provided.

This aligns with the requirements in AS/NZS 3000:2007, which says:
Clause 2.3.2.1.1 Alternating current systems
Requirements for isolation of conductors in alternating current systems shall be as follows:
(b) Neutral conductor
(i) No switch or circuit-breaker shall be inserted in the neutral conductor —
Where the neutral conductor is used as a combined protective earthing and neutral (PEN) conductor for protective earthing of any portion of an electrical installation. Even though the neutral switching in the Figures in the current edition of AS/NZS 3010 were not switching the PEN conductor, the fact that the generator supply neutral was shown switched confused the issue, and some contractors ended up switching the PEN conductor by mistake. The new edition of AS/NZS 3000 will have a definition for a PEN conductor.

AS/NZS 3000:2017 Clause 1.4.100 will say:

**Protective earth neutral (PEN)**

Neutral and protective earth functions combined in a single conductor. The most common type of a PEN conductor you will come across is the neutral in a consumer mains. That neutral is connected between a neutral link containing an MEN connection on the main switchboard, and the neutral of the distribution system, which also contains an MEN connection. The next most common PEN conductor is where there are a string of outbuildings, each with its own MEN connection installed at the switchboard in each outbuilding. In that scenario the submain neutral is also a PEN conductor, connected from the neutral link containing an MEN connection in the 1st switchboard, to the neutral link containing an MEN connection in the 2nd switchboard and so on. The only other type of PEN conductor that you may come across is with MIMS (mineral insulated metal sheathed) cables, commonly known as pyrotenax or “pyro” cables. MIMS cables may use the ESR (earthed sheath return) system, where the neutral and earth are connected together at each end of the metal sheath of the MIMS cable, and the sheath is used as a PEN conductor. So, in short, a PEN conductor is basically a neutral cable that runs from one MEN’d neutral connection to another MEN’d neutral connection. The generators in AS/NZS 3010 do not contain an MEN connection at the generator, so the cable from the MEN’d neutral link to the generator is just a supply cable neutral.

The two main reasons why a PEN conductor shall not be switched are:

1. **Physical isolation between the generator and the normal supply (distribution system)**
2. **You will have created a very high fault loop impedance path, too high to operate any protective devices should an active to earth fault occur.**

The generator supply neutral, however, shall be switched where the generator is being used as an alternative supply, and where the generator connection is made by a socket and lead. Switching out the generator supply neutral in the changeover device ensures that the neutral pin of the appliance inlet socket does not become a live conductor whilst the lead to the generator is removed.

Due to the recent blackouts we have been inundated with calls in relation to generators to be connected by socket and lead as an alternative supply, so hopefully this will answer all of your questions regarding this.

When connecting a generator with a socket and lead as an alternative supply to an electrical installation there are some fundamental electrical safety principals that shall be achieved, in addition to the requirements of AS/NZS 3000. These include but are not limited to:

**AS/NZS 3010:2017 Clause 2.7.10.1 In Australia will say:**

**Changeover device in the generator neutral**

In Australia only, a changeover device switching contact in the generator set neutral connection is not the recommended connection method for generating sets that are permanently connected to any switchboard. However, when a changeover device is fitted in a generating neutral connection, the neutral connection shall not disconnect the connection to the main switchboard MEN link connection (see Figures 2.3 to 2.9 in AS/NZS 3010:2017).

So, rather than show the generating supply neutral switched in the figures, and then hope that contractors read the words in the above clauses, we have simply removed the generating supply neutral switching from the Figures, and the clauses give the explanation. As we know, some of you will go straight to the Figures in this standard, and not necessarily read the words in the clauses.

**Figure 4.2 Typical three pole/four pole manual changeover arrangement for a three phase portable generating set with three pole local isolation installed as an alternative supply, connected via socket and lead to a switchboard with an MEN link installed**

**Figure 4.3 Typical two pole/four pole manual changeover arrangement for a single phase portable generating set with two pole local isolation installed as an alternative supply, connected via socket and lead to a switchboard with an MEN link installed**
2) Control of the generator supply using a generator supply main switch installed on the switchboard to which it is connected (similar to what is done for a solar supply)

3) Over current protection of the generator supply installed on the switchboard to which it is connected (again similar to what is done for a solar supply) As with solar, a circuit breaker installed on the switchboard to which the generator supply it is connected can be used as both the generator supply main switch and the over current protection.

4) For generators connected by socket and lead, ensuring that the neutral pin of the appliance inlet socket cannot become a live conductor whilst the lead to the generator is removed.
Again, that is why this type of connection requires neutral switching in the changeover device.

