

energy

Bulletin

ISSN 1323-8957

• In this issue...

- EnergySafety issues two Orders after Morley Galleria Shopping Centre explosion 1
- Separation of common services – above and below ground 2

Electrical Focus 6

- Electrical contractor's \$68,000 oversight 6
- Review of the Electricity (Licensing) Regulations 1991 6
- Incomplete Notices will be returned to sender 6
- Inadequate checking and testing for overhead to underground changeovers 7
- Q & A's – Notices 8
- Electrical fitter fined for carrying out electrical installing work 9
- Standards update 10
- Your apprentice is *your* responsibility 11
- Powers of licence inspectors 12
- Work on transportable structures and vehicles 12
- Electricity safety statistics 13
- New Code of Practice for Electrical Inspectors published 14
- Operation and maintenance of oil-filled HV combined-fuse switches 14
- Prosecutions for breaches of electricity legislation 15
- Summary of Infringements for breaches of electricity legislation 15

Gas Focus 16

- New edition of AS 3814 published 16
- Multistorey residential compliance project 16
- Safety precautions when carrying out hot works in the vicinity of gas infrastructure 18
- Prosecutions for breaches of gas legislation 19
- Summary of infringements for breaches of gas legislation 20

EnergySafety issues two Orders after Morley Galleria Shopping Centre explosion

EnergySafety issued two Orders to owners and operators of high voltage (HV) installations with oil-insulated HV combined-fuse switches following the fatal explosion at the Morley Galleria Shopping Centre on 3 February 2015.

Two electricians were killed when the 11kV oil-insulated Long & Crawford combined-fuse switch they were maintaining exploded when a high current fault occurred in the tank of the unit.

The first Order dated 13 February 2015 under Section 18B of the *Energy Coordination Act 1994*, was issued based on evidence obtained during the investigation. This Order stipulates that:

- No person shall open the lid of any Long & Crawford (L & C) fuse switches until the unit to be worked upon is completely isolated from the electricity supply.
- Owners and operators of L & C fuse switches shall not permit any person to open the lid of any L & C fuse switches until the unit to be worked upon is completely isolated from the electricity supply.
- L & C fuse switches worked upon must remain isolated until all work is completed and the tank lid closed.

On Tuesday 24 March 2015, EnergySafety issued a second Order (02-2015). While the first Order pertained to only Long & Crawford Manchester switchgear, (later GEC Alstom), the second order applies to all HV oil-insulated combined-fuse switches.

In addition to banning the opening of the lid, the new Order also prohibits the commencement of any electrical work

on this type of equipment, including operation of the switching or earthing mechanisms in cases where an HV fuse has operated.

The new Order No 02-2015 requires that:

- No person may commence any electrical work on any HV oil-insulated combined-fuse switch, including operation of the switching or earthing mechanisms or opening the lid, until it is first completely isolated from the electricity supply.
- Owners and operators of oil-insulated HV combined-fuse switches must not permit any person to commence any electrical work on any such switches under their ownership or control, including operation of the switching or earthing mechanism or opening the lid, until the switch to be worked upon is completely isolated from all sources of electricity.
- Switches worked upon must remain isolated and electrically dead until all work is completed and the tank lid closed.
- The HV switches affected by this Order include all oil-insulated models designed to permit fuse changes while parts at the bottom of the tank remain energised.

Both Orders can be downloaded from EnergySafety's website.



KEN BOWRON

DIRECTOR OF ENERGY SAFETY

EnergySafety



Government of Western Australia
Department of Commerce

EnergySafety
303 Sevenoaks Street
Cannington
Western Australia 6107

Telephone: (08) 6251 1900
Fax: (08) 6251 1901
Email: energysafety@commerce.wa.gov.au
Internet: www.energysafety.wa.gov.au

Separation of common services – above and below ground

Building practitioners are responsible for ensuring minimum separation distances are maintained when installing multiple services such as water, gas and electrical services in close proximity to each other.

Services not installed correctly in close proximity to each other increase the risk of property damage arising from failures. This may result in death or injury of a person attempting to access or repair a faulty service.

Background

The Building Commission has noted that where multiple services are installed in the same trench, duct, wall chase or roof space, the required separation distances (both horizontally and vertically) are not being met. The minimum separation requirements for the various services are set out in different Australian Standards.

Requirements for the separation of distributed gas and water systems from low voltage wiring systems are provided in the AS/NZS 5601 series for gas services and AS/NZS 3500 series for water services. AS/NZS 3000 Electrical installations provide minimum distances between electrical services and other services, including telecommunication cables.

Requirements for the separation of telecommunications cables from low voltage and high voltage systems appear in AS/CA S009.

In order to avoid potential risks associated with installing multiple services in close proximity to each other, builders should check with their sub-contractors that installers are aware of the specific requirements about proximity of services and ensure completed installations have prescribed minimum separation distances.

Separation distances

Separation distances provided in this article are considered to be the ones most prevalent in non-compliance observed by Building Commission Inspectors. The separation distances quoted have been sourced from current Australian Standards.

The following is a summary of some of the important separation requirements set out in these Standards. It is an indicative summary only and should not be used as a substitute for referring directly to the applicable Australian Standards.

Proximity of services – below ground

Any service trench that contains more than one individual service is generally referred to as a shared or common trench.

Common trenches are a practical solution for the conveyance of multiple services and appear to be more commonly used within multi-unit developments.

1. The separation between any underground drain or water service pipe with an electrical supply cable shall be at least –
 - a. 100mm for water service pipe not greater than DN65, provided the electrical supply cable is indicated along its length with orange marker tape complying with AS/NZS 2648.1 and is mechanically protected; or
 - b. 300mm, where the water service pipe is greater than DN65 and the electrical supply cable is indicated along its length with marker tape complying with the requirements of AS/NZS 2648.1 and is mechanically protected; or
 - c. 600mm where the electrical supply cable is neither indicated nor protected.
2. All underground wiring systems suitably marked with warning tape shall be spaced not less than 100 mm from other underground services.
3. The separation between any underground drain or water service pipe with an electrical earthing electrode, for an electrical supply not exceeding 1000V, shall be at least 500mm.

Continued over page

© Department of Commerce 2015
ISSN 1323-8957

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

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

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

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

For enquiries:

Editor: Candace Beilby
Phone: 08 6251 1930
Fax: 08 6251 1901
Email: candace.beilby@commerce.wa.gov.au
Internet: www.energysafety.wa.gov.au

Continued from previous page

For an electrical supply exceeding 1000V, the relevant authority shall be contacted for a ruling.

