

Annual Report of the Technical Regulator 2018-19

Technical Regulator South Australia

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Government
of South Australia

Annual Report of the Technical Regulator 2018-19

This document describes the operations of the Technical Regulator in the electrical, gas, plumbing and water industries.

Appendix 1 of the document presents specific results achieved during the financial year 2018-19.

The Technical Regulator is a statutory office established by:

- Section 7 of the *Electricity Act 1996*;
- Section 7 of the *Gas Act 1997*; and
- Section 8 of the *Water Industry Act 2012*.

Robert Faunt has held this office since he was appointed as the Technical Regulator under the *Electricity Act 1996* and the *Gas Act 1997* on 28 February 2003, and since he was appointed as the Technical Regulator under the *Water Industry Act 2012* in 2012.

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The Office of the Technical Regulator

Section 1: Overall Background

The Office of the Technical Regulator (OTR) assists the Technical Regulator in the performance of his functions and the exercise of his powers under the *Electricity Act 1996*, the *Gas Act 1997* and the *Water Industry Act 2012* (the Acts).

The Technical Regulator is responsible to the South Australian Government for the safety and technical performance of the electrical, gas, and water industries. The Technical Regulator also works towards ensuring community safety by promoting and enforcing safety measures and Standards across electrical, gas and plumbing appliances, installations and infrastructure. To fulfil this responsibility, the Technical Regulator carries out an extensive range of activities, including but not limited to providing technical and safety education and advice, incident inspection and investigation activities and audit activities.

The Technical Regulator plays also an important role in the development and monitoring of applicable State and National safety and technical Standards and Codes. The Technical Regulator provides technical support and advice on issues to the relevant Ministers and facilitates discussions with industry stakeholders to achieve the best possible outcome for South Australia.

Appendix 1 of the document presents specific results achieved during the last financial year while the flow chart in Appendix 2 summarises the activities through which the Technical Regulator fulfils his obligations under the various Acts and Regulations.

Section 2: Technical and Safety Regulation

The technical and safety regulation regime is in accordance with the Acts and includes the following components.

2.1. Technical Review of Infrastructure Licence Applications

The Essential Services Commission of South Australia (the Commission) licenses entities under the Acts, and provide the following licences:

- a licence authorising the generation of electricity or the operation of a transmission or distribution network;
- a licence authorising the operation of a gas distribution system;
- a licence authorising the provision of water and/or sewerage retail services.

Entities that have applied for and received a licence exemption may not be exempted from their responsibilities to the Technical Regulator under the Acts.

All licensing requirements can be found on the Commission's website, <http://www.escosa.sa.gov.au/>. Licence applications to the Commission must include organisational, commercial and technical information. Technical information is referred to the Technical Regulator for review and a response is provided to the Commission for consideration during their licence application assessment.

2.2. Safety, Reliability, Maintenance and Technical Management Plan

The Technical Regulator may or will, depending upon the Act, require the entities licensed by the Commission to prepare and periodically revise a safety, reliability, maintenance and technical management plan (SRMTMP).

A SRMTMP is a high-level document relating to the operational Standards, which define key performance indicators to measure the actual performance of an entity. It provides an auditable quality approach to industry safety and technical performance, encouraging the continuous improvement of safety systems and technical compliance.

The SRMTMP addresses issues relating to the technical Standards, operating and maintenance procedures and management practices, including safety requirements, applicable to an entity. The SRMTMP demonstrates the means by which the entity will comply with the direct requirements of the legislation as well as the Standards and Codes called up by the legislation.

The overall information that a SRMTMP must address is defined in the *Electricity (General) Regulations 2012*, the *Gas Regulations 2012* and the *Water Industry Regulations 2012* (the Regulations). Guidance documents and general information for preparing SRMTMPs are also available on the OTR website to assist entities.

The Technical Regulator reviews an entity's SRMTMP and, where appropriate, provides direction and makes recommendations or comments to assist in refining it before its final approval. The Technical Regulator is directly responsible for the approval of the SRMTMP for the three industries.

2.3. Audits of Compliance

2.3.1. Infrastructure internal audits

Following the submission and subsequent approval of a SRMTMP, an entity must complete annual internal audits which confirm compliance with its SRMTMP. Those internal audits can be completed by the entity itself or by a third party. Any findings from the internal audits are reported to the Technical Regulator for review and comments. Once the Technical Regulator is satisfied that the entity has addressed all identified issues and complied with its SRMTMP, the entity then updates the plan to include required changes identified in the audit and any recommendations from the Technical Regulator.

2.3.2. Infrastructure audits by the Technical Regulator

In addition to the annual internal audits, the Technical Regulator completes independent safety and technical audits to verify the accuracy of information provided and compliance with an entity's SRMTMP. These audits ensure that safety and technical Standards are maintained in the electrical, gas and water industries by confirming that:

- appropriate systems and processes have been developed;
- compliance with these systems and processes is maintained;
- the systems and processes comply with the water industry entity's current approved SRMTMP.

The Technical Regulator conducts both field and desktop audits to confirm that the entity is operating in accordance with its policies and procedures to which ensure the safe and reliable operation of the infrastructure. Upon completion of an audit, the Technical Regulator provides the entity with a report of observations, and provides comments and/or recommendations.

Audits completed by the Technical Regulator also allow for the monitoring of technical safety and reliability trends within the electrical, gas and water industries and comparison to other National and Global industries.

2.3.3. Installations compliance audit

The Technical Regulator has a process in place whereby electrical, gas and plumbing domestic, commercial and industrial installations are monitored for compliance with the Acts, Regulations and relevant Standards.

Periodic (seasonal, recurring and ongoing) events are monitored to ensure the safety of the public and workers at the event in relation to the temporary and permanent electrical, gas and plumbing equipment

and installations. This is often done in conjunction with other relevant Authorities such as Safework SA or Consumer and Business Services.

2.4. Incidents Investigations

2.4.1. Infrastructure incidents

Infrastructure incidents that involve death, or injury to a person requiring medical assistance, property damage or any critical infrastructure failure, must be reported to the Technical Regulator under the *Electricity Act 1996* and the *Gas Act 1997*. Water infrastructure incidents shall also be reported to the Technical Regulator under a specific incident protocol. Incident reports are recorded by the Technical Regulator and, where appropriate, the incidents are investigated.

During major consumer outages and incidents, the Technical Regulator monitors the outage and assesses the adequacy of the response. This provides a level of confidence that the operational and maintenance strategy employed by the service providers is effective.

2.4.2. Installation incidents

Installation incidents are where an appliance or its installations is directly attributed to the cause of human death, injury or property damage. The Regulations require these events to be reported within specific time frames depending on severity.

These events are investigated by the Technical Regulator to determine the cause, often in conjunction with other relevant authorities or organisations, such as Metropolitan Fire Services (MFS), Country Fire Services (CFS), SA Police (SAPOL), SafeWork SA, and insurance companies. Incidents reported to the Technical Regulator are investigated and recorded. The OTR personnel may be called as witnesses in any subsequent legal action.

2.5. Electronic Certificate of Compliance

Certificates of Compliance are provided to property owners by an appropriately licensed person to demonstrate that they have met their duty to ensure that the electrical, gas fitting or plumbing works completed at their property is compliant.

The purpose of the certificate is to:

- enable self-certification of work;
- describe the works that have been completed;
- assure the customer that the work is installed and tested to the appropriate Standard;
- protect the licensed person by confining the responsibilities to the work that they have carried out;
- allow the Technical Regulator to audit installations for adherence to safety and technical Standards.

The OTR has transitioned from the previous paper-based process for electrical, gas and plumbing certificates of compliance to an automated electronic system called eCoC. In preparation for the use of eCoCs, changes were required to the *Electricity (General) Regulations 2012* and the *Gas Regulations 2012*. Changes were also required to the *Plumbing Certificate of Compliance Scheme* established by the Technical Regulator under section 69(2) of the *Water Industry Act 2012*. These changes were completed in late 2016 and mainly consisted of removal of references to paper forms, to allow eCoCs to be valid.

The eCoC system is free for electrical, gas and plumbing contractors and workers, and enables them to complete, submit, store and refer to certificates of compliance online. Contractors and workers can access the eCoC system via the internet from desktop and mobile devices. A one-time registration needs to be completed to use the eCoC system. Contractors and workers need to provide professional registration/licence number and expiry date, email address, a password and contractor/worker details.

Overall, the system is considered more flexible, being on a digital form, and more professional and continuous improvements are brought to the platform based on the feedback received from users. Any feedback on the system can be sent to otr.ecoc@sa.gov.au.

More information and updates on the eCoC project can be found on the OTR eCoC website: www.sa.gov.au/otr/ecoc

2.6. Technical Advisory Committees

Under the Acts, the Technical Regulator must establish an advisory committee (*technical advisory committee*) for each industry, including representatives of industry entities, contractor and employee associations involved in the industry, and local government.

The objective of those committees is to provide advice to the Technical Regulator, either on its own initiative or at the request of the Technical Regulator, on any matter relating to the functions of the Technical Regulator.

Section 3: Participation in Standards

The Technical Regulator is actively represented on a number of Australian Standards and joint Australian and New Zealand Standards Committees as well as on the Australian Building Codes Committees and International Standards. Committees relate to electrical and gas products, design, installation and commissioning of electrical installations, gas installations and on-site plumbing, and design, operations and maintenance of electrical, gas and water infrastructure. The Technical Regulator plays an important role in developing and maintaining these Standards and Codes.

Section 4: Emergency Management

The Technical Regulator works closely with relevant emergency management stakeholders to assist in ensuring the resilience of the state in case of an energy emergency, including the State Emergency Management Committee, SAPOL, the Australian Energy Market Operator (AEMO) and major SA energy entities. The OTR has several staff members rostered with the State Emergency Centre (SEC) to provide electricity, gas and fuel supply monitoring and engineering service advice during a state emergency.

The Technical Regulator plays a key role in the monitoring of the security of the power system in South Australia. The Technical Regulator works with the Bureau of Meteorology (BOM), and stakeholders within the electricity generation, transmission and distribution industries, to ensure that appropriate precautions are taken during times when there is a risk to the power system (i.e. large storm systems, bushfires, extreme temperatures, etc.).

During times when the load in South Australia may not be balanced by the electricity generation, the Technical Regulator will seek voluntary load reduction from large energy users across several industries. The Technical Regulator also manages the South Australian Electricity Manual Load Shedding List (the list) in cooperation with SA Power Networks, ElectraNet and AEMO. The list sets out the electrical circuits which should be tripped by the power system's automatic protection mechanisms or if AEMO instructs to reduce load to maintain the power system's security and integrity. The preparation of the list is an obligation on the Technical Regulator under the National Electricity Rules in his role as the Jurisdictional System Security Coordinator for South Australia.

The Technical Regulator has also the responsibility to assess and monitor any threatening situations in relation to gas supply and is required to manage an emergency where societal objectives can no longer be met by the market. Should an event occur, normally the Short Term Trading Market (STTM) for gas would be the first line of defence in managing any shortfall. The STTM is operated by AEMO and sets a daily price at each gas hub. It runs once a day, on the day ahead, for each hub. It utilises bids, offers, and

forecasts as submitted by the participants and the pipeline capacities to determine the schedules for the deliveries of gas. The STTM also operates a contingency gas market should gas supplies fall short of the estimated daily demand. The use of the contingency gas market will extend the use of market outcomes. If the shortfall is not resolved, the Technical Regulator would consider recommending that the Minister issue directions for temporary gas rationing.

Section 5: Consumer Safety Awareness

5.1. Assistance with the Development of Technical Training Courses

The Technical Regulator continues to liaise closely with Consumer and Business Services (CBS), TAFE SA / PEER VEET and Training Prospects about tradespeople training curriculums and competencies (CBS regulates the licensing of tradespeople under the *Plumbers, Gasfitters and Electricians Act 1995*).