One thing that you will notice in all of the Figures is the symbol for a suitable building work contractor’s licence and the pre-existing structure) then you must hold a building work contractor’s licence and Business Services (CBS) is reminding the public.

PV ARRAYS - Who can sell or install solar panels

Many home owners are making choices to cut down their energy use and reduce their energy bills. As solar panels have increased in popularity businesses have sought to tap into this growing market. Consumer and Business Services (CBS) is reminding suppliers that if you install solar panel systems, or you sell systems that include installation, you must be licensed. The electrical work must always be performed by a registered electrician.

If the installation includes structural building work (eg modifying/reinforcing roof framing or integrating the solar panel system with a pre-existing structure) then you must hold a building work contractor’s licence and the work must be supervised by a registered building supervisor.

If the installation does not include structural building work you can hold either:

• an electrical contractor’s licence, or
• a suitable building work contractor’s licence - such as a builder’s licence endorsed for ‘PV Solar Panel installation’, or a more general category

of building work as long as the solar panel installation fits within your endorsed category.

In 2016 a company was fined $46,575 after it failed to inform customers of their cooling off rights for unsolicited sales, failed to attend compulsory conciliation conferences with CBS, and contracted for electrical work while unlicensed in South Australia. This serves as a reminder to anyone who installs or sells solar panels including installation to comply with licensing and consumer law requirements.

By law, a business that contracts for the installation must provide warranties to cover:

• quality of materials and workmanship
• compliance with plans, specifications and legal requirements
• completing the work within a specified time or a reasonable time
• meeting the end result that was requested.

Claims against a statutory warranty can be made up to 5 years after the work was completed. However you may be liable for defective building work under the Development Act 1993 for 10 years.

Consumer guarantees under the Australian Consumer Law also apply. If the panels are not of acceptable quality, not fit for purpose, do not match the description given by the supplier, or were not installed with an acceptable level of care and skill and within a reasonable period of time, the consumer is entitled to a remedy (eg refund, repair, or having the panels replaced).

CBS has developed a guide for solar installers which outlines responsibilities in relation to licensing requirements, quotes, contracts, payments and when building indemnity insurance is required. CBS also has a guide for consumers to help them make an informed choice before purchasing a solar panel system.

For more information see the ‘Guide for solar panel installers’ at cbs.sa.gov.au or contact CBS on 131 882.

Look up and live!

A recent incident in SA involving machinery getting in touch with a 19 kV SWER line serves as a reminder to all machinery operators to ‘look up and live’ and be aware of the risks of nearby powerlines!

In this particular incident a fire was started in a field when the machinery contacted the powerline. When the operator tried to grab a fire extinguisher that was attached to the machinery he received a severe shock that caused significant injuries, as the machine was still in contact with the live powerline.

The OTR offers free presentations on safety near overhead and underground powerlines, covering the topics of safe distances and legal requirements when working near powerlines, or how to safely exit a vehicle that is in touch with a high voltage line.

Please contact Reinhard Struve on 08 82265879 or Reinhard.struve@sa.gov.au for further information.
New grid-connected inverter installation standard


The following are some examples of new and revised installation requirements within this standard:

- Standard is applicable to inverter energy systems (IES) up to or equal to 200 kVA – see Clause 1.1.1
- ‘Adjacent’ definition: Within three metres, with each item fully visible from both locations – see Clause 1.3.2
- ‘Multiple mode inverter’ (MMI) definition: Note: Inverters with battery storage ports are considered multiple mode inverters – see Clause 1.3.19
- ‘Restricted access’ definition – see Clause 1.3.29
- Unless specifically stated by the electricity distributor, the rating limit for a single-phase IES in an individual installation shall be equal to 5 kVA, and a multi-phase IES shall have a balanced output with respect to its rating with a tolerance of no greater than 5 kVA unbalance between any phases – see Clause 2.3
- Auxiliary equipment for use with the IES may be connected to the main switch (inverter supply). Where a socket-outlet is used, it shall only be accessed by use of key or a tool and for exclusive use with IES auxiliary equipment – see Clause 3.2.1
- New installation requirements for where a.c. generating sets and IES are installed in the same electrical installation. Note: A generating set cannot absorb energy from an IES – see Clause 3.2.2
- New installation requirements for where connection to the inverter is by a flexible cable and connector or coupling device – see Clause 3.2.3
- Revision of voltage rise requirements; the overall voltage rise from the point of supply to the inverter a.c. terminals (grid-interactive port) shall not exceed 2% of the nominal voltage at the point of supply – see Clause 3.3.3
- New additional central protection requirements for larger three-phase IES ie phase balance protection, under and over voltage protection and under and over frequency protection – see Clause 3.4.4
- A 30 mA RCD dedicated for an IES may be used to meet the mechanical cable protection requirements (ie 50 mm rule) and isolation requirements of AS/NZS 3000 for the cable from the switchboard to the IES. Note: 30 mA RCD protection will not be possible in certain IES arrangements – see Clause 3.4.5
- New ‘demand response mode’ (DRM) installation requirements – see Clause 3.4.6
- New export control of IES requirements; includes hard and soft limits – see Clause 3.4.8
- Revision of connection of inverter to energy source requirements; includes connectors and coupling devices, cabling, cable identification, overcurrent protection and isolation device requirements – see Section 4
- New installation requirements for segregation of circuits – see Clause 5.2
- Revision of installation requirements for multiple mode IES with a separate stand-alone port; this includes final subcircuit, main switch, overcurrent, RCD (for final subcircuit) and changeover device requirements and maintenance of important functions, including MEN connection, the operation of RCDs and the continuity of neutral conductors. Note: RCDs as a method for mechanical protection of the IES grid-interactive port is not permitted for the multiple mode IES grid-interactive port – see Clause 5.4
- New installation requirements for multiple inverter installations (including micro inverters); includes connections to switchboards (with and without loads), main switch, inverter isolation and labelling requirements – see Clause 5.5
- Revised sign and label installation requirements – see Section 6
- New system documentation and commissioning requirements – see Section 7
- Revised example signs – see Appendix A
- Design considerations; voltage rise issues – see Appendix C3

This new standard may be purchased through Standards Australia online.

New proclaimed energy products

The Energy Products Act 2000 in South Australia requires ‘proclaimed’ energy products to have Australian Certification and an approval mark before they can be sold; there is a responsibility that where electrical contractors supply and install such products, they ensure there is valid certification.

From the 29 January 2017, the following energy products will become proclaimed:

- **Air conditioner incorporating flammable refrigerant**
  Certified to AS/NZS 60335.2.40
  This includes household type air conditioners which incorporate motor compressors and are portable, transportable or fixed and use refrigerant having a flammability classification of Class 2 or Class 3 in accordance with ISO 817.

- **Building wiring cable**
  Certified to AS/NZS 5000.1 for working voltages up to 0.6/1 (1.2) kV
  Certified to AS/NZS 5000.2 for working voltages up to 450/750 V
  This includes cables that have 1 to 5 conductors of stranded or solid cores of copper conductors, sheathed or unsheathed insulated cable, with a nominal cross-sectional area per conductor from 0.5 mm² to 16 mm² - but does not include armoured, metallic screened and metal sheathed cables.

- **Double capped light emitting semiconductor lamp**
  Certified to AS/NZS 60598.2.1 Appendix A
  This includes a double capped lamp (eg T5/T8 LED tube), has integral, built-in or independent control gear.

- **Tubular light emitting semiconductor light source**
  This includes a double capped lamp (eg T5/T8 LED tube), has integral, built-in or independent control gear.

- **Revision of connection of inverter to energy source requirements; includes connectors and coupling devices, cabling, cable identification, overcurrent protection and isolation device requirements – see Section 4
- New installation requirements for segregation of circuits – see Clause 5.2
- Revision of installation requirements for multiple mode IES with a separate stand-alone port; this includes final subcircuit, main switch, overcurrent, RCD (for final subcircuits) and changeover device requirements and maintenance of important functions, including MEN connection, the operation of RCDs and the continuity of neutral conductors. Note: RCDs as a method for mechanical protection of the IES grid-interactive port is not permitted for the multiple mode IES grid-interactive port – see Clause 5.4
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- Design considerations; voltage rise issues – see Appendix C3

This new standard may be purchased through Standards Australia online.

Electrical contractors should check that these products have a valid approval mark; if the product is marked with the Regulatory Compliance Mark check the certification details on the ERAC National Certification Database: https://equipment.erac.gov.au/Public/

If there are any further doubts regarding the certification, ask the supplier/manufacturer to provide proof of certification, eg copy of Australian Certificate of Approval/Conformity. Check that the certificate details align with all the product markings and specifications.

Ensure to always purchase electrical products from reputable Australian businesses to minimise any potential liability.