4. The separation between any underground drain or water service pipe and consumer gas pipes shall be at least –
 - a. 100mm provided the consumer gas pipe is indicated along its length with marker tape complying with the requirements of AS/NZS 2648.1 laid 150mm above the installed pipe and is mechanically protected; or
 - b. 300mm, where the water service is greater than DN65 and the consumer gas pipe is indicated along its length with marker tape complying

- with the requirements of AS/NZS 2648.1 laid 150mm above the installed pipe and is mechanically protected; or
- c. 600mm where the consumer gas pipe is neither indicated nor mechanically protected.
5. The separation between any underground consumer gas pipe and a low voltage electrical service indicated along its length with marker tape complying with the requirements of AS/NZS 2648.1 and is mechanically protected shall be at least 100mm.
6. The separation between any underground drain and a water service shall be at least 100mm horizontally and the underside of the water pipe is at least 100mm above the top of the drain.

7. The separation between any underground drain or water service pipe (both cold and heated) and a communication cable shall be at least 100mm.
8. The separation of any underground drain and a stormwater drain not exceeding DN100 shall be at least 100mm and at least 300mm from a stormwater drain exceeding DN100.
9. The separation of a non-drinking water service pipe and any parallel drinking water service pipe shall be at least 300mm.

Note: Mechanical protection is provided by any of the following: concrete slabs, continuous pour, bricks designed for protecting electrical supply cables.

Continued over page

Note: Whilst reasonable care is taken in relation to the creation of the table below, the Building Commission does not guarantee or warrant the accuracy, reliability, completeness or currency of the information contained in this table. Further, changes in circumstances after the publication of this material or information may impact upon its accuracy, and users of this table are responsible for assessing its relevance and verifying the accuracy of the content. Before acting on any advice contained within this table you should refer to the relevant utilities authority and Australian Standards to confirm the details are correct.

BELOW GROUND SERVICES (GENERAL ADVICE ONLY)		Water Service (Drinking water supply)			Under- ground sanitary drain	Storm- water drain not greater than DN100	Storm- water drain greater than DN100	Electrical supply cable	Consumer gas pipe	Communi- cation cable
		Cold Water		Heated water						
		Not greater than DN65	Greater than DN65							
Non drinking water		300	300	300	100	100	300	100 for ≤ DN65 or 300 > DN65	100 for ≤ DN65 or 300 > DN65	100
Consumer gas pipe	Indicated with orange marker tape laid 150mm above the installed pipe to AS/ NZS2648.1 and mechanically protected	100	300	100	100	100	100	100	N/A	100
	Neither indicated nor mechanically protected	600	600	300	600	600	600	300	N/A	100
Electrical supply cable	Indicated with orange marker tape to AS/ NZS2648.1 and mechanically protected	100	300	100	100	100	100	N/A	100	100
	Neither indicated nor mechanically protected	600	600	300	600	600	600	N/A	300	300
Underground sanitary drain		100	100	100	100	100	300	N/A	N/A	100
Electrical earthing rod for an electrical supply not exceeding 1000V		500	500	500	500	600	600	N/A	500	N/A
Communication cable		100	100	100	100	100	100	N/A	N/A	N/A

Table 1 showing an indicative summary of separation distances in mm between different below ground services.

Continued from previous page

Proximity of services – above ground

Service ducts, wall chases and roof spaces

Building Commission Inspectors have noted that water, electrical and gas services are sometimes run in the same wall chase and/or in the same conduit installed under a floor slab. Where the same duct or chase is used for different services the minimum required separation distance has to be maintained.

1. A separation distance of at least 25 mm shall be maintained between any above ground cold water service and an electrical conduit, electrical wire or cable and consumer gas pipes.
2. A separation distance of at least 100 mm shall be maintained between any above ground pipework associated with heated water service and electrical cables, gas pipes, or other services.
3. A separation distance of at least 100 mm shall be maintained between any above ground drain or discharge pipes and an electrical conduit, electrical wire or cable, consumer gas pipes, or water services.

4. A separation distance of at least 100 mm shall be maintained between any above ground site stormwater downpipe and an electrical conduit, electrical wire or cable, consumer gas pipes, or water services.

Crossover of other services

Separation distances need to be maintained where services cross over each other in all situations. Non-compliance in this area is prevalent in roof spaces where services are run in all directions and in many cases lay upon each other. (See example in photograph 1 opposite)

Non-complying separation of services.

Instances where electrical cables, water and gas pipes overlay each other and separation is not maintained (as depicted in the photographs on page 5) will be considered non-compliant.

Service identification

The contents of pipes, conduits, ducts and sheathing used to contain fluids, or for the distribution of electrical or communications services must be identified by the use of colours, words and symbols, in accordance with

AS 1345: Identification of the contents of pipes, conduits and ducts.

Further information

Where builders or licensed trades have any questions about the separation of plumbing and drainage services in common service trenches or above ground in floors, walls or roof spaces where they are in close proximity to other services, they should call the Plumbers technical advice line on 1300 360 897, or email at plumbers@commerce.wa.gov.au

Where builders or licensed trades have any questions about the separation of electrical or gas services in common service trenches or above ground in floors, walls or roof spaces, where they are in close proximity to other services, they should contact EnergySafety on 6251 1900, or email at energysafety@commerce.wa.gov.au

Note: Whilst reasonable care is taken in relation to the creation of the table below, the Building Commission does not guarantee or warrant the accuracy, reliability, completeness or currency of the information contained in this table. Further, changes in circumstances after the publication of this material or information may impact upon its accuracy, and users of this table are responsible for assessing its relevance and verifying the accuracy of the content. Before acting on any advice contained within this table you should refer to the relevant utilities authority and Australian Standards to confirm the details are correct.

ABOVE GROUND SERVICES (GENERAL ADVICE ONLY)	Water Service (Drinking water supply)			Stormwater pipes (Downpipes)	LV Electrical supply cable	Consumer gas pipe	Commun- ication cable
	Cold water		Heated water				
	Not greater than DN65	Greater than DN65					
Non drinking water (not installed in pipe duct or structurally separated)	100	100	100	100	25	25	50
Consumer gas pipe	25	25	100	100	25	N/A	150
Electrical supply cable	25	25	100	100	N/A	25	50
Sanitary drain (drainage pipe)	100	100	100	N/A	100	100	100
Communication cable	50	50	150	100	50	150	N/A

NOTES:

LV Voltage exceeding 50 V a.c. but not exceeding 1000 V a.c.

Table 2 showing an indicative summary of separation distances in mm between different above ground services.

Continued from previous page



Photo 1: Minimum of 25mm separation required between cold water services, gas pipes and electrical cables. 100mm minimum separation required between heated water services, gas pipes and electrical cables.