Tailored safety presentations are given to apprentice groups at registered training organisations across the state. Presentations are also given to other groups such as professional associations and contractor groups on request.

5.2. Industry Roadshows

A key initiative of the OTR is Industry Roadshows where presentations are provided to electrical, gas and plumbing workers and contractors across South Australia. Roadshows are provided at all major population centres annually, and other regional areas less frequently, such as bi-annually, and are typically held in conjunction with industry associations. Roadshows provide an opportunity to share updates in electrical, gas and plumbing Standards and legislation, and obtain feedback from the industry.

5.3. Regulation Roundup

To keep the electrical, gas and plumbing industry informed, the Technical Regulator publishes biannually a joint electrical/gas/plumbing industry newsletter – Regulation Roundup. Prior to 2019, printed copies were sent to approximately 2,800 registered workers and licensed contractors in the State. Copies are also sent to interstate Technical Regulators and other interested parties in a reciprocal arrangement. As of late 2019, the Regulation Roundup will be solely dispatched electronically to contractors and workers as part of the Government initiative to embrace online communication.



Figure 1: Example of Regulation Roundup

5.4. Continuous Safety Promotion

Proactive awareness campaign

The 'Be Energy Safe' Campaign is facilitated by the Technical Regulator and reviewed annually. Its objective is to promote gas safety to the community by raising awareness of electrical and gas safety and influencing the general public to take the appropriate actions. The campaign involves the provision of messages which are promoted via advertising on Google and Facebook and during the radio traffic reports.

Previous key messages included:

- Carbon Monoxide (CO) awareness – do not bring outdoor gas appliances indoors – service your appliance regularly;
- Gas leaks should be reported via the Gas Emergency and Leak Reporting Service on 1800 GAS LEAK (1800 427 532);
- Plumbing, gas and electrical jobs should be done by a licensed person – not DIY businesses;
- Plumbing, gas and electrical works should come with a Certificate of Compliance;
- Barbecues should be serviced regularly to prevent gas leaks;
- Safety switch should be tested twice a year;
- Christmas lights should be checked for faults prior to being used.

The campaign is published by an advertising company and performance reports are provided regularly to the Technical Regulator to monitor the rate of penetration of the advertisements. Overall, the campaign is considered to achieve fair results. Some examples of the advertisements are shown below.



Take electrical and gas safety seriously. It could save a life.

Leave it to the pros. Use a licensed tradie, check their qualifications and get a Certificate of Compliance.

For more information, visit www.sa.gov.au/safety/licensedtrades



Take electrical and gas safety seriously. It could save a life.

Prevent fires, shocks and death by testing your electrical safety switches at least twice this year.

For more information, visit www.sa.gov.au/safety/switches



Take electrical and gas safety seriously. It could save a life.

Unsafe barbecues cause fires and injuries. Before using your barbecue, check the hose and connections for deterioration and gas leaks.

For more information, visit www.sa.gov.au/safety/barbecues



Figure 2: Example of electrical and gas safety advertisements

Reactive awareness campaign

Reactive safety awareness campaigns are undertaken by the Technical Regulator usually takes the form of a single or series of media releases around the topic of interest. Typically, this type of campaign is the result of an incident and ensures that the public receives correct and appropriate safety information.

OTR's Website

The OTR's websites include current content on technical regulation and safety issues at:

- www.sa.gov.au/otr for all technical information;
- www.sa.gov.au/energysafe for consumer safety information for gas and electricity.

5.5. Consumer Safety Survey

Every year, the Technical Regulator conducts a consumer safety survey to ascertain the public's knowledge of gas and electrical safety, and the effectiveness of the OTR's education campaigns and legislative functions. The survey is contracted to an external contractor using computer assisted telephone interview and online surveys, and approximately 600 households are interviewed, with two thirds located in the Adelaide metropolitan area and one third in SA regional areas. Questions used for the survey remain consistent to provide comparisons to previous results.

Section 6: Energy and Water Ombudsman South Australia

There is a Memorandum of Understanding (MOU) in place between the Technical Regulator and the Energy and Water Ombudsman South Australia (EWOSA). The MOU defines how the two bodies will interact to deal with customer complaints

The EWOSA seeks the Technical Regulator's advice on some occasions. In all cases, advice is sought on customer complaints received by the EWOSA that had resulted from the customer not being satisfied with the responses from the electricity entities. The technical input provided by the Technical Regulator assists the EWOSA in assessing a range of complex issues.

Volume I - Electricity Industry

Preface

This volume covers the Technical Regulator's operations under the *Electricity Act 1996* and the Technical Regulator's administration of the *Energy Products (Safety and Efficiency) Act 2000*.

Electricity Act 1996

Section 3 of the *Electricity Act 1996* states that:

"The objects of this Act are—

- (a) to promote efficiency and competition in the electricity supply industry; and
- (b) to promote the establishment and maintenance of a safe and efficient system of electricity generation, transmission, distribution and supply; and
- (c) to establish and enforce proper standards of safety, reliability and quality in the electricity supply industry; and
- (d) to establish and enforce proper safety and technical standards for electrical installations; and
- (e) to protect the interests of consumers of electricity."

Section 8 of the *Electricity Act 1996* states that:

"The Technical Regulator has the following functions:

- (a) the monitoring and regulation of safety and technical standards in the electricity supply industry; and
- (b) the monitoring and regulation of safety and technical standards with respect to electrical installations; and
- (c) the administration of the provisions of this Act relating to the clearance of vegetation from powerlines; and
- (ca) the monitoring and investigation of major interruptions to the electricity supply in the State and the provision of reports relating to such interruptions in accordance with any requirements prescribed by the regulations; and
- (d) any other functions prescribed by regulation or assigned to the Technical Regulator by or under this or any other Act."

Energy Products (Safety and Efficiency) Act 2000

The *Energy Products (Safety and Efficiency) Act 2000* makes provisions relating to the safety, performance, energy efficiency and labelling of products powered by electricity, gas or some other energy source.

Section 7: Electrical Infrastructure

7.1. Electricity Supply

7.1.1. Ensuring safety within the Electricity Supply Industry

Public Safety

Public safety is achieved under the *Electricity Act 1996* through:

- The prescription of safe distances between powerlines and structures or vegetation;
- The prescription of safe working distances in proximity to powerlines, which vary depending on the voltage of the powerlines, the type of activity being performed and the risk assessment being considered by the worker; and
- The prescription of technical safety.

Safe Work Practices

The safety of electrical workers is regulated by the *Work Health and Safety Act 2012*. Accidents are required to be reported in accordance with Regulation 70 of the *Electricity (General) Regulations 2012*.

The *Electricity Act 1996* and the *Electricity (General) Regulations 2012* set out requirements related to the safety of electricity infrastructure, including monitoring through SRMTMPs and also of electrical installations. Safety performance is measured against nationally accepted benchmarks and expressed as:

- Lost Time Injuries – the number of injuries resulting in more than one working day lost
- Medical Treatment Injuries – the number of injuries requiring medical treatment

Electricity entities provide these indicators as part of their annual reporting to the Technical Regulator.

Live Powerline Work Safety

The *Electricity (General) Regulations 2012* prescribe safety procedures and processes to be employed while working on or near live powerlines. A person who wants to perform high voltage live line work must complete an appropriate training course. The content of that course and the training provider must be approved by the Technical Regulator.

Currently, seven training providers have obtained Technical Regulator approval:

- SA Power Networks Skill Enhancement Centre;
- Omaka Training (New Zealand);
- TransGrid;
- SERECT—a subsidiary of Electricité de France (EDF);
- Aeropower Pty Ltd;
- Powerline Training Pty Ltd;
- Enersafe.

Substation Work Safety

Substations are considered high risk areas. Prior to working in a substation, a worker must have the appropriate level of accreditation for access to the required areas and functions in the substations, complete an induction and follow safe access processes including compliance with work permit systems.

7.1.2. Major Generators

In South Australia, the major entities responsible for scheduled generation supply a total installed capacity of 3022 MW. Natural gas is the source of fuel for the majority of the generators.

Table E1: Scheduled Generators with nameplate capacity exceeding 50MW

Power Station	Fuel	Owner	Capacity (MW)
Angaston	Diesel	Lumo Generation SA Pty Ltd	50
Dry Creek GT	Natural Gas Pipeline	Synergen Power Pty Ltd	156
Hallett GT	Natural Gas Pipeline	EnergyAustralia	234.3
Ladbroke Grove	Natural Gas Pipeline	Origin Energy Power Limited	80
Hornsedale Battery	n/a (battery)	Neoen	100
Mintaro GT	Natural Gas Pipeline	Synergen Power Pty Ltd	90
Osborne	Natural Gas Pipeline	Osborne Cogeneration Pty Ltd	180
Pelican Point	Natural Gas Pipeline	Pelican Point Power Limited	529
Port Lincoln GT	Diesel	Synergen Power Pty Ltd	73.5
Port Stanvac 1	Diesel	Lumo Generation SA Pty Ltd	57.6
Quarantine	Natural Gas Pipeline	Origin Energy Power Limited	229
Snuggery	Diesel	Synergen Power Pty Ltd	63
Torrens Island A	Natural Gas Pipeline	AGL Energy	480
Torrens Island B	Natural Gas Pipeline	AGL Energy	800
Total			3022.4

Reference: AEMO: SA existing generation Information (August 2019)

7.1.3. Renewable Generation

South Australia's generation mix includes a high proportion of renewable energy technology. Currently, there are 17 wind generation licenses with a total output capacity of 2051 MW.

The information for the wind farm capacities below are sourced from the AEMO SA existing generation information and the Commission Generation Licenses website.

Table E2: Semi- Scheduled and Non-Scheduled renewable Generation with capacity exceeding 20MW

Power Station	Fuel	Capacity (MW)
Bungala One	Solar	135
Canunda	Wind	46
Cathedral Rocks	Wind	66
Clements Gap	Wind	56.7
Hallett 4 North Brown Hill	Wind	132.3
Hallett 5 The Bluff WF	Wind	52.5
Hallett Stage 1 Brown Hill	Wind	94.5
Hallett Stage 2 Hallett Hill	Wind	71.4
Hornsedale Wind Farm Stage 1	Wind	102.4
Hornsedale Windfarm Stage 2	Wind	102.4

Hornsedale Windfarm Stage 3	Wind	112
Lake Bonney 1 Wind Farm	Wind	80.5
Lake Bonney 2 Wind Farm	Wind	159
Lake Bonney 3 Wind Farm	Wind	39
Mt Millar	Wind	70
Snowtown	Wind	98.7
Snowtown S2	Wind	270
Starfish Hill	Wind	33
Tailem Bend	Solar	108
Waterloo	Wind	130.8
Wattle Point	Wind	90.75
Total		2050.95

Reference: AEMO: SA existing generation Information (August 2019)

7.1.4. Transmission

The electricity transmission system transports power from the power stations directly to a series of substations and switchyards, which in turn supply the distribution system and directly connected transmission customers. The major transmission entity in South Australia, ElectraNet, owns and operates a network of approximately 5,680 circuit kilometres of transmission lines. The network operates at nominal voltages of primarily 275 kV and 132 kV with a smaller number of 66 kV lines as shown in Table E3.

Table E3: ElectraNet transmission network length

Voltage (kV)	Overhead (km)	Underground (km)
275kV	2,613	26
132kV	3,018	0
66kV	21	3

The South Australian electricity transmission network is connected to Victoria through the Heywood and Murraylink interconnectors.

ElectraNet operates 95 substations. Substations included in the transmission network are primarily of outdoor construction and air insulated. The network includes some gas insulated metal clad switchgear. ElectraNet does not own all the assets or land at a number of substations; these sites are shared with other electricity entities, primarily SA Power Networks, the operator of the distribution network.