For further information regarding proclaimed energy products, search ‘Product approvals’ in the following web link: www.sa.gov.au
## Electric Shock Report Incidents

<table>
<thead>
<tr>
<th>Junction Source</th>
<th>Cause</th>
<th>Contributing Factors</th>
<th>Injuries</th>
<th>Action to make safe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junction box located in roof space.</td>
<td>Junction box designed with push-on lid. The heat in the roof space often deforms the lid making it easy for the lid to fall off.</td>
<td>Early model of junction box had lid knocked off by worker’s hand brushing against it as he reached into roof space, exposing live connections.</td>
<td>Electrical worker received electric shock to hand.</td>
<td>Electrical worker permanently secured lid in place.</td>
</tr>
<tr>
<td>Socket outlet in office area.</td>
<td>Water had run into socket outlet.</td>
<td>Water leaked from removed roof in this section of the building into wall and then finally to the socket outlet.</td>
<td>Nurse received electric shock to hand when operating socket outlet.</td>
<td>Electrical contractor isolated electrical supply to affected circuits.</td>
</tr>
<tr>
<td>Revenue metering time clock for off-peak hot water service.</td>
<td>Home owner contacted live switching mechanism inside time clock.</td>
<td>Home owner removed cover of time clock and attempted to adjust the time at which the unit turned on and off.</td>
<td>Home owner received electric shock between hands.</td>
<td>Owner warned about interfering with sealed revenue metering equipment. Time clock replaced by Network Operator.</td>
</tr>
<tr>
<td>Taps in shower.</td>
<td>Electric fence energiser.</td>
<td>Electric fence in contact with house’s water pipes resulting in shocks received when using shower.</td>
<td>Home owner received electric shock between hands and feet.</td>
<td>Electrical contractor isolated fence energiser.</td>
</tr>
<tr>
<td>Taps in main bathroom.</td>
<td>Faulty underground cable.</td>
<td>Damaged underground consumer mains cable resulted in shocks being felt when contacting taps.</td>
<td>Home owner received electric shock to hands.</td>
<td>Network Operator disconnected cable at service pit. Owner to arrange repair with electrical contractor.</td>
</tr>
<tr>
<td>Unterminated cable.</td>
<td>Isolator not locked off.</td>
<td>Refrigeration worker brushed against cable end when installing split type air conditioner.</td>
<td>Worker received electric shock to left leg.</td>
<td>Electrical contractor locked off isolators and terminated cable involved.</td>
</tr>
<tr>
<td>Downlight transformer.</td>
<td>Rodent had chewed through flexible cord of transformer.</td>
<td>Worker in hotel was replacing plug-in type transformer when he contacted exposed live parts.</td>
<td>Worker received electric shock to hands.</td>
<td>Electrical contractor isolated circuit and replaced transformer. Hotel to increase vermin control.</td>
</tr>
<tr>
<td>Switchboard with dual supplies.</td>
<td>Electrical worker assumed all electrical supplies isolated.</td>
<td>Scheduled work was changed and now required access to the dual supply area of the switchboard.</td>
<td>Electrical worker received electric shock to right hand.</td>
<td>Electrical contractor to review workplace procedures.</td>
</tr>
<tr>
<td>Water pipe on external wall of house.</td>
<td>High resistance neutral conductor in service pit.</td>
<td>Home owner made contact with water pipes and ground outside of his house.</td>
<td>Home owner received electric shock between hand and foot.</td>
<td>Network operator repaired damage to service pillar caused by white ant infestation.</td>
</tr>
<tr>
<td>Damaged cable.</td>
<td>Birds had partially stripped insulation on active and neutral conductors.</td>
<td>Plumber brushed against exposed wires when attempting to seal out birds from roof space.</td>
<td>Plumbing worker received electric shock to hand.</td>
<td>Electrical contractor replaced damaged cable. Measures taken to control vermin.</td>
</tr>
<tr>
<td>Socket outlet adjacent weighing scales.</td>
<td>Build-up of salt type powder on outlet.</td>
<td>Technician used scales to repeatedly weigh out worms and in the process contaminated nearby socket outlet.</td>
<td>Laboratory technician received electric shock between hands.</td>
<td>Workplace procedures reviewed so no substances were spilt on the socket outlet. Electrical contractor replaced socket outlet.</td>
</tr>
<tr>
<td>Portable hair dryer.</td>
<td>Flexible cord damaged.</td>
<td>Worker at care centre was using the hair dryer to dry paintings for clients when she contacted the damaged cord.</td>
<td>Worker received electric shock to hand.</td>
<td>Hair dryer removed from service. Workplace policies reviewed.</td>
</tr>
<tr>
<td>Network operator’s service fuse.</td>
<td>Home owner reinserted service fuse themselves.</td>
<td>Possibly due to act of vandalism owner reinserted service fuse and accidentally contacted the live parts of the fuse base.</td>
<td>Home owner received electric shock between hands.</td>
<td>Network operator attended, checked and resealed service fuse. Owner was advised not to attempt this again but to phone them if any other issues arise.</td>
</tr>
<tr>
<td>Street lighting column.</td>
<td>Fault in light fitting had caused a voltage to be present on the column supporting it.</td>
<td>Person walking dog went to grab dog that was in some distress from contacting light column and in doing so received shock themselves.</td>
<td>Electric shock to pet and also to owner’s hand.</td>
<td>Network operator disconnected light fitting until replacement could be arranged.</td>
</tr>
<tr>
<td>Washing machine.</td>
<td>Internal water path component had failed.</td>
<td>Home owner went to move machine to find water leak. The internal water leak had sprayed mist over electrical connections permitting voltage to track to rear case.</td>
<td>Home owner received shock between hands and feet.</td>
<td>Service technician inspected washing machine and arranged for replacement of unit.</td>
</tr>
<tr>
<td>Steel wall framing of kitchen.</td>
<td>Power cable in brick plaster wall.</td>
<td>Builders had penetrated cable plastered in wall when fixing new steel frame kitchen bulkhead. Existing house is solid brick build.</td>
<td>Electrical worker received electric shock to hands when accessing bulkhead.</td>
<td>Electrical contractor disconnected damaged cable and rerouted it.</td>
</tr>
<tr>
<td>Kitchen toaster appliance.</td>
<td>Damaged CJ split steel conduit cable system supplying kitchen socket outlet.</td>
<td>Conduit split apart in roof space livening itself and earth at toaster socket outlet. Victim received shock when attempting to remove toast.</td>
<td>In-home care worker received electric shock and burnt hand.</td>
<td>Electrical contractor disconnected entire installation and rewired those parts that required it.</td>
</tr>
</tbody>
</table>
**Gas Bulletin**