Photo 2: Minimum 100mm separation required between the heated water service (middle grey pipe) and gas (yellow pipe). Minimum separation of 100mm is required between heated water service pipe and electrical cables. Minimum 25mm separation between the electrical cable and the gas service pipes.



Photo 3: Minimum 600mm separation required between water services (grey pipe) and gas (yellow pipe), because there is no indicator tape or mechanical protection to the gas service.



Photo 4: Minimum 100mm separation required between water services and electrical cable.

electrical

focus

Electrical contractor's \$68,000 oversight

An electrical contractor has pleaded guilty, in the Narrogin Magistrate's Court, to submitting a Notice of Completion to Western Power for electrical installing work which had not been completed and was unsafe and substandard.

The electrical contractor was engaged to install and connect a three-phase consumer mains cable from the mains connection box (MCB) to a relocated remote meter enclosure, reposition the main switchboard and connect final sub-circuits and their associated protection devices and fit socket outlets, lighting fittings, a three-phase socket outlet and an air-conditioning unit at a domestic property.

The electrician responsible for carrying out the electrical work failed to earth the relocated remote meter enclosure. This defect was detected by a Western Power inspector undertaking a routine Notice inspection of the installation.

AS/NZS 3000: 2007 – Wiring Rules requires all exposed conductive parts of an installation to be earthed.

The electricity supply had been connected to the installation at the time of the inspection, which meant the installation was left in a dangerous condition.

Investigation by Western Power found the electrician did not have a procedure for checking and testing the installation or any checking and testing sheet to follow.

This was also the first occasion where he had carried out this type of work.

In her sentencing remarks, the Magistrate noted the penalty reflected the following factors:

- a Notice of Completion is analogous to a guarantee by the company that the work is safe;
- the work was accessible to the public including children; and
- the danger of electrocution and fatality.

Due to the seriousness of the offence, the electrical contractor was convicted and fined \$68,000 with court costs of \$625.

Review of the Electricity (Licensing) Regulations 1991

The public consultation on the proposed amendments to the Electricity (Licensing) Regulations 1991 has now closed after industry members and other interested parties were invited to submit their comments to EnergySafety.

The proposed amendments to the Electricity (Licensing) Regulations 1991 include:

- Regulation 3 and 4A – definitions.
- Regulation 19 – electrical installing work.
- Regulations 26 and 27 – the licensing of electrical workers.
- Regulation 33 – the licensing of electrical contractors.

- Regulation 37 – instances where in-house electrical installing work is permitted.
- Regulation 38 – the duties of nominees.
- Regulation 44 – the renewal of electrical licenses.
- Regulation 50 – supervision of electrical work.
- Regulation 52 – Notices of Completion.
- Regulation 64 – licensing renewal fees.
- Schedule 2 – Australian/ New Zealand standards for electrical work.

EnergySafety is reviewing the amendments expected to be finalised and gazetted by late 2015.

Incomplete Notices will be returned to sender

Electrical contractors and their electricians are reminded that they must ensure that the address details are complete including the postcode for all Notices submitted to EnergySafety. Incomplete Notices will be promptly returned to sender.

It is a breach of the Regulations if the Notices have not been submitted to the relevant network operator within the required time frame.

Continued over page

Continued from previous page

In April 2015 EnergySafety implemented a new Compliance Management System (CMS) that streamlines the workflow processes. This new compliance system will not accept Preliminary Notices and Notices of Completion without an address and postcode.

For remote installations such as mine sites where a postcode is unknown, please provide the postcode for the nearest town.

It would be extremely useful to record the GPS coordinates of the site on all Notices for installations in remote locations.

Inadequate checking and testing for overhead to underground changeovers

EnergySafety reminds all electrical contractors to ensure their electricians (including contract electricians) are diligently adhering to their checking and testing procedures and consistently using their checking and testing sheets. This comes after two similar convictions due to electricians failing to adequately check and test completed changeover work.

In the first instance, a contract electrician permitted an unsafe installation to be connected to the electricity supply at a property in Karratha.

The electrician was undertaking work, on behalf of Horizon Power, as part of its Pilbara Underground Power Project (PUPP) in readiness for the changeover of an overhead to a new underground consumer mains cable.

While undertaking this work, the electrician disconnected the electricity supply to the installation's main switchboard by isolating the electricity supply at the service protective devices (SPDs) located in the kWh meter panel.

When the electrician's employer (electrical contractor) went to site to connect the house to the underground network, he found the load neutral conductors from the kWh meter had not been connected at the neutral bar on the consumer's panel at the main switchboard.

The contract electrician had failed to terminate the neutral conductor on the load side from the Horizon Power kWh meter into the neutral link. This caused the installation to be unsafe.

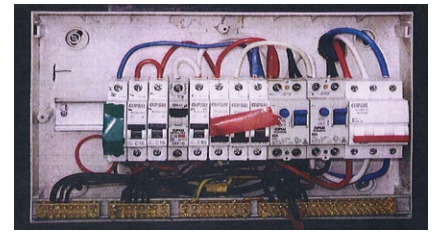
The electrical contractor reported the defect to Horizon Power, rectified the unsafe installation and reconnected the electricity supply after testing.

The electrician pleaded guilty in Karratha's Magistrate's Court and was convicted and fined \$7,000 with court costs of \$719.30 for this serious breach.

In the second instance, an electrical contractor was prosecuted for submitting a Notice of Completion to Western Power for electrical work associated with the change-over from overhead to underground supply at a property in Morley.

This work was identified to be substandard and incomplete when a Western Power Inspector carried out an inspection. He identified the neutral conductor on the load side from the kWh meter had not been connected to the neutral bar in the main switchboard.

As the installation had been connected to the electricity supply, the Inspector then removed the fuses from the main switchboard



Main switchboard showing the load neutral conductor from the kWh meter that was not connected to the neutral bar

and placed a 'Danger' tag on it to make the installation safe.

The electrical contractor was subsequently convicted and fined \$3,000 with court costs of \$4,615.30.

In both instances, as the meter load neutral conductors were not connected to the neutral link, the electric current would have been re-directed via the consumers multiple earthed neutral (MEN) connection (link) at the main switchboard through to the earthing system. The earthing system and any exposed metal on the installation would have become live and dangerous if left in that condition.

These investigations revealed checking and testing carried out were grossly deficient. Had the electricians who carried out the checking and testing performed a visual check and a circuit-connections test on completion of the work, they would have been alerted to the defects.

It was fortunate the residents of these properties were not at home at the time, for if one of them had come into contact with any of the live parts of the installation, they could have received a fatal electric shock.

EnergySafety recommends that electrical contractors regularly review their employees' test-sheets to confirm that proper checking and testing is being carried out while also ensuring work is completed to the relevant standard. Contractors should conduct regular site inspections to gauge their employees' standard of work and work practices.