A system monitoring and switching center for the transmission network is located in Adelaide and includes Supervisory Control and Data Acquisition (SCADA) facilities to monitor system conditions at substations and to control equipment in the network.

The transmission system is the backbone of electricity supply in South Australia and is being maintained at a high level of reliability and availability. A number of thermal generators and wind farms are connected to this transmission network at various locations throughout the state.

Murraylink Transmission Company

The Murraylink Transmission Company Pty Ltd runs an inter-regional transmission service comprising two high voltage direct current cables 176 kilometres in length between Berri in South Australia and Red Cliffs in Victoria. At both ends of the cable is a DC-AC converter station to connect Murraylink to the existing transmission systems in South Australia (at 132 kV) and Victoria (at 220 kV).

Murraylink is a bi-directional facility with a steady state transfer capability of 220 MW at the receiving end. It provides South Australian consumers with access to generation from Victoria and New South Wales at times of local peak loads or generation shortfall. During off-peak periods, Murraylink is able to export excess South Australian generation to Victoria and New South Wales consumers.

7.1.5. Distribution

In South Australia, the entity primarily responsible for electricity distribution is SA Power Networks which serves approximately 879,500 customers. There are a number of smaller distribution entities covering remote areas. Some of these areas were managed by SA Power Networks under contract for the reporting period. At June 2019, the SA Power Networks' distribution system consisted of 89,300 kilometers of overhead lines and underground cables and 408 substations. Some distribution substations are within sites shared with ElectraNet.

Table E4: Distribution network length at June 2019

Operating Voltage	Overhead (km)	Underground (km)
Low Voltage (<1000 Volts)	18,803	13,733
11 kV (includes 7.6 kV)	17,879	4,106
19 kV (SWER)	29,131	61
33 kV	3,990	135
66 kV	1,440	54
132 kV ¹	11	0
Total	71,254	18,089

¹ Licence modified to allow for 132 kV distribution assets

SA Power Networks Key Performance Indicators (KPIs)

SA Power Networks KPIs cover service and technical Standards and include supply interruptions, power surges and low and high voltage complaints. SA Power Networks reports its performance against these KPIs, with reliability and outage indicators on a quarterly basis and all other indicators on an annual basis. The Technical Regulator receives and reviews these reports and follows up on any technical issues, where deemed appropriate, to ensure that corrective action has been taken or is planned. This reporting process ensures that the Technical Regulator is kept informed of major outages and provides assurance that the reliability of electricity supply is being maintained or improved. These KPIs are included in Table K2 in Volume IV of Appendix 1.

7.2. Safety Clearances to Powerlines

The Technical Regulator is responsible for the administration of the provisions of the *Electricity Act 1996* relating to the safe clearance of buildings and structures, workers and equipment, and vegetation from powerlines.

Where there is a dispute relating to either vegetation or building clearances, the Technical Regulator strives to facilitate a sensible, safe and agreeable resolution that complies with the requirements of the legislation.

7.2.1. Vegetation Clearance

The Technical Regulator administers the *Electricity (Principles of Vegetation Clearance) Regulations 2010* which include:

- the required clearance distances and the normal clearance cycle of vegetation;
- the list of species of vegetation which may be planted or nurtured near powerlines;
- providing the occupiers of land an opportunity to lodge an objection in relation to vegetation clearance issues.

Risks associated with Vegetation near Powerlines

The risks directly associated with vegetation contacting powerlines include electric shocks, fire, damage to infrastructure and interruptions of supply. To protect people and property from these risks, clearance zones and buffer zones (which limit the amount of pruning of vegetation) and planting restrictions have been established under the *Electricity (Principles of Vegetation Clearance) Regulations 2010*.

In South Australia, a special case for concern is the risk of bushfires being started by overhead powerlines. This risk is principally managed through vegetation clearance, keeping flammable material well away from powerlines.

Vegetation Clearance Objections

Electrical entities conduct a periodic vegetation inspection at intervals of no longer than three years. In bushfire risk areas, annual inspections are conducted prior to the bushfire season. When an electricity entity identifies vegetation on private property as requiring trimming or removal, the entity is required to provide the owner or occupier with a 30-day notice of intention to enter the property to cut vegetation. The owner or occupier then has 21 days after receiving the notice to lodge a written notice of objection with the Technical Regulator. The Technical Regulator holds regular meetings with SA Power Networks and Active Tree Services' management throughout the year, to discuss any disputes or other matters regarding vegetation near powerlines, which had come to the attention of the Technical Regulator.

Vegetation Clearance Agreements

The *Electricity Act 1996* makes provision for electricity transmission and distribution entities and Councils to enter into agreed vegetation clearance schemes under which vegetation clearance responsibilities may be conferred on a Council. A Council also may agree to pay for the cost of more frequent clearance in order to reduce the scale of a three-yearly pruning by the entity. There are currently no such agreements in place between any Council and SA Power Networks.

7.2.2. Building and Working Clearances

The *Electricity (General) Regulations 2012*, under the *Electricity Act 1996* define the minimum clearances between buildings or structures and powerlines. Section 86 of the *Electricity Act 1996* also gives the Technical Regulator power to grant an approval (subject to limitations as specified in the *Electricity (General) Regulations 2012*) for a building or structure to be erected within the prescribed clearance distances.

Risks associated with Buildings near Powerlines

Minimum building clearances are defined in the legislation to prevent electric shocks, damage to infrastructure or property, and to ensure the reliability of supply.

The Technical Regulator actively promotes awareness of these legislated distances within the construction industry by providing verbal and written advice and presentations, undertaking site assessments, and distributing information via brochures and the internet.

The *Electricity Act 1996* makes provisions for an electricity entity to rectify identified breaches of minimum safety clearances and recover the costs by means of a court order.

Section 8: Electrical Installations

8.1. Regulatory Framework

The safety of electrical installations is mandated by the *Electricity Act 1996* and the *Electricity (General) Regulations 2012*. This legislation defines the powers, rights and responsibilities of the various parties in relation to the safety of electrical installations. The *Electricity (General) Regulations 2012* mandate compliance with *AS/NZS 3000 – Wiring Rules* as well as the technical installation rules of the network operator.

Key issues covered by the *Electricity Act 1996* and the *Electricity (General) Regulations 2012* include placing the responsibility for the safety of an electrical installation with the owner or operator of that installation, and the reliance of a certificate of compliance as a means of demonstrating that this responsibility has been met. Likewise, the person connecting the installation to the network (typically the network operator) can rely on the certificate to demonstrate they have met their obligation regarding the safety and compliance of the installation.

Occasionally installations and appliances are deliberately misused by unlicensed persons involved in illegal activities, for example in the manufacture of illegal drugs.

8.2. Compliance Audits

These audits may be random or targeted. Targets for random audits are obtained from data such as lists of new connections and alterations such as solar installations supplied by network operators. Targeted audits are performed following complaints, concerns from past performance or intelligence gathered from the industry.

The Technical Regulator inspects electrical installations against requirements specified in AS/NZS 3002 for outdoor events due to their temporary nature, and the high levels of potential risk involved.



Figure E1: Non-compliant electrical installation at a major event. The circled cable is too low, has no secondary support and is not flagged

Other specialist areas that are audited include recreational vehicles, caravan parks, boats and marinas, hazardous areas and patient areas.

8.3. Electrical Helpline

Electrical workers and contractors are encouraged to call the Technical Regulator for assistance with technical compliance matters. This proactive strategy helps the industry achieve compliance in a timely manner. The helpline is available 8am-4.30pm Monday to Friday.

8.4. Enforcement

The Technical Regulator has a range of enforcement options to deal with non-compliant electrical installation work and other breaches of the *Electricity Act 1996*.

8.4.1. Directives to make installation safe

An authorised officer can give a direction to make an electrical installation safe. This direction can be given to the owner or operator of the installation or to the person who performed the work. In some cases this may also include disconnection of the installation until it is repaired and made safe to the satisfaction of the authorised officer.

8.4.2. Formal warnings

A formal warning can be given to the person responsible for breaching the *Electricity Act 1996*. If this is done verbally it is also confirmed in writing. Formal warnings provide a basis for additional enforcement activity should there be an escalation of the offence, in addition to establishing patterns of repeated non-compliance.

8.4.3. Expiations

Expiation notices are issued for more serious breaches of the *Electricity Act 1996*. They are an administrative penalty that is intended to minimise the impacts on the courts and legal system caused by relatively minor offences. The issue of an expiation does not register a conviction against the alleged offender, and paying the expiation is not considered to be an admission of guilt. Expiations can be challenged in court by the alleged offender, who then faces the potential of a significantly higher penalty if found guilty.

8.4.4. Prosecution

The Technical Regulator may prosecute a person where the non-compliance is so serious as to constitute gross negligence or where the offender has a history of significant non-compliances.

The court will then decide the actual penalty up to the maximum stated in the *Electricity Act 1996* should the person be found guilty.

8.4.5. Suspension/cancellation of licenses

In cases of serious or consistent non-compliance, the Technical Regulator may refer a case to the Commissioner for Consumer Affairs who is responsible for occupational licensing under the *Plumbers, Gasfitters and Electricians Act 1995* for action. This may result in the suspension or cancellation of a contractor's licence or worker's registration, or the imposition of conditions to that licence/registration.

Instances of electrical work performed by non-licensed/registered persons are also forwarded to the Commissioner.

8.5. Reporting of Electric Shocks

All incidents that result in electric shocks or burns must be reported to the Technical Regulator. In the case of death, this must be done immediately. If a person requires medical treatment it must be reported within one working day. All other instances must be reported within 10 working days.

This allows an appropriate time for the incident to be investigated. The Technical Regulator investigates electrical fatalities, usually in conjunction with SAPOL. Other investigations are normally performed by registered electrical workers. Incident reports help prevent recurrences of the event and may result in

enforcement action being taken. Statistical data from shock and incident reports also assist with resource allocation and scope for potential changes to electrical Standards.

Section 9: Electrical Products

The *Energy Products (Safety & Efficiency) Act 2000* is administered by the Technical Regulator and requires that proclaimed classes of electrical products must comply with specified safety and performance Standards and be labelled to show compliance before sale (see Appendix 5).

Other Australasian jurisdictions have similar legislation. The Technical Regulator works with other Australasian Regulators and Standards Committees to ensure a nationally consistent electrical product safety regulatory regime.

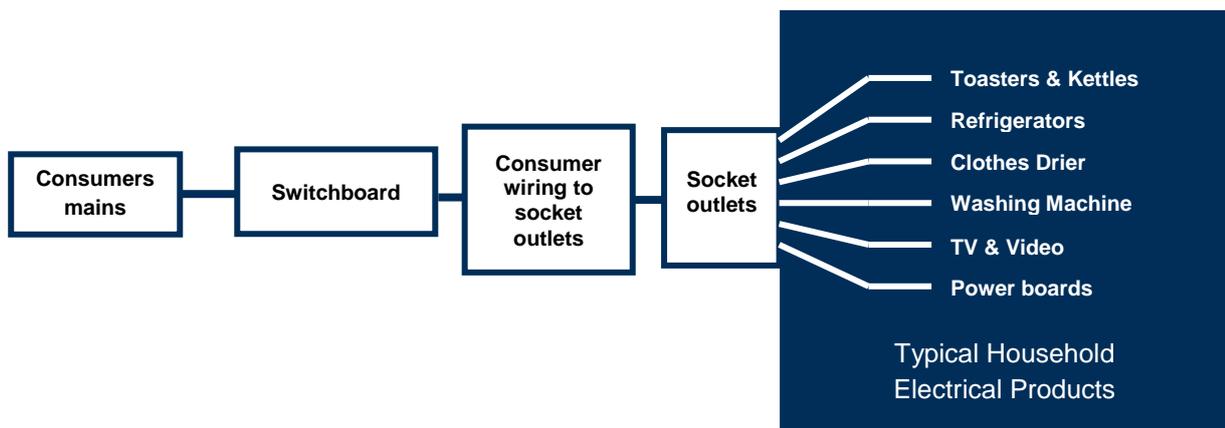


Figure E2: Boundary of installations from products

An electrical product is any device that needs to be connected to the household electricity supply. This includes such items as white goods, power tools, portable household products, power boards, air conditioners and hot water services. It is estimated that the typical household has up to 50 electrical products.