**Extract AS/NZS5601.1:2013**

Clause 4.4 PROHIBITED TYPES OF JOINTS AND FITTINGS

The following fittings or jointing systems shall not be used in consumer piping:

(a) Croxed joints.

(b) Compression fittings with non-metallic olives excluding plastics fittings suitable for gas and complying with AS/NZS 4129.

(c) Compression fittings with metallic olives if not approved for use with gas in the manufacturer’s instructions.

(d) Longscrew connectors.

(e) Internally threaded PVC-U fittings unless manufactured with a reinforcing metal band.

(f) Capillary fittings containing soft-solder.

(g) Plain nipples, eg running nipple with parallel threads, except where no practical alternative is available.

**Note:** A brass external parallel thread to a brass internal parallel thread may be used, provided that the joint is silver brazed (not welded), or a suitable permanent (hard-setting) thread compound is used to chemically weld the fittings, and a means of disconnection is provided immediately downstream of that joint.

Wherever possible the fitting should be secured against disturbance.

**Expiation fees apply!**

Despite many years of providing information and warnings to gas contractors and workers about the correct installation of hose assemblies and anti-tilt devices for free standing cooking appliances, contractors are still not applying the correct method.

The OTR will expiate these non-compliances. The minimum fee is $375.00, plus there is the embarrassment of going back to install it correctly as well. You have no excuses. Gas Bulletin No. 3, explaining the correct procedure and requirements for hose assemblies, has been included in this edition and is also available on the website or by contacting the OTR. The anti-tilt device installation directions are supplied with the appliance. If they are not, then contact the manufacturer for a copy.

**APA Emergency Over Pressure (EOP) Facts**

Figures provided by APA (AGN) will assist you in designing consumer services that may require over pressure protection (OPP) for pipework, components or appliances that are not rated for exposure to the network/installation EOP. For example, you may require two stage regulation or an ‘OPSO’ value to protect an appliance or equipment from the network/installation EOP that arises if the meter or network regulator fails. For EOP details, call APA 1300 001 001.

Knowing the EOP is critical to your design as it impacts on the selection of components and pressure testing. The Standard requires a soundness test at 7 kPa or 1.5 times the outlet pressure, whichever is the greater for services at 3 kPa or less. The OTR recommends the pressure test be conducted at the EOP for gas installations operating above 3 kPa.

**Note:** The OTR has specific requirements when applying for a metering pressure above 3 kPa or when increasing the existing pressure to above 3 kPa. Bulletins listing these requirements are available - contact the OTR.