Q & A's – Notices

The following is a compilation of some of the most common queries that EnergySafety receives from electrical contractors concerning Preliminary Notices and Notices of Completion:

	QUESTION	ANSWER FROM ENERGYSAFETY
1.	How long before I start work on a job is a Preliminary Notice required to be submitted to the relevant network operator?	If you are seeking advice from a network operator, the Preliminary Notice is required to be submitted at least three working days before the proposed notifiable work commences. If advice is not sought, the Preliminary Notice can be submitted at any stage before the proposed work commences.
2.	Where do I submit Notices if I can't identify who the relevant network operator is?	In instances when the network operator cannot be identified, Notices are to be submitted to EnergySafety.
3.	How long after I complete a notifiable job is a Notice of Completion required to be submitted to the network operator?	Within the period of three days after the completion of the notifiable work.
4.	How do I deliver Notices to the network operator?	Notices can be submitted to the network operator via facsimile or email.
5.	How long after a job is completed must I retain copies of Notices of Completion?	Notices of Completion are to be kept for a period of five years after the completion of the notifiable work.
6.	When is notifiable work deemed to have been completed?	Notifiable work is completed when the installation: <ul style="list-style-type: none"> a) is in use; b) is connected to the electricity supply or a private generating plant, or, can be connected to the electricity supply or a private generating plant without the use of tools; or c) is ready to be connected to the electricity supply or a private generating plant.
7.	If there is more than one electrical contractor working on a site, which electrical contractor submits Notices to the relevant network operator?	Each electrical contractor on site must submit Notices for their portion of notifiable work carried out. Each Notice should describe the portion of work that was carried out by each electrical contractor.
8.	If I am working on a mine site, am I required to submit Notices?	Notices are not required to be submitted to the relevant network operator, unless, the work involves: <ul style="list-style-type: none"> a) An initial connection to distribution works or a private generating plant. b) An alteration to a main switchboard. c) An alteration to service apparatus or distribution works. d) The installation or removal of a private generating plant. e) The alteration of the rated power of a private generating plant.

Continued over page

Continued from previous page

	QUESTION	ANSWER FROM ENERGYSAFETY
9.	What address do I supply when I am working at a remote location?	To facilitate inspections to be carried out at remote installations, additional location details are to be supplied under the Directions section of the Notice, such as, the distance of the nearest intersection, or, GPS coordinates for the entrance to the property. It is not sufficient to provide the name of a road and a locality/suburb only. A telephone number and/or email address for the owner/occupier is also beneficial.
10.	What action do I take if the notifiable work carried out differs from the work described in the Preliminary Notice?	As the details from the Preliminary Notice copy through to the Notice of Completion, you must amend the Notice of Completion accordingly.
11.	Where can I obtain more books of Preliminary Notices and Notices of Completion?	Contact EnergySafety's Licensing office: Telephone: 6251 2000 Fax: 6251 1902 Email: energysafety@commerce.wa.gov.au
12.	Can anyone other than the electrical contractor or the electrical contractor's nominee sign off on a Notice?	No. If anyone other than the electrical contractor or authorised nominee signs off on a Notice, they are committing an offence and the Notice will be deemed to not have been duly completed.
13.	The electrical installing work for which I am submitting a Notice was carried out on a mine site. As it is a mine site, there aren't many address details which I can provide. How much information is expected to be inputted in the address details section?	Once again, it is not sufficient to only provide the site name, a road and a locality/suburb. A post code is also required.

Electrical fitter fined for carrying out electrical installing work

An electrical worker whose licence was endorsed 'electrical fitting work only', has pleaded guilty in Bunbury Magistrate's Court to multiple breaches of regulation 19(1) of the Electricity (Licensing) Regulations 1991, for carrying out electrical installing work without holding an electrician's licence. The offences were committed between March 2009 and April 2013. At the time of the offences, the electrical worker was employed by an electrical contractor who instructed him to carry out unauthorised electrical installing work.

The investigation found that:

- The electrical contractor (who employed the electrical worker) had sighted his electrical worker's licence at the time of employing him. The employer was aware that the licence was restricted to 'fitting work only' and accepted the worker's explanation, that he "was having his licence sorted out".
- When the worker's licence expired in 2012, the electrical contractor failed to sight the restored licence.



Continued over page

Continued from previous page

Holding an electrical worker's licence endorsed 'electrical fitting work only' does **not** authorise the licence holder to carry out any electrical installing work. For carrying out the unlicensed electrical work, the electrical worker was fined \$2,800 with court costs of \$669.30.

The electrical contractor was fined \$15,000 with court costs of \$1,244 for employing and instructing the electrical worker to carry out electrical installing work while his licence was endorsed 'electrical fitting work only' for breaches of regulation 53(2) of the Electricity (Licensing) Regulations 1991.

There is a substantial difference between electrical fitting and installing work. Installing work includes selecting, assembling, installing, testing and commissioning of electrical equipment and electrical installations. This includes selecting correct cable sizes and installing them in accordance with AS/NZS 3000: 2007 – Wiring Rules.

On the other hand, electrical fitting work is limited to assembling testing, fault-finding, or repairing of electrical equipment and **is confined to work within a plant or machinery.**

To differentiate between the trades, EnergySafety issues two different licences – electrical fitter and electrician's licences. Electricians are allowed to perform fitting work.

EnergySafety is aware that some electrical fitters, after a few years in the trade, are keen to convert to an electrician's licence. A new pathway was implemented in July 2011 to cater for this need. Under this policy, holders of an electrician's licence endorsed 'electrical fitting work only' are allowed to apply for an electrician's provisional licence to carry out electrical installing work under supervision.

Upon receipt of the *Application for an Electrical Worker's Electrician's Provisional Licence to Work Under Supervision*, the Licensing Office will issue a *Training Record Logbook* to record all 'on-the-job' training. This form is available to download from the EnergySafety website www.energysafety.wa.gov.au.

All work carried out by the provisional licence holder during this time is to be regularly checked and tested by the supervising electrician to ensure the completed work is safe.

After completion of 12 months 'on-the-job' practical experience in electrical installing work under supervision and maintaining the logbook, the applicants are required to complete the Electrical Trades Licensing (ETL) course at one of the approved Registered Training Organisations (RTOs) before they can apply for the issue of an electrician's licence.

This case should serve as a reminder to all electrical workers that they must only do work which is within the respective scopes of their licences.

Electrical contractors are reminded about the following:

- the importance of ensuring that their electrical workers have the necessary licences i.e. the correct endorsement for the work being undertaken;
- all licences held by their employee electricians are valid and current (this can be checked on EnergySafety's website at www.energysafety.wa.gov.au); and
- the importance of maintaining and updating a record of all licences held by electrical workers they employ (as required by Regulation 57).