The Technical Regulator investigates reports of breaches of the *Energy Products (Safety & Efficiency) Act 2000*. This can result in the issue of stop sale notices, public warning statements, product recalls, expiration notices or prosecution.

9.1. Role of the Technical Regulator

The Technical Regulator, in accordance with the *Energy Products (Safety & Efficiency) Act 2000* grants electrical products safety labelling certificates and electrical product suitability certificates to applicants. The certificates are required to label electrical products to indicate their compliance with applicable Standards or certify their suitability to connect to an electricity transmission or distribution network before sale. The Technical Regulator also follows up these products after sale, through field audits and product investigations, based on reported failures.

The Technical Regulator is represented on national regulatory and Standards committees, the aim of which is to ensure that regulators act in a coordinated manner throughout Australia and that the safety Standards impose a common, acceptable level of safety. These committees are listed in Section 10.2.

The Technical Regulator also provides technical advice to manufacturers and importers, the electrical industry, government agencies and emergency services.

The Technical Regulator also has power under the *Energy Products (Safety and Efficiency) Act 2000* to prohibit the sale or use of unsafe energy products (including recall or repair) and issue public warning statements about unsafe energy products.

9.2. Product Safety

9.2.1. Product Approval

There are 59 classes of products proclaimed under the *Energy Products (Safety & Efficiency) Act 2000*, which must comply with specified safety and performance Standards. This list has evolved over time, and typically includes the household products that, in the past, have been involved in numerous fires and/or electric shock incidents and therefore represent a 'high risk' category. These products, which are covered by similar legislation in all Australian States, require pre-market approval and must carry an approval label to indicate their compliance with safety and performance Standards before they can be sold. Appendix 5 lists these proclaimed products.

9.2.2. Product Approval Safety Process

In South Australia, the current approvals process requires manufacturers or importers to submit samples of proclaimed products for testing at accredited laboratories to ensure their compliance with the applicable Australian/New Zealand safety and technical Standards. These Standards set down the basic requirements that the products must meet to be considered electrically safe. Typically, these requirements include levels of protection to guard against such things as unsafe construction, access to live parts, overheating from normal or abnormal operation and fire propagation.

Testing must be carried out in accordance with the relevant Standards by appropriate test laboratory facilities in Australia or overseas. In Australia, this means a testing facility that has National Association of Testing Authorities (NATA) accreditation. Evidence of compliance can then be submitted to the Technical Regulator or a private certifier, who will verify compliance and then issue a certificate. This certificate is generally valid for five years. When offered for sale, the product must carry the allocated approval marking. If issued by a state regulator or private certifier, the marking contains a letter identifying the state or certifier who approved it, followed by its allocated number (e.g. Victoria – ESVxxxxx, South Australia – S/xxx or OTRxxxxxx), private certifier marking (alpha numeral), or if AS/NZS 4417 (marking of electrical products to indicate compliance with regulations) is complied with, the Regulatory Compliance Mark (RCM) symbol as defined in that Standard as shown in Figure E3.



Figure E3: Regulatory Compliance Mark



Figure E4: Example of approval labelling for an OTR (S marking) approved product – wall switch



Figure E5: Example of the RCM approval labelling symbol for an approved product – desk lamp



Figure E6: Example of approval labelling for regulatory authority NSW Fair Trading – laptop power supply

Each state in Australia recognises approvals issued by the other state authorities and product certifiers. There are also alternative private certifying bodies which have been recognised interstate, resulting in approval labelling other than that issued by a State Regulator, with a consequent reduction in the number

of products being approved by state authorities. The nature of the retail products industry is such that competitors quickly identify any unapproved items on sale and report them to the Technical Regulator, who is able to take immediate action for breaches of the *Energy Products (Safety & Efficiency) Act 2000*.

9.2.3. Risks due to faulty or misused Products

The risks associated with electrical products that have failed because of their design, or manufacture, or misuse by the consumer include:

- personal injury (shocks);
- electrocution (fatalities);
- property damage (fires).

Manufacturers, importers and retailers also assume liability through the sale of electrical products for:

- costs of recalls, replacement or repair of products;
- costs of compensation claims;
- loss of, or damage to, the organisation's reputation.

Hazardous Products

Typical hazards found in faulty electrical products include:

- a breakdown of insulation due to overheating or mechanical damage, which may expose the consumer to the risk of electrical shock;
- overheating of the product, which may result in fire or ignition of its surroundings, exposing consumers to the risk of injury or property damage;
- mechanical failure, which may cause personal injury to the user.



Figure E7: Example of an electrical product failure. This photo illustrates the consequences of a faulty electrical connection in a washing machine that overheated and caught fire



Figure E8: Example of an electrical product failure. This photo illustrates the consequences of a bathroom heater glass diffuser shattering whilst in use, resulting in the user receiving burns and cuts

Consumer Misuse

Products may also fail because of misuse by the consumer. Typical examples of this are:

- incorrect securing of electric blankets resulting in folds that lead to overheating and fire;
- unsafe placement of radiators and fan heaters adjacent to furniture and materials, resulting in fires;
- continued use of electrical products with damaged bodies and cords, resulting in electrical shocks;
- not having products checked after being subjected to an impact or falling from a height.

The figure below shows an example of brand new decorative LED rope lights that started to emit smoke and deform within minutes of use, as a result of the user not observing the warning instructions to remove the packaging.



Figure E9: Incident due to user not observing the warning instructions

In many cases, products are either incorrectly installed or operated by consumers who do not follow the manufacturer's recommendations and instructions. The Technical Regulator alerts consumers and electricians to such risks through public warnings, the continuous development of information brochures, Regulation Roundup and education programs.

9.2.4. Product Failures and Corrective Actions

The Technical Regulator monitors the failures of electrical products. If necessary, action can be taken under the *Energy Products (Safety & Efficiency) Act 2000* to remove any hazardous products from the market place. Depending on the severity of the failure, there are a number of options available to the Technical Regulator when assessing what action should be taken for specific situations including:

- Issuing an Incident Report – when the failure of a product has not directly resulted in a safety hazard. The report is circulated to all regulatory authorities throughout Australia and New Zealand for information and monitoring;
- Issuing a Hazard Alert – when the failure of a product has resulted in an immediate safety problem such as a reported electric shock. The notice is immediately circulated to all regulatory authorities including both state and federal consumer affairs authorities for information, and followed up by action with the trader as considered necessary;
- Issuing a Stop Sale – generally issued in conjunction with a Hazard Alert. The notice is circulated to all regulatory authorities including both state and federal consumer affairs authorities for information and is followed up by action with the trader;
- Issuing a Recall – when a product already on the market has been identified as a safety hazard. This may warrant the issuance of a recall notice and result in a national public product recall conducted in accordance with ACCC guidelines.

9.2.5. Stop Sales

The Technical Regulator can issue stop sale notices to traders in South Australia as the situation warrants. An example of a situation requiring the seller to “Stop Sale” is when the product is proclaimed under the *Energy Products (Safety & Efficiency) Act 2000*, but is not marked with any approval labelling indicating that it is formally approved for electrical safety.

9.2.6. Mutual Recognition

Under a Mutual Recognition Agreement (MRA) between two or more jurisdictions, one jurisdiction is able to recognise a product approval by another.

Apart from the ‘corresponding laws’ recognised under the *Energy Products (Safety & Efficiency) Act 2000*, several mutual recognition schemes affect the Technical Regulator’s operations and those of other State Regulators.

Australian Mutual Recognition

The *Mutual Recognition (South Australia) Act 1993* and the *Mutual Recognition Act 1992* (Commonwealth) provide that, in principle, a product made in or imported into a state that can be lawfully sold in that state, may be lawfully sold in any other state. A label is required showing the place of manufacture or importation to enable a defence of mutual recognition to be established.

Trans-Tasman Mutual Recognition Arrangement (TTMRA)

The *Trans-Tasman Mutual Recognition (South Australia) Act 1999* and the *Trans-Tasman Mutual Recognition Act 1997* (Commonwealth) provide that, in principle, products made in or imported into New Zealand that may be lawfully sold in New Zealand, may also be lawfully sold in Australia. A label on the product is required showing the place of manufacture or importation to enable a defence of mutual recognition to be established.

The TTMRA has resulted in some products either manufactured in or imported into New Zealand being offered for sale in Australia without any identifiable approval marking as New Zealand law does not require such labelling.

European Economic Union Mutual Recognition Arrangement (EUMRA)

There is a mutual recognition agreement between Australia and the European Economic Union stating that a product that has been tested in a recognised laboratory with mutual accreditation in one jurisdiction will be accepted as having been tested in a recognised laboratory with mutual accreditation in the other jurisdiction.

Singapore Mutual Recognition Arrangement

The Singapore MRA, signed in 2001, is based on conformity assessment by relevant government bodies in the two countries. Essentially, the importing country accepts the assessment of product conformity to its requirements undertaken by conformity assessment bodies in the exporting country.

9.3. Product Energy Efficiency

Energy Labelling and Minimum Energy Performance Standards (MEPS) registrations are now regulated by the Australian Government’s *Greenhouse and Energy Minimum Standards Act 2012* (GEMS legislation). The energy efficiency requirements of the *Energy Products (Safety & Efficiency) Act 2000* are still applicable but in general terms have become redundant.

9.4. Industry Communication

There are about 140 South Australian businesses (including manufacturers, importers and retailers) that submit electrical products to the Technical Regulator for approval. The Technical Regulator distributes newsletters and circulars to these businesses to keep them informed of changes to the *Energy Products (Safety & Efficiency) Act 2000* and Australian Standards as necessary.

Section 10: Electricity Regulatory Coordination

10.1. Electrical Regulatory Authorities Council (ERAC)

National uniformity and consistency are extremely important to electricity utility operators, manufacturers, electrical workers, contractors and consumers. ERAC has representatives from all Australian States and Territories and New Zealand. It formally meets twice per year to address regulatory matters related to key technical and worker licensing issues facing the electrical industry and to develop national strategies to address these issues consistently.

Meetings are divided into five sessions, each with their own chairperson, covering general matters, electrical installations and inspection, electrical equipment safety, electrical licensing and electricity supply (network infrastructure).

The South Australian Technical Regulator is presently chairing the electrical installations and inspection session. There has been a focus placed on the regulation of new technologies such as solar panel installations. More recently there has also been work associated with the further development of the solar PV inverter Standard and the development of a new Standard addressing battery storage devices.

ERAC works closely with Standards Australia to maintain and develop national Standards which in turn become state-based requirements when they are called up by legislation. The Technical Regulator, as a member of ERAC, actively participates in Standards development issues arising from ERAC meetings. The Technical Regulator also participates in a number of ERAC working groups to ensure that national developments take account of South Australian issues.

Uniform Standards are beneficial in that they provide for the movement of workers between regions and enable the development of Standards based on the experience of a wider group. The national Standards development process also supports the ongoing review and improvement of safety Standards in a transparent manner. ERAC has been active in setting the agenda for the progressive review and implementation of network safety Standards. This has included a Standard dedicated to safety issues associated with “smart” meters.

ERAC has been particularly keen to support the timely development of Standards which deal with matters that have a direct impact on the interface between the network industry and the general public, such as powerline clearances.