**Uncertified Type B appliances**

Contractors and gasfitters who connect gas or commission Type B appliances without following up to have them Type B certified, and leaving uncertified equipment for the client to operate, will be expiated.

This is a clear breach of the Gas Act. Offenders may be subject to recovery action from the client’s insurance if an incident occurs and it can be proven that they did not advise the owner/operator, in writing, not to operate the equipment. The operation of uncertified Type B equipment can place the business and the public at risk as the equipment has not been independently verified as safe/compliant.

If you are required to pipe gas to a Type B appliance or installation, do not connect it unless you are appropriately licensed, trained and have received a commissioning gas letter from an authorised Type B certifier.

To receive a commissioning gas letter, a submission must be provided to a certifier prior to installation of a Type B appliance. Failure to observe this direction may also result in the gas supply to the premises being turned off.

If the commissioning and Type B submissions are not part of your work then you must turn off the gas isolation valve to the appliance once connected, tag the appliance as “Do Not Operate Until Certified” and note it on the gas installation CoC.

It is advisable to take a photo of the appliance isolation valve with the “Do Not Operate...” tag to cover yourself.

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**Adding an extension to your home?**

The OTR recently received a referral from the network operator regarding a property owner/developer who wanted gas reconnected to an investment property which was undergoing renovations. The developer was converting a garage into a fifth bedroom and wanted the gas on urgently to enable hot water for clean-up and advertising.

In this case gas was refused until the developer had the meters relocated and a gas certificate of compliance was completed to verify that the installations were compliant.

If home extension/renovation plans affect the accessibility to gas and electrical meters the owner will need to contact their energy retailer to organise the relocation of the meters, and avoid the above situation.
Flueing of commercial baking ovens

Recent inspection/testing of some imported commercial baking ovens revealed that they have been flued using certified domestic twin skin flues of 0.6 mm wall thickness. Certified twin skin flues have a maximum temperature limit of 300ºC. The flue temperatures in the ovens tested, measured in excess of 540ºC, hence the installation did not comply.

Flue materials for higher temperature applications need to be sleeved (ie an inner and outer flue). For example, a mild steel inner flue of 1.6 mm thick at 150 mm diameter, and an outer sleeve of 200 mm, allows a 25 mm gap between the flues. The clearance to combustible materials from the outer sleeve is a minimum of 25 mm.

For electrical or communications wiring, and plastic water pipes, the minimum clearance is 75 mm for appliances with a draught diverter or 150 mm where the flue or appliance has no draught diverter.

Contact the OTR for further information.

Large meter isolating valves

With the advent of high performance gas appliances, often installed in multiples in larger upmarket homes, it is not uncommon to see commercial metering sets where the demand justifies this.

The meter sets (billing meter, regulator, filter etc) are larger than conventional domestic meters resulting in freestanding installations and you may find that the handles for the gas isolating valve are not always provided.

The pictures below show ‘Audco’ plug valves with a square shaft that requires a large spanner or wrench to operate.

Note: it is very important to pressurise the system first by turning the valve on slowly. If the valve is seized, call APA first response on 1800 427 532.
Use of long threads (running nipples)

Audits and enquiries have shown that there are gasfitters still using parallel threads inappropriately. The most common practice is the use of a female fitting within a wall cavity and extending out through the wall with a parallel running nipple (long thread). This practice must be avoided unless there is no practical alternative available. Some manufacturers of composite pipe do provide tapered fittings that allow correct jointing. The other common alternative is to use brass tapered thread or short galvanised pipe pieces/fittings.

The main issue for OTR inspectors and APA contractors is to identify whether the fitting has been silver brazed or chemically welded with a permanent (hard-setting) thread compound, when the fitting is behind the wall.

Second fit installers and APA contractors may not complete installations of appliances or the connection of the gas meter due to this situation.

Quiz – test your knowledge (answers on page 11)