Standards update

New Standards

STANDARD	PUBLISHED DATE
AS/NZS 3117: 2015 – Approval and test specification, Bayonet lampholders	23 January 2015
AS 2832.1: 2015 – Cathodic protection of metals, Pipes and cables	27 January 2015
AS/NZS IEC 62271.4: 2015 – High voltage switchgear and controlgear, Part 4: Handling procedures for sulphur hexafluoride (SF6) and its mixtures	28 January 2015
AS/NZS IEC 62271.105: 2015 – High voltage switchgear and control gear, Alternating current switch-fuse combinations for rated voltages above 1 kV up to and including 52 kV	28 January 2015
AS/NZS 3786: 2015 – Smoke alarms using scattered light, transmitted light or ionization	16 February 2015
AS/NZS 61386.1: 2015 – Conduit systems for cable management, General requirements	10 February 2015
AS/NZS 61386.21: 2015 – Conduit systems for cable management, Particular requirements, Rigid conduit systems	10 February 2015

Continued over page

Continued from previous page

New Standards

STANDARD	PUBLISHED DATE
AS/NZS 61386.22: 2015 – Conduit systems for cable management, Particular requirements, Pliable conduit systems	10 February 2015
AS/NZS 61386.23: 2015 – Conduit systems for cable management, Particular requirements, Flexible conduit systems	10 February 2015

Amendments

AMENDMENT	PUBLISHED DATE
AS/NZS 3003: 2011/Amendment 1: 2015 – Electrical installations, patient areas	20 February 2015

Drafts for Public Comment

STANDARD	CLOSING DATE FOR COMMENTS
DR AS/NZS 3131: 2015 – Approval and test specification, Plugs and socket outlets for stationary appliances	15 April 2015
DR 14921 AS/NZS 4417.2: 2012 – Amendment 2 Regulatory compliance mark for electrical and electronic equipment	15 May 2015

Your apprentice is *your* responsibility

In *Energy Bulletin issue No. 66*, April 2014 *EnergySafety* drew attention to several investigations involving electrical contractors who had employed unlicensed apprentices.

Recently an electrical contractor was prosecuted in Perth Magistrate's Court for employing, engaging and instructing an apprentice to carry out electrical work (including commercial, domestic and maintenance work) for a period of almost five years between 2008 and 2013.

These breaches of the Regulations were only discovered when the apprentice submitted an application for his electrician's licence to *EnergySafety's* Licensing Office on completion of his apprenticeship.

As stated in *EnergySafety's Apprentice Safety Assessment Guidelines*, it is the responsibility of the employer to ensure the apprentice is appropriately licensed before commencing work. Failure to meet this obligation will result in prosecution action.

It is essential for an apprentice to hold an Electrician's Training Licence throughout the **entire** duration of their apprenticeship, as this signals that the apprentice has understood the requirements of the Guidelines, including:

- electric shock rescue, resuscitation and reporting procedures;
- occupational Safety and Health;
- appropriate clothing and personal safety equipment;
- the responsibilities of their supervising electrician;

- isolation, tagging and testing;
- safe work practices; and
- the dangers of working with electricity.

Energy Bulletin issue No. 69 details the responsibilities of an electrical contractor when taking on an apprentice.

EnergySafety has reminded electrical contractors previously about their responsibility to apprentices through articles in the *Energy Bulletin* (Issues 69, 68, 67, 66, 65, 60, 58, 56, 51 and 48). It appears this message is not being taken seriously.

Powers of licence inspectors

EnergySafety has recently investigated several complaints against licence inspectors allegedly abusing their powers.

Two complaints involved Licence Inspectors attending work sites without providing advance notification of their intended visits. In these instances, both Inspectors were found to be acting well within their designated powers under the *Energy Coordination Act 1994*, Section 14(a).

In the third complaint, a Licence Inspector entered a construction site and found some temporary wiring on a generator which in his opinion was defective. As there were no electricians on site at the time, the Inspector reported this defective work to the Site Manager and proceeded to turn off the generator himself and cut the three active and one neutral conductor terminated at the generator. In this instance, the Inspector was acting outside the scope of his powers and appropriate action was taken by EnergySafety.

If you have concerns about the activities of a licence or network operator inspector, please contact EnergySafety's Electricity Compliance Directorate on 6251 1905 to report the matter.

Over the years, EnergySafety has designated several electricians employed by the Communication, Electrical and Plumbing Union (CEPU) to the role of Licence Inspector under the *Energy Coordination Act 1994* and the *Electricity Act 1945*, Sections 14(a), 14(b) and 14(d)(i).

These License Inspectors have the power to inspect electrical licences and the electrical contractor's licence register to ensure that

workers are appropriately licensed and can request any information related to electrical licensing.

Unlike the designated network operator inspectors they cannot inspect any installation. Only designated Inspectors (Electricity) are authorised to:

- enter any land, premise or thing without any notice where there is reason to believe that the generation, transmission, distribution, supply or use of electricity may be taking place;
- require the person who owns or controls access to the land, premise or thing to allow reasonable access and assistance;
- inspect any plant, works, installation, component or activity used for, or intended to be used for in the connection with the generation, transmission, distribution, supply or use of electricity; and
- inspect, examine, sample or request any information and provide any record or document.

Work on transportable structures and vehicles

Electrical contractors working on transportable structures and vehicles (e.g. sea containers, campervans, modular kit homes, caravans, food and drink vending vans etc) are reminded of the importance of the following:

1. Before the transportable dwelling is connected to the electricity supply, it is to be checked and tested as per AS/NZS 3000: 2007 – Wiring Rules and the relevant standard AS/NZS 3001: 2008 – Electrical

installations – Transportable structures and vehicles including their site supply.

2. Preliminary Notices and Notices of Completion are required to be submitted to the relevant network operator if they are to be newly connected to the electricity supply.
3. If work is being carried out on the transportable at one site, before it is relocated and connected to the electricity supply at another, Notices are to be submitted to the network operator in the region where the transportable is to be connected.
4. If the relevant network operator cannot be identified, Notices are to be submitted to EnergySafety.
5. An Electrical Safety Certificate must be provided to the person/company requesting the work to be carried out.

This reminder has been prompted by an investigation involving an electrical contractor who failed to adequately check and test a transportable house after it had been connected to the electricity supply.

After the work on the transportable was completed, the electrical contractor failed to carry out all the required checks and tests to ensure the installation was safe. Instead he relied on the Installation Test Certificate that had been placed in the meter box by the electrical contractor who had pre-wired the transportable.

This failure to adequately check and test resulted in a number of serious defects, including the failure to install a multiple earthed neutral (MEN) connection and installation of an air-conditioner condensing unit that was installed near gas cylinders (restricted zone).