Following its review of the regime for regulating electrical equipment safety in Australia, ERAC has recommended an updated system aimed at eliminating shock, injury and property damage resulting from the sale, supply and use of unsafe electrical equipment. ERAC has proposed that the new system should be underpinned by nationally consistent performance-based legislation in each jurisdiction and comprehensive scheme rules. It contains a mixture of pre-market registration based on third party safety assessment and post-market enforcement.

The system will be designed to take into account the changing character of the electrical appliance supply industry in Australia. The recommendations formed the basis of the Regulatory Impact Statement (RIS), released for public comment by ERAC. Following consideration of public submissions on the RIS and further industry consultation, a final RIS was endorsed by ERAC members. In order that a national scheme is agreed and implemented, ERAC is in the process of developing an intergovernmental agreement (IGA) between all states and territories to gain Ministerial agreement to progress the scheme.

The Ministerial Council on Energy (MCE) has established the Energy Technical and Safety Leaders Group (Leaders Group). The Leaders Group was tasked with the development of a plan to achieve further harmonisation of state and territory safety regulation for the electricity and gas supply industry.

The plan presented by the Leaders Group contains recommendations for achieving a harmonised national framework within which state and territory energy supply industry safety and technical regulations could operate. The plan proposes an IGA as the central mechanism by which jurisdictions would commit to a series of overarching principles and objectives supporting harmonisation. The MCE has given in principle agreement to the recommendations contained in the plan as they apply to MCE Ministers' portfolio responsibilities. MCE Ministers also agreed to work with related portfolio Ministers within their jurisdiction to progress the proposed IGA. The objective of the IGA is to create a nationally harmonised energy supply industry safety framework, to ensure enhanced public and industry safety, enhance worker mobility and contribute to the efficient delivery of energy network services. In particular, the IGA will formalise governments' commitment to make necessary legislative or other changes to support the nationally harmonised safety framework for the energy supply industry. The IGA does not commit to the development of a model or applied legislation.

As part of the harmonised safety framework, the IGA commits participating jurisdictions to an ongoing work program in Standards development (such as the Australian Standard for Energy Network Safety Systems), operating safety rules and skills and training. This work would be supported by the Energy Supply Industry Safety Committee (ESISC), a non-statutory advisory body that provides advice, knowledge and expertise to the MCE and its Senior Committee of Officials (SCO) on the development and implementation of the nationally harmonised safety framework. In 2012, the Commonwealth, states and territories endorsed the IGA on Energy Supply Industry Safety by the signature of First Ministers. Under the IGA, Commonwealth, state and territory governments agree to put in place a nationally harmonised safety framework for the energy supply industry. The Terms of Reference (TOR) for the ESISC came into effect with the signing of the IGA. The TOR tasked ESISC to develop and implement a nationally harmonised safety framework for the energy supply industry.

The TOR requires that ESISC submit to the MCE's Senior Committee of Officials (SCO) for approval of the ESISC implementation plan for five years. This plan requires a progress update every 12 months on:

- Energy Network Safety Systems;
- Consistency with National Occupational Health and Safety;
- Consistency with National Occupational Licensing System initiatives;
- Legislative and regulatory issues;
- Expanded National Refresher Training Recognition Protocol for the Electricity Supply Industry;
- Generation harmonisation;
- Harmonised Operating Safety Rules.

A key outcome of this work was the development and publication on 18 April 2013 of the Australian Standard AS 5577:2013 Electricity Networks Safety Management Systems.

The new Standard provides a national framework for the harmonisation of energy network safety systems.

10.2. Committee Representation

The Technical Regulator provides expert technical input for the revision of key Australian Standards through representation on the following Standards committees:

<i>EL-001</i>	<i>Wiring Rules</i>
<i>EL-001-09</i>	<i>Wiring Rules Drafting Subcommittee</i>
<i>EL-001-17</i>	<i>Construction and Demolition Sites Installations</i>
<i>EL-001-21</i>	<i>Testing and Inspection of Electrical Installations</i>
<i>EL-001-24</i>	<i>Generating Sets</i>

<i>EL-002</i>	<i>Safety of Household and Similar Electrical Appliances and Small Power Transformers and Power Supplies</i>
<i>EL-004</i>	<i>Electrical Accessories</i>
<i>EL-042</i>	<i>Renewable Energy Power Supply Systems & Equipment</i>
<i>EL-042-03</i>	<i>Grid Connected Systems and Equipment</i>
<i>EL-042-05</i>	<i>Safety of battery systems for use in inverter energy systems</i>
<i>EL-044</i>	<i>Safe Working on Low-Voltage Electrical Installations</i>
<i>EL-052</i>	<i>Electrical Energy Networks, Construction and Operation</i>
<i>ET-007</i>	<i>Coordinating Committee on Power and Telecommunications (CCPT)</i>
<i>QR-012</i>	<i>Conformance Marking to Regulatory Requirements</i>

Volume II - Gas Industry

Preface

This volume covers the Technical Regulator's operations under the *Gas Act 1997*.

Gas Act 1997

Section 3 of the *Gas Act 1997* states that:

"The objects of this Act are—

- (a) to promote efficiency and competition in the gas supply industry; and
- (b) to promote the establishment and maintenance of a safe and efficient system of gas distribution and supply; and
- (c) to establish and enforce proper standards of safety, reliability and quality in the gas supply industry; and
- (d) to establish and enforce proper safety and technical standards for gas installations and appliances; and
- (e) to protect the interests of consumers of gas."

The Technical Regulator is established by section 7 of the *Gas Act 1997*.

Section 8 of the *Gas Act 1997* states that:

"The Technical Regulator has the following functions:

- (b) the monitoring and regulation of safety and technical standards in the gas supply industry; and
- (c) the monitoring and regulation of safety and technical standards with respect to gas installations; and
- (da) the provision of advice in relation to safety or technical standards in the gas supply industry to the Commission at the Commission's request; and
- (e) any other functions assigned to the Technical Regulator under this Act."

The Technical Regulator advises the Minister for Energy on gas emergency management and related issues. In addition, the Technical Regulator provides expert input and is involved in a range of activities in liaison with the gas industry and other Government agencies. The Technical Regulator's operations in relation to these functions are dealt with in various sections of this report.

Energy Products (Safety and Efficiency) Act 2000

The *Energy Products (Safety and Efficiency) Act 2000* makes provisions relating to safety, performance, energy efficiency and energy labelling of products powered by electricity, gas or other energy sources.

Section 11: Gas Infrastructure

11.1. Overview of the Natural Gas Industry in SA

Typically, commercial and residential consumers use natural gas for cooking, space and water heating. Industrial use includes processes such as cement and glass manufacturing and steel production.

South Australia receives gas from Moomba (SA) through the Moomba to Adelaide pipeline (MAP), South West Queensland via the QSN Link Pipeline (Ballera) and Victoria via Port Campbell to Adelaide pipeline (PCA pipeline). The South East Pipeline System (SEPS) delivers gas from the PCA pipeline to the Ladbroke Grove/Katnook pressure reduction station for distribution to the Limestone Coast region in SE South Australia. The MAP is operated by Epic Energy South Australia (EESA) and the PCA pipeline is operated by SEA Gas. A joint venture project between EESA and SEA Gas resulted in the interconnection of the two pipelines and was completed in June 2015. This interconnection is located at the Pelican Point Power Station and allows gas to travel mainly from the PCA pipeline to the MAP. This interconnection provides a higher security of supply to the network and power generators in South Australia. There has generally been a concern regarding single source of supply to both to both Port Pirie and Wasleys laterals in the north, however, following this project both of these laterals can now be feed via the MAP pipeline from gas supplied via the PCA pipeline.



Figure G1: Southern and eastern Australian gas fields and major pipelines

11.2. SA Natural Gas Supply

The role of the Technical Regulator with respect to the gas supply is to monitor the quantity and quality of the gas being supplied into the distribution network and onto the consumers. Should there be a gas supply emergency; the Technical Regulator will act within the provisions of the legislation to ensure that the impacts upon the South Australian community is minimised.

The gas is transported from the source through transmission pipelines and these in turn transfer the gas into the distribution networks at custody transfer metering stations, often referred to as 'City Gate Stations'. Here the gas is metered, the pressure reduced and made ready for transportation through the distribution network to houses and industry.

AGN is the owner of and is licensed to operate the natural gas distribution networks in South Australia. AGN has contracted the APA Group to operate these networks on its behalf. Gas from the distribution system is then supplied to consumers in accordance with their contract with their retailer. In addition, AGN also owns several small gas systems, typically referred to as 'farmtaps'. The farmtaps supply gas to typically a single industrial/commercial consumer that is fed directly from the transmission pipeline.

11.3. Safety of Natural Gas Infrastructure

AGN's gas distribution licence explicitly requires it to include a detailed Leakage Management Plan (LMP), an Asset Management Plan (AMP) and a Distribution Mains and Services Integrity Plan (DMSIP) in its SRMTMP. The Technical Regulator provides advice to the Commission on an annual basis in relation to their acceptance based on requirements prescribed by legislation, the Commission's Gas Distribution Code and Gas Metering Code and AGN's distribution licence conditions.

11.3.1. Compliance with SRMTMP

The Technical Regulator uses the following techniques to monitor compliance with AGN's SRMTMP:

- auditing AGN's and the APA Group's compliance with specific sections of the plan directly affecting consumers, the general public, and/or the safety, reliability, and integrity of the distribution network;
- reviewing the results of any independent technical auditor engaged by AGN;
- reviewing the results of internal auditing processes used by the APA Group;
- reviewing the prescribed set of KPIs reported to the Technical Regulator by AGN;
- regular technical meetings and discussions with AGN and the APA Group.

11.3.2. Gas measurement management plan (GMMP)

A GMMP is required as a condition of a distribution network licence. Detailed requirements are set out in the Gas Metering Code issued by the Commission. It forms an integral part of managing the risks associated with the installation and maintenance of gas meters to an acceptable level.

11.3.3. Gas incidents

Gas incidents that involve death, or injury to a person requiring medical assistance, property damage above \$5,000 or a dangerous situation involving a pipeline operating above 1,050 kPa, must be reported to the Technical Regulator. The APA Group and the Technical Regulator liaise frequently with the MFS and representatives of other emergency services about appropriate actions that should be taken when responding to gas incidents.

11.3.4. Third party damage

Damage to the distribution systems (mains and services) caused by third party activities constitutes one of the greatest gas related risks to the South Australian community because it can result in gas escapes of large volume. AGN reports the number of these incidents annually to the Technical Regulator as one of its KPIs. A major factor contributing to the damage of mains and services is a lack of notification from a third party to the gas distributor prior to any activity in the vicinity of the mains and services. In South Australia, the APA Group utilises the "Dial Before You Dig" (DBYD) service to minimise the likelihood of damage. This service allows the APA Group to advise about the location of gas pipes and to assess the associated risks of the activities proposed by third parties.

The Technical Regulator monitors the effectiveness of this service via frequent discussions with the APA Group, annual audits and the review of the APA Group's annual operational reports. These discussions assist to assess whether the DBYD system provides an adequate, detailed and prompt asset information and field checking service.

The Technical Regulator addresses and resolves, with the APA Group's assistance, numerous technical enquiries and concerns which are directly made to the Technical Regulator by third parties involved in various works in the vicinity of AGN's distribution infrastructure.

The APA Group promotes a 'Gas Main Awareness Program' to reduce the number of gas incidents caused by third parties. It conducts training sessions and carries out other means of communications (e.g. meetings, letters, emails, etc.) to familiarise metropolitan and regional Councils, major civil works contractors, other utilities (e.g. SA Water, SA Power Networks and Telstra) and emergency services with the existence and identification of AGN's distribution infrastructure. The Technical Regulator strongly supports and monitors these APA Group activities.