1) What type of pressure test point is used to measure pressures above 7 kPa?
2) Can you use a hose assembly to connect an under cooker connection on a freestanding cooker?
3) What horizontal distance is required from an external water heater flue to a PVC vent pipe?
4) Are you allowed to convert any Type A gas appliance from NG to LPG?
5) How many litres of LP gas in a kilogram of propane liquid?
6) One kilowatt of natural gas equals how many megajoules/hour?
7) Why are LPG tanks painted white, not silver?
   Is it:
   a) so I can see it at night under a silvery moon
   b) white is the most effective colour to keep tanks cool in our hot climate
   c) silver paint is costly and requires recoating more often
   d) white is a good background colour for LPG supplier labels/stickers.
8) What colour is a gas type label for propane on an appliance - orange, red or blue?
9) Can a sub-meter be installed on the ground?
10) When testing for leaks can oxygen be used as a substitute for air or the applicable fuel gas?
11) If I install/commission/repair a Type B appliance can I leave it operating without Type B certification?
12) Can I withhold a gas certificate of compliance on grounds of non-payment by my client (ie commercial dispute)?
13) What is the maximum temperature that a PVC-U flue pipe can be subjected to?
14) A Universal LP (ULP) appliance can use what gases?
15) Can I use Polyethylene (PE) pipe under a building or above ground?
16) What is the maximum pressure for screwed cast iron fittings on galvanised steel pipe?
17) Can I install a cooker using a flexible hose if the manufacturer’s instructions do not make any reference to them?
18) Do I need to perform a spillage test if I install a space heater/wall furnace, or other internal open flued appliance within a building?
19) What is the maximum permissible rate for a flueless heater for natural gas in South Australia?
   a) 6 MJ/h
   b) 12 MJ/h
   c) 18 MJ/h
   d) 25 MJ/h
20) Can space heaters be installed in bedrooms?
21) Can I issue a gas certificate of compliance on behalf of an unlicensed mate or acquaintance?
22) Is 5 minutes sufficient for all pressure tests for soundness?
23) What is the current Gas Standard for general installations?
Certificate of compliance and internal sanitary drain as-constructed drawings must be submitted to the OTR within seven days of completing the work.

**Plumbing contractor's obligations for booking audits**

It has become apparent to the OTR that there may be some confusion around the requirements/obligations of contractors and plumbers when it comes to audits conducted for plumbing and drainage installations.

The SMS notification system which is currently in place is under review and the OTR will be seeking to consult further with industry to determine whether there may be more effective ways of managing this process. Technology has influenced the way we communicate and the OTR believes it is time to revisit the current arrangements.

The OTR would appreciate any plumbers/contractors who would like to make themselves available to participate and have input into the review of the existing procedures. If you wish to participate please contact Todd Lewis on: 0409 590 020 or email: todd.lewis@sa.gov.au

Current policy for booking plumbing audits:

- Plumbers can make bookings online at www.plumbingbook.sa.gov.au or alternatively by calling 1300 884 055.
- For information regarding plumbing related matters, including booking audits, please visit www.sa.gov.au/otrplumbing and click on the Plumbing and drainage inspection tab.
- When booking the audit, the plumbing contractor must nominate the date and time for the audit.
- For bookings classified as drainage the OTR will send an SMS confirming the OTR will be attending at the time nominated by the plumbing contractor.
- For drainage bookings regardless of whether an SMS has been received, the OTR may still attend the site to audit the plumbing installation.
- For bookings classified as underfloor plumbing or above ground sanitary plumbing etc. the OTR will not send an SMS.
- For all drainage and underfloor audits the work must be under test and the plumber on site must not backfill the work until 20 minutes after the plumbing contractor's nominated booking time.

**Quiz answers**

1) Self-sealing (Pete’s Plug).
2) No - refer to clause 6.10.1.10.
3) 75 mm for fan assisted and 150 mm for natural draught.
4) No – unless it is marked on the data plate as suitable for the alternative gas.
5) 536 litres (approximately).
6) 3.6 MJ/h.
7) (b) white is the most effective colour to keep tanks cool in our hot climate.
8) Orange.
9) No - refer to clause 5.11.6.2 (k).
10) No - Oxygen must not be used - refer to Clause 3.6.
11) No - Type B appliances must be certified by an OTR authorised certifier before commercial operation.
12) No - You must issue a gas certificate of compliance within 30 days of completing the work.
13) 60°C – refer to Clause 4.7.5, table 2.
14) Propane or butane.
15) No - refer to Clause 5.4.1 (PE is referred to as plastic piping).
16) 7 kPa – refer table 4.1.
17) Yes - normally manufacturers will prohibit the use of a flexible connection if they are not suitable. If unsure contact the manufacturer.
18) Yes - refer to clause 6.11.4 (commissioning appliances).
19) (c) 18 MJ/h.
20) Yes - providing it is flued, has a flame safeguard and permanent ventilation.
21) Only if you want to accept the legal responsibility for work performed by others, potentially unskilled installers. We suggest that you inspect/test the work thoroughly and note what you have done on the gas CoC, ie “Inspected accessible work and pressure tested installation performed by others”.
22) No - The test duration is 5 minutes for up to 30 litres plus 5 minutes for each 30 litres or part thereof. If we had an 80 litre service we need 80 ÷ 30 = 2.67, therefore purge time is 3 x 5 = 15 minutes.
23) The current Standard is the 2013 edition with Amendments 1 and 2 (AS/NZS 5601.1 inc. 1 & 2).
Contact list