Electricity safety statistics

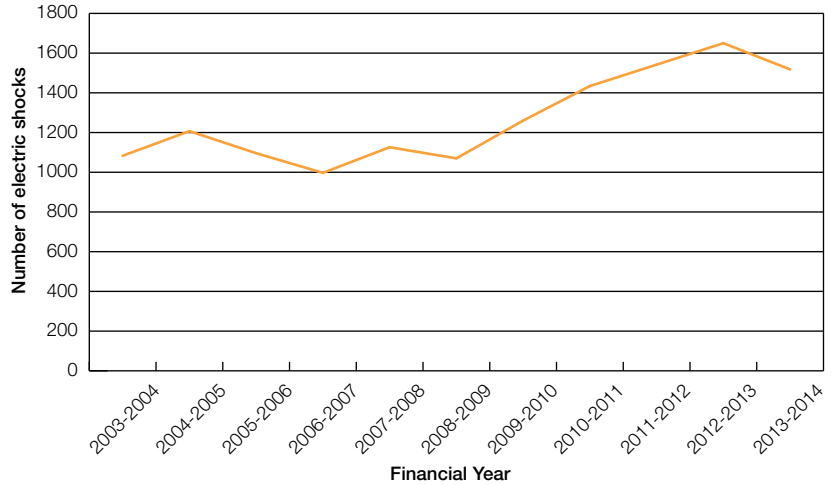
The following charts detail the number of electric shock and accidents (including fatalities) reported to EnergySafety in the last ten financial reporting years.

An electric shock is defined as an incident that does not require medical or first aid treatment.

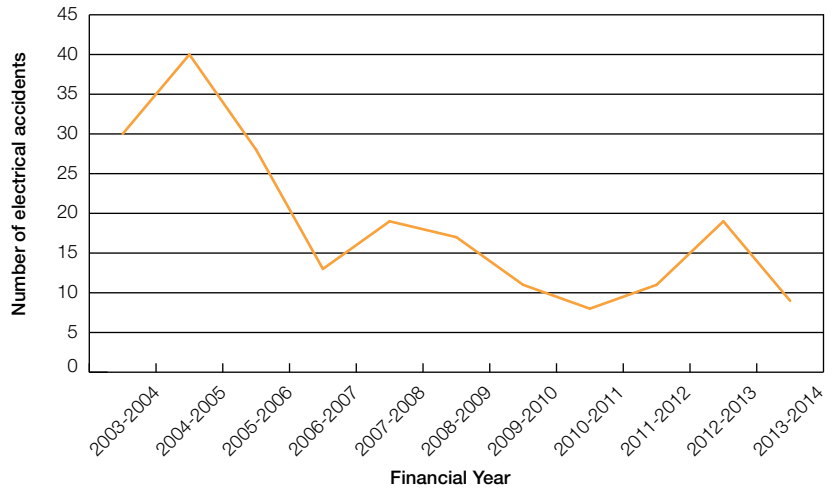
An electrical accident is defined as an incident that results from a sudden discharge of electricity, or, that otherwise has, or is likely to have, an electrical origin and causes, or is likely to cause, danger to life, shock or injury to a person or loss of or damage to property, which required medical or first aid treatment. This also includes fatalities.

NB: The data is based on date of incident.

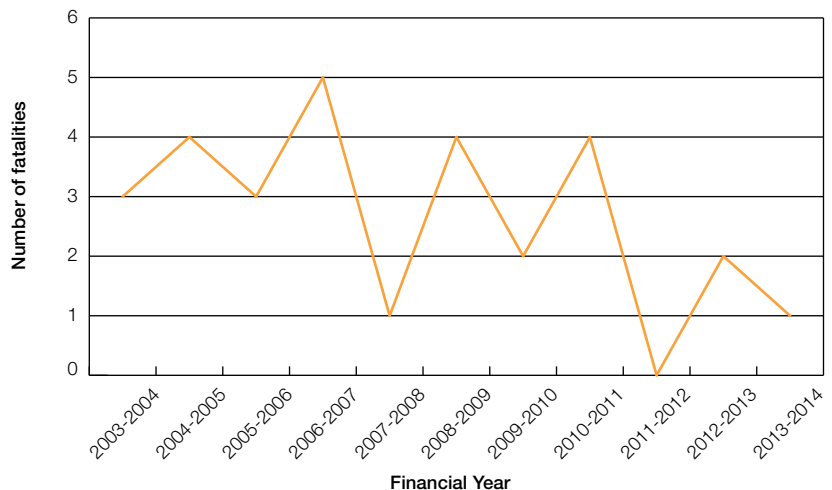
Electric shocks reported to EnergySafety 2004-2014



Electrical accidents reported to EnergySafety 2004-2014



Fatalities attributed to electricity reported to EnergySafety 2004-2014



New Code of Practice for Electrical Inspectors published

A comprehensive review of the Code of Practice for Inspectors (Electricity) in Western Australia (Code) has been completed.

The new Code will be published on 1 May 2015, with effect from that date.

The revisions are extensive and the document has been completely rewritten. Electrical inspectors and contractors are urged to familiarise themselves with the changes.

Purpose

The Code provides information on the designation, powers and limitations of an electrical inspector under the *Energy Coordination Act 1994* and the standard of conduct that inspectors are expected to maintain when carrying out their duties.

It is designed to assist people designated or planning to be designated as an Inspector (Electricity).

The provisions of the Code are not made mandatory by legislation or regulation at this stage.

Changes

The revised Code replaces the current version which has remained unchanged since its original publication in 2002.

The main changes are:

- (i) Splitting the current document into three new documents:
 - the new Code of Practice;
 - application and renewal of designations (procedural); and
 - procedure for appealing against an Inspector's Order.
- (ii) Enhancing the conduct required of inspectors as 'public officers' by incorporating general and particular requirements of the public sector Code of Ethics and Conduct Guide.

Development

Development of the new Code and related procedures included substantial engagement with network operators and electrical contracting associations with a four week consultation period in February 2015.

Written submissions were received from these parties and EnergySafety has considered and responded to all matters raised in the submissions.

Implementation

The revised Code and related procedures will be published on Friday 1 May 2015, becoming effective on that date.

A formal notice of publication will be placed in the Government Gazette.

It is important that both inspectors and contractors familiarise themselves with the new Code and related procedures.

The new documents are being sent by email to all designated inspectors.

Copies can also be downloaded from EnergySafety's website at www.energysafety.wa.gov.au

Operation and maintenance of oil-filled HV combined-fuse switches

In April 2014, EnergySafety published *Guidelines for the safe management of high voltage electrical installations*. The purpose of the document was to provide advice to 'responsible persons' for premises with high voltage (HV) electrical installations.