11.3.5. Gas leak public reports

The identification, location and repair of leaks are the key to the safe operation of the distribution network. The public's safety is a principal priority for the Technical Regulator, distribution system owners and operators. Should a pipeline fail, it could result in a leak that migrates through the ground to a confined space (e.g. a cellar) and thus would pose a major risk of fire or explosion. Any gas escapes that are found in the distribution system would have been detected through either public reporting (reactive) or regular leakage surveys (proactive). The ongoing mains renewal and mains and services repair strategy of AGN is expected to improve the condition and reliability of the gas distribution network. Over time it is expected that this should further reduce the number of gas escapes reported. The Technical Regulator continues to monitor the gas leak data, especially in relation to the mains replacement strategy.

11.3.6. Leakage surveys

Leakage surveys are the key proactive maintenance strategy employed by the distribution system operator to manage leakage and determine the condition and reliability of the gas distribution network. The approach to leakage surveys is currently risk-based and 'high consequence' locations are surveyed more frequently. The APA Group reports the results of the leakage surveys to the Technical Regulator annually as one of its KPIs.



Figure G2: The APA Group emergency/gas leak reporting number (1800 GAS LEAK – 1800 427 532)

11.3.7. Unaccounted for gas (UAFG) and Distribution Mains and Services Integrity Plan

UAFG is the difference between the measured quantity of gas entering and leaving the distribution network and is thought to be largely due to leakage. Levels of UAFG above industry norms can sometimes relate to the general condition, of a distribution network, or issue related to measurement factors. In old networks, the majority of UAFG is often associated with leaking of CI and UPS mains. The Technical Regulator monitors AGN's compliance with the UAFG and DMSIP requirements as prescribed in AGN's gas distribution licence and the Gas Distribution Code. APA is undertaking HDPE mains replacement which is expected to reduce levels of UAFG over time.

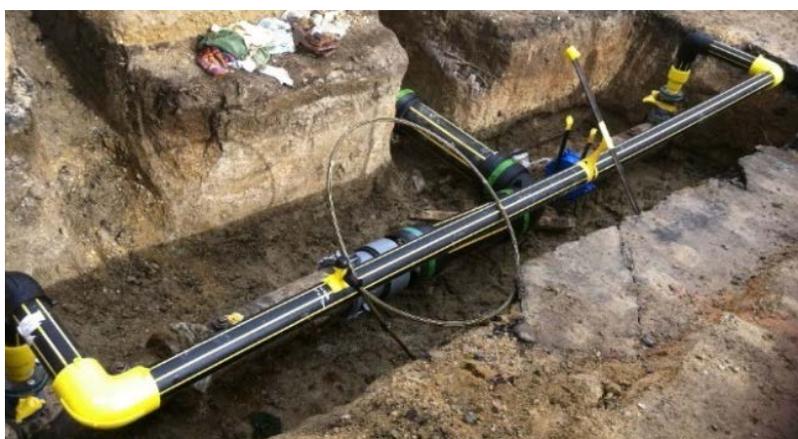


Figure G3: HDPE mains replacement

11.4. Safety of LP gas Distribution Networks

Distributors and retailers of reticulated LP gas in South Australia are required to have the licence or licences relevant to their operations granted by the Commission. These licences are subject to several conditions to ensure that the safety and technical requirements of the *Gas Act 1997* and the Regulations apply. Network owners operate their LP gas distribution networks under a SRMTMP approved by the Commission on the recommendation of the Technical Regulator. The Technical Regulator monitors technical compliance to ensure that the construction, commissioning and operations of the LP gas distribution networks are undertaken according to the appropriate Standards and gas industry practices.



Figure G4: LP gas storage tank compound

As is the case with natural gas distribution, LP gas incident reports are registered in the 'Technical Regulator Incident Database' and reviewed by the Technical Regulator. Where found to be appropriate, the reported incidents will be investigated.

Table G1: LP gas distribution networks in South Australia

Network Location	Owner/ Operator	Length of Main (m)	Operating Pressure (kPa)	Number of consumers
Roxby Downs	Origin	31,381	120	1,536
Victor Harbor (Rosetta Retirement Village)	Origin	5,474	110	417
Renmark (Jane Eliza Estate)	Origin	2,736	115	96
Port Lincoln	Origin	4,075	105	158
Wallaroo	Origin	6,355	105	159
Cape Jaffa Anchorage	Origin	3,600	70	21
Clare (Hanlins Rise Estate)	Elgas Ltd	1,900	140	65
Mount Barker (several locations)	ELS	≈ 22,117	100 - 120	≈ 847

11.5. Gas Retailers' Safety Awareness Plans (SAP)

As of 1 February 2013, following the changes that were made to the National Energy Retail Law (South Australia) (NERL), a gas retailer must prepare, maintain, publish on its website and periodically revise a SAP in accordance with the requirements of Regulation 36A of the NERL. The requirements prescribe that the SAP must include details of the retailers' consumer communication plan, including topics ranging from general gas safety information, to the gas appliance safety approvals scheme, and whom to contact in the event of a gas supply outage. The gas retailer must obtain the approval of the Technical Regulator for the SAP and any revision thereof.

Section 12: Gas Installations

12.1. Natural Gas and LP gas Installations

Gas installation commences downstream of the infrastructure (billing gas meter or LP gas first stage regulator) connected to LP gas cylinders owned by the gas entities. The condition and safe use of the installation is the responsibility of the owner/operator of the installation. The gas installation generally includes appliances, pipe work, flueing, ventilation and controls.

12.1.1. Responsibilities

The Technical Regulator is responsible, under the *Gas Act 1997*, for the monitoring and regulation of safety and technical Standards with respect to gas installations in South Australia. This involves ensuring that installation work is performed in a safe manner, using appropriate methods and materials that are compliant with relevant Standards. The monitoring and regulating of gas installation work is carried out by officers authorised under the *Gas Act 1997*.

The Regulations call up the Australian Standard AS/NZ 5601 – Gas Installations including any Standard called up by or under AS/NZ 5601. The Regulations require that a certificate of compliance must be issued by the gas fitting contractor to the client within 30 days of the completion of all installation work. The *Energy Products (Safety and Efficiency) Act 2000* requires that certain proclaimed gas appliances must be labelled as evidence that they are approved to appropriate Standards by a recognised certification body or the Technical Regulator.

12.1.2. Residential and Light Commercial Gas Installations

Generally, gas installation work involves the connection of new gas appliances. Every year, a significant amount of new domestic and light commercial gas appliances are sold and installed in South Australia, including multiple appliances installed in new premises as well as single additional and replacement appliances in existing premises. In addition to the installation of new gas appliances a significant amount of work involves the repair, replacement and extension of existing gas installation pipe work and components such as flues and ventilation equipment.

An important number of new residential, including industrial/commercial natural gas connections are made every year to the AGN distribution system. New LP gas connections (by various LP gas suppliers) are also made to residential and light commercial premises.

In larger new residential developments where natural gas is not available, it is becoming increasingly popular to supply LP gas by means of reticulated LP gas systems supplied from large storage tanks located on the perimeter of the estate. This has some safety advantages as it removes the need for individual LP gas cylinders at each home to be replaced when empty or having individual tanks refilled by tankers.

12.1.3. Industrial and Large Commercial Gas Installations

The Technical Regulator provides oversight on several significant industrial and commercial gas installations and its involvement often extends over months or even years on some larger jobs and often requires multiple site visits.

The Technical Regulator also provides advice on the interpretation of gas Standards to hydraulic consultants, architects and builders as well as to gas contractors. This represents a significant proportion of the work done by the gas installation and appliance section. Most advice of this type involves commercial or industrial premises and site visits are required to verify that the advice given is consistent with the actual site conditions. This service, whilst resource intensive, is very important and effective. It is far better to identify and resolve installation issues proactively in advance than to reactively deal with non-compliances and potentially unsafe situations in areas where they may create a hazard or delay building handover.

The Technical Regulator monitors complex gas installations particularly where type B appliances are involved. Contractors must provide submissions to authorised type B certifiers to initiate the certification process prior to commissioning, inspection/testing and commercial operation. Installers are also required to provide submission plans to the Technical Regulator for elevated pressure installations in order to get gas on to the property or where existing installation pressures are upgraded.



Figure G5: New Air Dryer (type B appliance) undergoing commissioning and type B testing



Figure G6: Preowned resin sand dryer (type B appliance) undergoing modifications and installation

12.1.4. Compliance Audits

Proactive Audits

The current strategy, where possible, is to proactively audit samples of the gas installation work from each contractor in South Australia annually. Gas contractors performing LP gas work in the more remote regional areas may be audited less often because of logistical and resource constraints.

The Technical Regulator uses a standard audit pro-forma to record audit results. Where work is satisfactory a copy of this form is provided to the installation owner and the contractor. Where there are non-compliances an escalation process is used (see “Enforcement activities for non-compliant gas installations” for more detail).

Where new type B (industrial and large commercial) gas appliances are installed, it is mandatory that they are individually inspected and tested for compliance with AS 3814. If deemed compliant the equipment can then be certified and then commercially operated.

Select Solutions P/L - a division of the gas distributor SP Ausnet and Tamar Gas Certification (TGC) were both assessed as technically competent and approved by the Technical Regulator to undertake this task. The Technical Regulator in turn carries out sample audits of type B certification work performed by both certifiers. These arrangements have been operating successfully since their commencement in 2014.

Office of the Technical Regulator Gas Field Audit

Stage: Type: Case: Date:

Customer name: Email:
 Installation address: Phone No:
 Installation date: COC Issued: COC No:

Contractor name: Email: PGE:
 Contractor address: Phone No:
 Worker name: PGE:

Type of Installation:
 Inspection Type: Installation Type: Gas Type: Property Type: Pressure:

Comments:
 150 kW refurbished Maxtherm Steam Boiler installed. New flue fitted. Existing natural ventilation is adequate and COP provided by a second stage (P/G) regulator. Type B certification completed and boiler is labeled accordingly. Gas and Type B certificates sighted. Does appliance/installation comply with AS/NZS 6801 standard and manufacturer's instructions?

1. Test for soundness	Sound	Rate of Escape:					litres/hour
2. Gas Supply/Pipe Size	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
3. Ventilation	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
4. Flue Position/Distances	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
5. Pipework Materials/Supports	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
6. Flue Materials	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
7. Hose Assembly/Restrains	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
8. Restriction on Flueless App.	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
8. Adjacent Combustible Surfaces	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
10. Location (LPG Cylinder)	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
11. Installation- LPG cylinder/regulator	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
12. Cylinder Safety Valve Discharge	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
13. Appliance Support	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
14. Electrical Requirements	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
16. General Workmanship/Good Practice	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
18. Commissioned to Manufacturer's Instructions	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		
17. Safe Working Order	<input type="text" value="CRK"/>	<input type="text" value="HWS"/>	<input type="text" value="SPHTR"/>	<input type="text" value="CIHTR"/>	<input type="text" value="OTHER"/>		

Comments:
 Neat work. Emergency gas isolation valve and gas pipes labeled.

Remedial action? By: Before:

Comments:

Auditor: OTR: Other:

Figure G7: Example of gas e-audit form

Mobile installations in recreational vehicles

The Technical Regulator pays close attention to the standard of LP gas installations and appliances in caravans, motor homes, houseboats, river craft and small sea going vessels - including prawn boats.

Imported recreational vehicles (motor homes, caravans and camper trailers) as well as imported yachts warrant attention because they may include unique proprietary gas pipe and jointing systems not covered in the Installation Standard and appliances that are not certified to the appropriate Australian Appliance Standards.