Electrical Technical Advice
Office of the Technical Regulator
Level 8, 11 Waymouth Street, Adelaide
Phone: (08) 8226 5518 (8:30am–4:30pm)
Fax: (08) 8226 5529
Email: dsd.otrmail@sa.gov.au

Electrical Certificates of Compliance
Available in person from the following agencies:
Office of the Technical Regulator
Level 8, 11 Waymouth Street, Adelaide
NECA
213 Greenhill Road, Eastwood
Phone: (08) 8272 2966
Lawrence & Hanson
All stores
MM Electrical
All stores
Middendorp
All Stores
Rexel Australia Ltd
All stores
P & R Electrical Wholesalers
All stores
CNW Wholesalers
All stores
Service SA Outlets
EDS Centre, 108 North Terrace, Adelaide and Regional Areas

Gas Technical Advice
Office of the Technical Regulator
Level 8, 11 Waymouth Street, Adelaide.
Phone: (08) 8226 5722 (8:00am–5:00pm)
Fax: (08) 8226 5866
Email: dsd.otr@sa.gov.au

Gas Certificates of Compliance
Personal collection available from:
SA Water
250 Victoria Square, Adelaide
Gas Works
All stores
Norm’s Plumbing Supplies
John Street, Mt Gambier
Samios Plumbing Supplies
All stores
Scott’s Plumbing
66 O.G. Road, Klemzig
Northern’s Plumbing Supplies
All Stores
TradeLink
All stores
Reece Plumbing
All stores

Additional websites for further information
South Australian Parliament for Acts and Regulations
www.legislation.sa.gov.au
SafeWork SA
www.safework.sa.gov.au
Australian Liquefied Petroleum Gas Association (ALPGA)
www.alpga.asn.au
Australian Competition and Consumer Commission (ACCC)
www.accc.gov.au
Australian Gas Networks Ltd (formerly Envestra)
www.australiangasnetworks.com.au
Elgas
www.elgas.com.au
Origin Energy
www.originenergy.com.au
Kleenheat
www.kleenheat.com.au
Australian Standards
www.infostore.saiglobal.com/store/

For Locations of Gas, Electricity or Telecommunications
“Dial Before You Dig”
This service is still available when doing emergency excavations at short notice.
Phone: 1100
www.dialbeforeyoudig.com.au

For after hours locations or gas emergency (including LPG)
Natural Gas Network: 1800 808 526
Origin Energy LPG: 1800 808 526
Kleenheat: 1800 093 336
Elgas: 1800 819 783
APA Group Gas leaks: 1800 427 532
(1800 GAS LEAK)

For gas or electrical major incident reporting 24/7 (SA only)
Office of the Technical Regulator
Phone: 1800 558 811
This number also appears in the 24 hour emergency numbers section at the front of the South Australian White Pages

Service SA Outlets
EDS Centre, 108 North Terrace, Adelaide and Regional Areas

General Information
Licence and Address Change
Consumer & Business Services
Phone: 131 882
Email: occupational@sa.gov.au
Appointments and Information
SA Power Networks Builders & Contractors Line
Phone: 1300 6500 14
Fax: 1300 6500 16

Australian Standards
Standards Australia
www.standards.com.au
AGA
Phone: (03) 9590 4500
www.gas.asn.au

Training
Gas
Master Plumbers Association (formerly PIA)
1 South Road, Thebarton
Phone: (08) 8292 4000
Fax: (08) 8292 4040
Technical Advisory Centre P/L
4/543 Churchill Road, Kilburn
Phone: (08) 8162 5640
Fax: (08) 8162 5638
www.techad.com.au

Gastrain
U1 61-65 Tapleys Hill Road
Hendon 5014
(PO Box 83, Royal Park 5014)
Phone: (08) 8447 7783
Phone: (08) 8447 7753
www.gastrain.com.au

Electrical and Gas
TAFE info (for all training enquiries)
Phone: 1800 882 661
Peer Veet
Rescue and Resuscitation, First Aid & other Industry related courses:
1042 Port Road, Albert Park
Phone: (08) 8348 1200
www.peer.com.au

For Locations of Gas, Electricity or Telecommunications
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Gas Trade contact
APA Group system operator
Phone: 1300 001 001

Government of South Australia
Department of State Development