Following the issue of Inspectors Orders Nos 01-2015 and 02-2015 restricting certain work practices on oil-filled combined-fuse switches, EnergySafety has published a supporting document to the Guidelines, *Operation and maintenance of oil-filled HV combined-fuse switches*, which provides further advice to operators and 'responsible persons' for installations with HV equipment.

The publication focuses on oil-filled HV switchgear and outlines the requirements for:

- auditing of existing assets;
- normal operation of oil-filled HV combined-fuse switches;
- post-fault operation of oil-filled HV combined-fuse switches; and
- maintenance of oil-filled switches.

A copy of the Guidelines and supporting document can be downloaded from EnergySafety's website www.energysafety.wa.gov.au

Prosecutions for breaches of electricity legislation

Between 1 January to 31 March 2015

Name (and suburb of residence at time of offence)	Licence No.	Legislation and Breach	Offence	Date of Offence	Fine (\$)	Court Costs (\$)
Luke Tillman (Donnybrook)	EW143885	Regulation 49(1) E(L)R 1991	Carried out unsafe and substandard electrical work	Between 12/02/13 and 19/02/13	5,000.00	719.30
Gerard Brady (Bayswater)	EW177663	Regulation 50A E(L)R 1991	Permitted an unsafe installation to be connected to the electricity supply	03/10/12	7,000.00	719.30
Richard Warren Deverneuil T/As Impala Electrical Contractors (Two Rocks)	EC008435	Regulation 52(3) E(L)R 1991	Submitting a Notice of Completion to the relevant network operator for notifiable electrical installing work that had not been completed	26/06/12	3,000.00	4,615.30
C.E. Oates & Sons Pty Ltd T/As Narrogin Retravisision (Narrogin)	EC001070	Regulation 52(3) E(L)R 1991	Submitting a Notice of Completion to the relevant network operator for notifiable electrical installing work that had not been completed	04/02/13	68,000.00	625.00
Adrian Bradbury T/As Activated Electrics (Balga)	EC007542	Regulation 53(2) E(L)R 1991	Employing, engaging and instructing an unlicensed person to carry out electrical installing work while not authorised by a licence or permit	Between 25/08/08 and 30/01/13	2,000.00	719.30
JCW Electrical Pty Ltd (Bunbury)	EC008492	Regulation 53(2) E(L)R 1991 (6 breaches)	Employing, engaging and instructing an unlicensed person to carry out electrical installing work while not authorised by a licence or permit	Between 28/11/12 and 17/12/12	15,000	1,244.00

Summary of Infringements for breaches of electricity legislation

Between 1 January and 31 March 2015

Legislation and breach	Offence	Number of Infringements	Fine (\$)
Regulation 33B(2) EA 1945	Selling or hiring, or exposing or advertising for sale or hire, prescribed appliance without approval	5	13,300.00

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

g | a | s

focus

New edition of AS 3814 published

Standards Australia has released a new edition of AS 3814: 2015 – Industrial and commercial gas-fired appliances. In Western Australia Type B appliances are required to comply with this standard.

The revision of the standard focused on the requirements for gas engines and gas turbines; aligning these with new technology and process requirements introduced since the 2009 edition was published. Some of the changes are:

- the adoption of AS ISO 21789 Gas turbine applications— safety as complying with the intent of AS 3814;
- a gas engine with a maximum gas input not exceeding 5 GJ/h that complies with ANSI/UL 2200 is deemed to comply with many of the requirements of AS 3814;
- where a gas engine or turbine is located outdoors and the maximum gas consumption does not exceed 500 MJ a single class 1 safety shut-off valve can be used;
- a gas engine or gas turbine does not require purging where the exhaust system is strong enough to withstand an explosion or is fitted with explosion relief;
- gas turbines and associated fired waste heat steam generators can now qualify for purge credits; and

- gas engines and gas turbines are no longer subject to a 400 ppm Carbon Monoxide limit. Note: these appliances may be subject to limits imposed by other legislation.

The requirements of the standard have also been significantly changed to recognise the role of risk analysis and compliance of electronic control systems with AS 61508, AS 62061, AS IEC 61511 or ISO 13849-1.

The standard was published on 18 February 2015 and automatically adopted from this date. The regulations provide for a six month period where the superseded edition (AS 3814-2009) is deemed to comply with the current edition (AS 3814:2015). Although there is the six month period where both editions are acceptable we recommend that you adopt the 2015 edition as soon as practical. The standard can be purchased at <http://infostore.saiglobal.com/store/>

Multistorey residential compliance project

Since mid-2013 EnergySafety has been actively reviewing multistorey residential compliance. A unique opportunity arose to inspect and review consumer installations by working closely with the gas distribution network operator, ATCO Gas Australia on their multistorey buildings upgrade project.

Part of the work on this project requires isolating the gas supply to the building and consumer installations. EnergySafety Inspectors have worked with ATCO Gas Inspectors and taken advantage of this opportunity to address safety and compliance issues including gas tightness testing and appliance inspections.

EnergySafety is also carrying out multistorey building inspections separate from ATCO Gas Australia's project, which are usually instigated by gasfitter enquiries. These enquiries result in the whole multistorey residence being assessed rather than just the individual residence. These inspections complement ATCO Gas' project and can reveal multistorey residences that require more urgent attention.

The multistorey residential compliance project also provides the opportunity to:

- introduce modern higher efficiency gas appliances, to improve overall consumer appliance safety, particularly fan assisted water heaters with reduced flue terminal separation distances;
- check for non-flued appliances installed in sleeping areas;
- check for non-room sealed water heaters inside the residence or inside bathrooms; and
- check for pre-1980 appliances which are possibly incompatible with the current natural gas supply composition.

Continued over page

Continued from previous page

Multistorey residences comprise of two types of supply configurations;

- Where master meters are installed on consumer premises all the pipework, fittings and equipment installed on the upstream side of the master meter is considered the responsibility of the network operator, ATCO Gas Australia, and includes the meter itself. Downstream of the master meter is the consumer's gas installation.
- Where sub-meters are installed on consumer premises all the pipework, fittings and gas appliances installed on the upstream and downstream side of the sub meter is considered the consumer's gas installation. Sub-meters are only fitted downstream of a master meter.

The consumer is responsible for maintaining a safe installation which complies with the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999. In the case of multistorey residences, the consumers are usually a group of owners, commonly administrated by a Strata Manager.

Strata Managers and the owners engage with ATCO Gas' multistorey buildings upgrade project personnel at an early stage to ensure any issues with safety and compliance are understood, addressed and resolved.