Similar concerns apply to some imported boats. Gas safety is an ongoing consideration when a gas system or appliance repairs and maintenance is required due to the lack of spare parts. The Technical Regulator encourages importers to make space provision for appliances during the construction of boats or recreational vehicles and then source appliances certified for use in Australia and fit them on arrival in

Australia hence ensuring the provision for spare parts and manufacturer warranty to overcome these issues.

South Australian registered commercial marine and river craft come under the control of the Australian Maritime Safety Authority (AMSA) who have delegated authority to the Department of Planning, Transport and Infrastructure (DPTI), Vessel Unit in South Australian to provide day to day operations.

Commercial houseboats are required to be periodically surveyed by DPTI accredited marine surveyors. Marine surveyors may advise the owner of the vessel to have a gas safety inspection carried out by a licensed contractor in advance of the slips survey so that the owner can provide evidence of fitness for purpose, by way of a copy of a gas Certificate of Compliance.

Because of the Technical Regulator's auditing activity in this area, some insurance companies have become more aware of gas safety requirements and now insist that the gas installation is certified before marine or catering vehicle insurance policies will be issued or renewed.

Temporary kitchens at outside events

Temporary kitchens are set up to cater for outside public events and in most cases these kitchens operate on LP gas supplied from portable cylinders located nearby. They may be in trucks, trailers, caravans, marquees or even inside permanent structures such as community halls.

Every year, the Technical Regulator holds pre-event gas safety meetings including power point presentations with organisers of major events. This is done to ensure that the catering companies and smaller itinerant operators on site are aware of gas safety requirements. Common issues that arise relate to installations assembled by the stallholder (e.g. using gas hose assemblies) rather than using a licensed gas fitter. Most appliances used at these events are portable burners or barbecue style appliances and it is not mandatory for a gas fitter to connect them.

The areas that are most closely monitored are the condition and protection of the appliances, gas cylinders, regulators and hoses and ensuring that there is sufficient provision for ventilation and clearance from combustibles especially where traders and the public are present. The figure below demonstrates an example of a temporary cooking setup found at an outside event. The operator was advised to secure and protect the flexible hoses connecting the portable appliances.



Figure G8: Example of a damaged gas hose on a temporary cooking setup at an outside event

The Technical Regulator typically sends inspectors to patrol public event sites during the set up and then randomly during the event to ensure continuing compliance. The Technical Regulator works closely with

inspectors from SafeWork SA and private event safety consultants to educate and improve the safe use of gas. Thus, gas related incidents at public events have declined over time and the safety standards demonstrated have improved significantly.

Figure G9 provides an example of a mobile catering food caravan trading in Adelaide's CBD. Here the portable power generators are installed too close to the gas cylinders and the operator was advised to have the generators relocated to provide the correct clearance from the LP gas cylinders.



Figure G9: Example of non-compliant portable generators (Modifications have since been undertaken to the appliance installation to conform to the Standard)

Audits of permanent gas installations at tourist and caravan parks

The Technical Regulator also focuses on the safety of gas installations in caravans and tourist parks. Some of these parks are located close to major centres and use natural gas but most use LP gas for hot water and cooking as well as for on-site kitchen and laundry facilities.

In addition to communal facilities, the Technical Regulator inspects gas installations in permanently occupied caravans or cabins. Permanent residents pay rent to the park owner for the site but are responsible for their own utility bills as well as any repairs and maintenance to gas installations or appliances. Long term residents are sometimes in poor financial circumstances and gas installation and appliance maintenance may be neglected as a result.

The Technical Regulator may, in extenuating circumstances, extend the period allowed for the work to be made compliant provided there is no immediate danger to the resident or neighbours. In unavoidable circumstances, where remedial work cannot be delayed, the gas inspectors will either disconnect the gas supply or make an arrangement with the park owner/manager to have the work completed.

The example below shows a cooking facility that required the replacement of the LP gas regulator due to gas leaking and rectification of the high-pressure cylinder connection and prohibited jointing.



Figure G10: Example of a communal cooking facility at a caravan park that required modification

Where a caravan is used as a permanent accommodation, it is unregistered and the wheels are usually removed and other structures may also be attached from the ground to the van. In this case the installation is treated as a residential dwelling and not a mobile home. The electricity, water and gas are permanently connected.

Flame Effect Burners used in Public Events or Productions

The Technical Regulator inspects flame effect burner systems and their associated controls manufactured/assembled by pyro technicians/gasfitters for use in public events such as the Fringe Festival, corporate events, or playwrights at the Festival Theatre.

Manufacturers and event organisers are made aware of their legal and technical responsibilities in relation to the *Gas Act 1997*, the *Plumbers, Gas Fitters & Electricians Act 1995* and Work Health and Safety (WHS) obligations. Event organisers, operators and flame effect designers/constructors must define the tasks, conditions and limitations of the performance or effect in their designs.

Safe Work Method Statements and Standard Operating Procedures must be formulated and risk assessed to eliminate/minimise risks of injury or damage to property. Participants must also be provided with appropriate training and Personal Protective Equipment and a hierarchy of controls need to be implemented to manage the risks in setting up, commissioning, operation and decommissioning. All relevant regulatory jurisdictions should be notified of the activity, i.e. MFS / CFS / SafeWork SA / Councils if permits are required.



Figure G11: Examples of LP gas effect fires used at outdoor events

Enforcement activities for non-compliant gas installations

The Technical Regulator's enforcement activities with respect to non-compliant gas installation work are on a graduated scale which escalates according to the degree of non-compliance found during a pro-active audit or as a result of an inspection prompted by a gas consumer complaint or safety report by the trade.

1. *Minor technical non-compliance*

A copy of the audit pro-forma is left with the owner and a warning letter together with a compliance statement is posted to the installation contractor with a request to remedy the situation. A follow up phone call is made to the owner to confirm that the non-compliance has been remedied once the compliance statement is returned by the contractor to the Technical Regulator.

2. *Significant but non-hazardous non-compliance*

A copy of the pro-forma accompanied by a warning letter and compliance statement is sent to the contractor. The letter, endorsed by the installation owner, asks the gas fitter return to the site within a given time frame, to remedy the non-compliances. The owner is notified that significant remedial work is required. A signed and dated compliance statement must then be sent back to the Technical Regulator by the contractor or owner to confirm that the remedial work has been completed. A follow up inspection may be done at the discretion of the Technical Regulator.

3. *Non-compliance posing an immediate danger to persons or property*

As above except to make such an installation safe the Technical Regulator's inspector may be required to isolate an appliance or part of the system or cut off the gas supply to the premises. After the defect has been remedied a signed and dated compliance statement must then be sent back to the Technical Regulator. A follow up inspection will definitely be carried out. An expiation notice may be issued for defective work. Expiation notices impose a fine of \$315 + \$60 victims of crime levy per breach for defective work. An expiation notice may include up to three breaches for any one gas installation job.

4. *Prosecution*

The Technical Regulator may prosecute a contractor where the non-compliance is so serious as to constitute gross negligence or where a contractor has a recalcitrant history of significant non-compliances.

The process is generally as above with the exception that no expiation is levied. The evidence, comprising of various interview/investigation notes, statements, photographs and measurements/observations/reports are gathered to the standards required to satisfy crown law requirements for legal action.

In some circumstances the original contractor cannot or will not return to the site to remedy the non-compliance/s due to licensing or commercial issues and sometimes the owner will not allow the contractor back on the site. In these situations, the owner must engage a third-party gasfitter to make the installation compliant. A signed and dated compliance statement must then be sent back to the Technical Regulator and a follow up verification audit will be carried out.

5. *Disciplinary interviews / desk top audits*

Where repeated non-compliant gas installation work can be attributed to a specific worker or contractor, an interview is arranged. This has been found to be generally much more cost effective than prosecution. The interview is carried out with two authorised officers in attendance and is recorded after the person is first formally cautioned. The aim of the interview is to establish the following:

- To identify and emphasise the seriousness of the breaches;
- To ascertain whether the breaches occurred as a result of negligence or a lack of knowledge; or
- If the person was working beyond the scope of their licence and personal competence.

Where a licensing issue is found, the contractor will be referred to CBS with a recommendation from the Technical Regulator that disciplinary action is considered to suspend or cancel the gas fitting worker's registration or contractor's licence.

Alternatively, or in addition, a recommendation may be made that the worker or contractor attends remedial upskill training to overcome knowledge/skill deficiencies.

Referrals to CBS

Where unlicensed work includes significant non-compliances with the Gas Installation Standards, the Technical Regulator prefers that a joint CBS and Technical Regulator interview be conducted. In addition to any penalty applied by the Technical Regulator, CBS can also apply various sanctions including licence suspension and, in extreme circumstances, licence cancellation.

If a person is found to be performing gas fitting work while unlicensed, CBS may, in extreme circumstances, prosecute or as a minimum seek a written assurance that the unlicensed person or entity desists from this work.

12.1.5. Gas incidents – Installations

Gas related incidents include natural gas or LP gas, or their products of combustion.

The figure bellows shows the result of a gas BBQ fire resulting from gas leaking from the high pressure POL connection on the regulator/hose assembly. This happened due to operator error. The connection was not tightened in the cylinder valve correctly and was not tested with soapy water as per manufacturer operating instructions.



Figure G12: Gas BBQ fire due to gas leaking from the high pressure POL connection



Figure G13: House fire because of an incorrect DIY appliance installation (Pyrolysis, combustion of flammable material)

The Figure above shows the result of a fire involving Pyrolysis, combustion of flammable timber Pine stud frames in an internal plasterboard wall because of a DIY installation where the single skin metal flue was located too close to the notched timber stud frame header in an internal plasterboard dividing wall. The fire commenced inside the wall and quickly spread up into the roof space causing approximately \$3400 damage.

Section 13: Gas Products

The *Energy Products (Safety and Efficiency) Act 2000* is administered by the Technical Regulator and requires certain proclaimed gas appliances to be tested, certified and labelled before they can be sold, installed and used in South Australia.

Other Australasian jurisdictions have similar legislation. The Technical Regulator works with other Australasian Regulators and Standards Committees to ensure a nationally consistent gas product safety regulatory regime.

13.1. Gas Appliance Certification

Gas appliances are classified as either Type A (generally mass produced, domestic and light commercial) or Type B (heavy commercial, industrial and often unique utilisation). There are currently five Conformity Assessment Bodies (CAB) that can certify Type A gas products in Australia. They are – the Australian Gas Association (AGA), Standards Australia International Global (SAIG) the International Association of Plumbing and Mechanical Officials R & T Oceana (IAPMO), Global Mark and Vipac Engineers & Scientists. Their commonly sighted certification labels are provided in Figure G14.



Figure G14: Certification Label Examples

The Technical Regulator sits on the Gas Technical Regulators Committee (GTRC) and as such takes a pivotal role in their activities. The GTRC has introduced a national database for gas appliances certified by the approved CABs and is working towards a set of national Gas Scheme Rules and an associated Gas Compliance Mark.

13.2. Appliance and Component Recalls and Safety Notices

An approved CAB can suspend or cancel the certification of a gas appliance or component under certain circumstances. Typically, this would occur when:

- The manufacturer wishes to change to an alternate CAB;
- The manufacturer has ceased production of the appliance or component and product certification is surrendered voluntarily;
- The manufacturer has failed to pay ongoing fees or to provide the product to the respective CAB for annual verification inspections or label costs;
- The appliance manufacturer has been found to have modified the appliance, without notifying the respective CAB, so that it does not exactly replicate the appliance as originally certified;
- An appliance has been modified in a way that affects its safety or reliability. Where this happens, the Technical Regulators will call for a product recall or safety notice to be released;
- An appliance is found to be defective in service to a point where it is likely to create a hazard (this does not include normal wear and tear or the lack of maintenance by the operator). Where this happens, the Technical Regulator will expect a product recall or safety notice.