To date, gas water heater installations represent the highest quantity of non-compliance to the current Regulatory requirements. The non-compliance issues are usually to do with inadequate flue terminal separation clearances including overhead projections, openings into buildings, external and return walls.

Also water heaters placed in a position outside the balcony area and in a location not considered to be accessible to safely service the appliance and non-compliant to the 2.5m maximum height requirement above the ground or floor level, including for example, on a wall up to 10 storey's high with no suitable means of access.

One particular multistorey residence had old balanced flue water heaters encased in combustible chipboard with gas meters fitted directly below in a similar chipboard cupboard. Another example is internal balanced flue water heaters with flue terminals originally installed within access corridors with adequate cross flow ventilation, that have become non-compliant due to building modifications, such as sealing off the ends of corridors with windows to stop wind and rain.

Examples of non-compliance



Original water heater locations

The majority of water heaters were mounted within a chipboard combustible box and the gas meters were mounted in the same box below the water heaters.



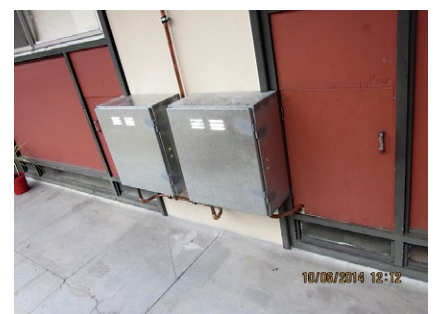
New locations

The non-complying water heater installations were replaced with fan assisted units, mounted on non-combustible materials and the gas meters relocated in metal boxes away from the water heaters.



Meter in a combustible box and under kitchen bench

Existing sub-meter installations were installed in locations considered not to comply with current requirements, typically in areas not sealed from wall cavities and effectively inside the units and not ventilated to the outside.



New meter locations

Continued over page

Continued from previous page



Non-compliant locations

A number of water heaters were outside the line of the balcony. The water heaters are too high off the ground to comply, as well as the Occupational Health and Safety considerations of working off the side of a balcony or landing.



New locations

The non-complying installations were replaced with fan assisted units, in locations suitable for safe access.



Original sealed corridors

Internal water heaters with flue terminals originally installed within access corridors with adequate cross flow ventilation, that have become non-compliant due to building modifications, by sealing off the ends of corridors with windows to stop wind and rain.



Louvered fixed vents installed



Left hand side internal water heater installed outdoors

There was an internal water heater installed in a bank of external water heaters. The internal unit is not designed for outdoors use.



Internal water heater replaced with outdoor unit

Safety precautions when carrying out hot works in the vicinity of gas infrastructure

In a recent incident, a plumber was connecting reticulation pipework in close proximity to a polyethylene (PE) gas service. The plumber had correctly identified the gas service and attempted to protect it from the oxy-acetylene torch (oxy-torch) he was using by inserting a sheet of fibre cement board behind the weld location. However, the piece of fibre cement board was not long enough to protect the gas service pipe and, whilst fitting the new connection, heat from the oxy-torch travelled down the fibre cement board and damaged the gas service, weakening the pipe wall. Internal gas pressures within the pipe caused it to rupture and the escaping gas ignited on the flame of the oxy-torch. The resulting gas service fire caused bush and property damage.

In separate recent incidents, gas service pipes were not exposed, instead they were found to be buried under 100-200mm of sand below the water service pipes. In these instances, the sand absorbed the heat from the oxy-torch and the gas service was weakened by the heated sand rather than directly from the oxy-torch. These situations can be extremely dangerous if the plumber involved is unaware of the existence of the live gas service in their area of work and/or has not used appropriate measures to protect the gas pipe.

Fortunately, the gas service lines damaged during these recent incidents have all been located in areas which operate at a lower gas pressure (7-40kPa); however, in certain areas within ATCO Gas Australia's gas network, service

Continued over page

Continued from previous page

lines operate at higher pressures (up to 350kPa) which can pose an even greater risk of injury and property damage. In both high pressure and low pressure locations, it is possible for the internal gas pressure to burst the weakened pipe wall, potentially causing an intense fire.

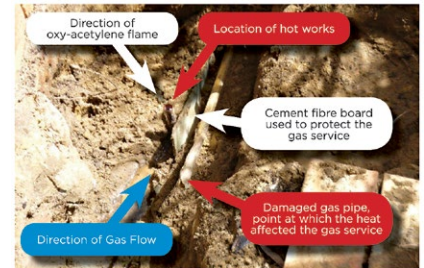
What precautions can I take to help prevent a gas service pipe fire?

1. It is good practise to check the location of all underground assets in your work area prior to commencing work. If gas is connected to the residence, a gas meter box will be on the

front of, or near the front of, the property. The gas service is laid at right angles to the gas main connection in the street and any variations to this should be detailed on the service information sticker diagram inside the gas meter box.

2. Always use appropriate heat-shielding equipment to protect the gas service pipe prior to commencing hot works.
3. Alternatively, ATCO Gas Australia recommends the use of approved copper pipe mechanical press fit tools as they mitigate the hazards associated with completing hot works altogether.

It should also be noted that in incidents where individuals are found to be at fault, costs associated with ATCO Gas Australia repair and response will be recovered from the individual or company at fault.



Work area for recent gas service fire

For more Information, please contact the ATCO Gas Australia scheduling centre on 13 13 56.

Article kindly supplied by ATCO Gas Australia

Prosecutions for breaches of gas legislation

1 January 2015 to 31 March 2015

Name (and suburb of residence at time of offence)	Licence No.	Legislation and Breach	Offence	Fine (\$)	Court Costs (\$)
<i>Stewart Tuckfield</i>	<i>N/A</i>	<i>GSA 1972 S13(A)(2)</i>	<i>Engaging in an operation, or carrying out work or process without a certificate of competency, permit or authorisation.</i>	<i>20,000</i>	<i>1262.65</i>

Legend NLH No Licence Held

GSA Gas Standards Act 1972

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

Summary of infringements for breaches of gas legislation

1 January to 31 March 2015

Legislation and Breach	Offence	Number of Infringements	Fine (\$)
GSR R18(2)	<i>Failing to ensure gas installation complies with prescribed requirements</i>	2	1, 200
GSR R26(1)(a)	<i>Failing to ensure gas installation meets requirements as to pressure testing and is gas tight.</i>	1	600
GSR R28(2)	<i>Failing to attach approved badge or label to gas installation upon completion of gasfitting work</i>	1	400
GSR R28(3)	<i>Failing to give notice of completion of gasfitting work within required time</i>	1	400
GSR R 34(1)	<i>Failing to keep records of employed gas fitters in required manner.</i>	1	250
	Total:	6	2,850

Legend NLH No License Held

GSA Gas Standards Act 1972

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