Note - certification may be reinstated if the manufacturer satisfactorily remedies the non-compliance.

13.3. Small Mobile LP Gas Appliances

Every year, the Technical Regulator conducts an auditing programme for appliance retail stores. This provides the Technical Regulator with an opportunity to check if the retailers are selling only approved, certified equipment and that their displays provide all the necessary safety information. In addition, it allows the Technical Regulator to check if these retailers have been notified of any product recall or suspensions and if (or whether) they act in accordance with the notice.

The audits are also an opportunity to educate the retailers to only accept certified goods for sale and to pass on the appropriate safety information to their consumers. It should be noted that any issues that were found during an audit were addressed immediately and the offending product(s) were removed from shop displays. If required, the stock shall be quarantined until the non-conformance had been rectified. This process was in general, well received by store managers.

How to check whether a gas appliance is certified or not?

If buying directly from a retail outlet, the retailer can be asked to show the data plate on the appliance. Examples of data plates are illustrated in Figure G18 and Figure G19. It contains two major indications of gas certification, the certification badge or label and the certificate number. However, if buying a gas appliance online, the certification information observed below can be verified by asking the provider.

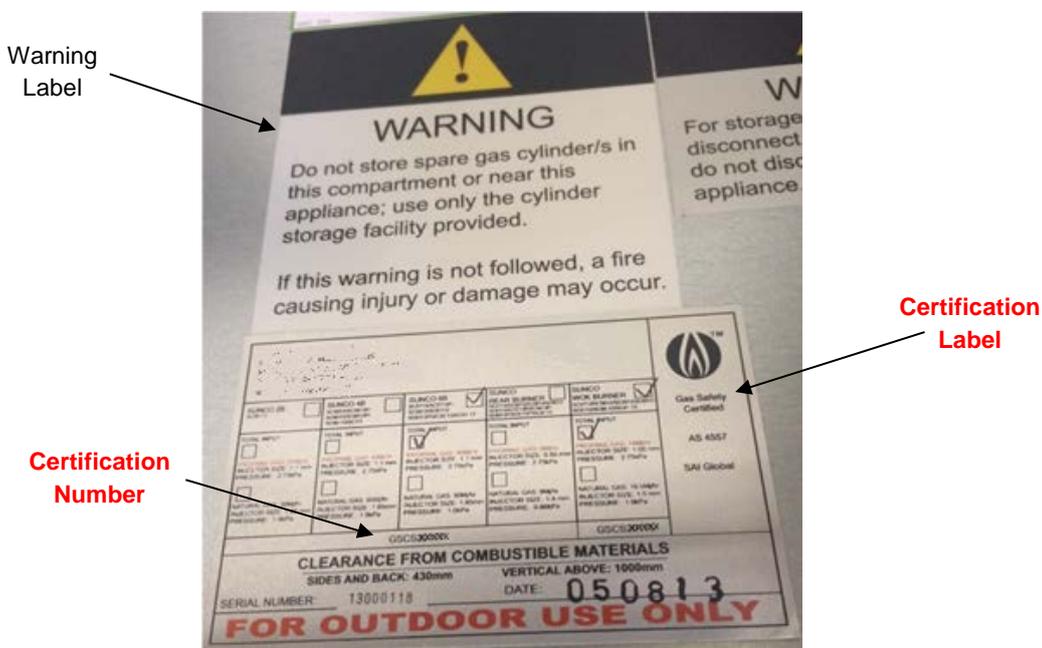


Figure G15: Typical Appliance Markings: (Information Data Plate including certification number, warning and certification label)



Figure G16: Information Data Plate including certification number and certification label

Section 14: Gas Regulatory Coordination

14.1. Safety and Technical Standards

The Technical Regulator is actively represented on the relevant Australian Standards committees and joint Australian and New Zealand Standards committees that deal with gas issues and plays an important role in developing and maintaining the Standards.

These technical Standards define the minimum requirements for the gas quality, design, installation, commissioning, operation, maintenance and decommissioning of gas infrastructure, installations and appliances and ensure that the gas distribution networks are being operated with a high level of safety and reliability. The Standards also address the quality of gas supplied.

14.2. Committee Representation

The Technical Regulator is represented on or has provided valuable technical comments to several Standards Australia committees as well as many other committees, forums and associations.

The Technical Regulator has been, and continues to be, directly involved in the development and promotion of a number of industry technical Standards. Several staff members represent the Technical Regulator on the key Standards committees generally on behalf of the GTRC. The resultant Standards are called up into legislation administered by the Technical Regulator. This provides the way forward in setting the minimum technical and safety requirements and a principle to ensure appropriate safety enforcement.

The Technical Regulator is represented on the following:

14.2.1. AG-006, Gas Installation Committee (AS/NZS 5601 & AS 4575)

This Standards committee is a gathering of industry subject matter experts representing industry stakeholders (i.e. technical regulators, appliance manufacturers, gas suppliers, utilities/network operators, installers, trainers) and industry bodies such as the Master Plumbers Association, the Plumbing Industry Commission and the Australian Building Construction Board (ABCB).

The Technical Regulator is able to communicate information to and from the industry stakeholders (e.g. the trade and GTRC) and Standards Australia to ensure that their views are represented in the development of the Standards.

AS/NZS 5601

The purpose of the committee is to maintain Part 1 Gas installation- general installations and Part 2 LP gas installations in caravans and boats for non-propulsive purposes. The activity in amending these documents is as a result of new innovations and changes to building and work practices, to advancements in materials and appliance technology.

AS 4575

The committee has been authorised to fully revise the aged Standard AS 4575 Quality of Gas Servicing. The revision is a result of new innovations, changes, work practices, advancements in materials and appliance technology. The scope of the Standard will be expanded to include worksite hazards, scoping work, appliance isolations, electrical safety, servicing protocols including fault diagnosis, testing, verification and commissioning in addition to records management and quality systems.

14.2.2. AG-001, Gas Appliances Committee

The purpose of the committee is to develop a new series of gas appliance Standards and to maintain the entire suite of gas appliance Standards that are within the committee's scope. These Standards cover the technical, safety and performance requirements of domestic and light commercial gas appliances, known as type A gas appliances.

The committee has been working on a new series of Standards known as the AS 5263 series of Standards with five new Standards having been published and five more to be published. These Standards are being developed in an attempt to avoid the need to provide a new Standard for every new gas appliance that comes out on the market. They concentrate on the fundamental safety principles of all gas appliances especially things like combustion and temperature hazard requirements and relate them across all gas appliances.

This approach has been adopted by New Zealand and now they are a joint AS/NZS 5263 series of Standards. The Technical Regulator has made a major contribution to this process and the changes that are being made in the gas appliance certification process in the future.

14.2.3. AG-008, Gas Distribution Committee (AS/NZS 4645)

The joint Australia and New Zealand Standards Gas Distribution Committee (AG-008) provides input in developing further revisions to some parts of the Australian/New Zealand Standard AS/NZS 4645 'Gas distribution networks' to ensure safe, reliable and affordable gas distribution systems. These parts are: Part 1: – 'Network Management', Part 2: – 'Steel Pipe Systems' and Part 3: – 'Plastic Pipe Systems'. AG-010, Natural Gas Quality Specifications Committee (AS 4564).

14.2.4. AG-038, Liquefied Petroleum Gas Quality Specifications Committee (AS 4670)

The function of AG-038, the LP Gas Quality Specification Committee, is to maintain AS 4670 Commercial propane and commercial butane for heating purposes. This sets out the gas quality requirements necessary to ensure the suitability of the liquefied petroleum gas for heating purposes.

14.2.5. AG-010, Natural Gas Quality Specifications Committee (AS 4564).

The function of AG-010, the Gas Quality Specification Committee, is to maintain the AS 4564 specification for general purpose natural gas. This specification sets out the gas quality requirements necessary to ensure the safety of general-purpose natural gas transported and supplied for use in natural gas appliances and equipment, and for use as fuel in natural gas vehicles.

14.2.6. Gas Technical Regulators Committee (GTRC)

All Australian jurisdictions as well as New Zealand are members of the Gas Technical Regulators Committee (GTRC). The GTRC held two meetings during 2015/16.

The Technical Regulator maintained close communications with interstate safety regulators through both the formal GTRC channels and informally with peers in those organisations to share technical knowledge, information on appliance safety issues, common interests and concerns. These relationships are vital to ensure that technical expertise is maintained in all areas covered by technical regulation.

Issues featuring highly included the pursuit of a set of "Rules" that can attempt to harmonise requirements across jurisdictions and provide consistency of information to CABs and other stakeholders. *The Rules* when recognised by a Technical Regulator will provide a set of requirements for the operation of a certification scheme when read in conjunction with each jurisdiction's legislation.

An ongoing example of an area of common concern and cooperation between interstate gas regulators is the issue of uncertified gas appliances offered for sale on internet auction sites. Regulators have continued to send out warning letters to the appliance retailers and the internet website agents to warn of this potentially misleading practice.

The GTRC is also monitoring the performance of a number of appliances that are considered to exhibit a higher risk of safety issues these include canister cookers and area heaters.

The GTRC has also been monitoring issues associated with carbon monoxide (CO) poisoning and the individual jurisdictional response to issues surrounding the risks associated with gas appliances and CO. It should be remembered that if gas does not burn correctly CO is produced. CO is a colourless, odourless

and tasteless gas which is very poisonous and the human body doesn't recognise its presence. Given these properties it can kill and hence it is often known as 'the silent killer'.

The GTRC strategy of running a CO awareness campaign continues to be a major component of the Technical regulators safety awareness campaign. Information is contained on the "Be Energy Safe" website located at sa.gov.au/energysafe. The website emphasises the need for correct room ventilation and regular gas appliance maintenance as well as only using appliances for what they are designed to do (i.e. do not use appliances that are designed for outdoor, inside your home).

14.2.7. Other Committees, Forums and Representation

- **The Plumbing and Gas Fitting Advisory Forum;**
- **Standards Australia Gas Sector Advisory Forum:** The Technical Regulator has membership in this forum and is thus involved in the strategic direction for the development of all gas related Standards;
- **The Australian Institute of Energy:** The Technical Regulator has membership in this organisation to stay informed about activities being undertaken across the energy industry;
- **Gas Energy Australia:** The Technical Regulator has membership in this organisation to stay informed about development in the LP gas, compressed and liquefied natural gas industries;
- **River Murray Houseboat Hirer's Association:** The Technical Regulator liaises with the association and provides technical and safety information relating to LP gas installations on houseboats;
- **Plumbing Industry Technical Forum:** The Technical Regulator provides advice on legislation and Standards relating to natural gas and LP gas installation and appliance safety;
- **Caravan and Camping Association of South Australia (CCASA):** The Technical Regulator provides advice and technical assistance to ensure that gas installations and appliances comply with technical and safety Standards;
- **Domiciliary Care and Royal District Nursing Society (RDNS):** The Technical Regulator provides advice with respect to making installations and appliances safe where elderly, infirm or blind people are involved or where the householder may suffer from dementia;
- **National Gas Industry Training Package:** In 2015/16, the UEG06 Package (training package for workers employed by, or contracting to, gas distribution companies to work on their infrastructure) was again reviewed and further changes were proposed for endorsement as part of continual improvement;
- **Damage Avoidance Committee:** This committee was formed and facilitated by SafeWork SA for Industry stakeholders / State and Federal Government interaction on water-gas-electrical and various communications utilities). The preliminary focus covers damage avoidance of infrastructure services, stakeholder representation to collaboratively formulate codes of practice and produce safety education material for industry. The OTR gas and electrical groups are represented on this committee.
- **SafeWork SA:** SafeWork SA is responsible (under the *Dangerous Substances Act 1979*) for the storage and handling of LP gas, where the quantity stored on site exceeds 560 litres. The Technical Regulator Gas Installation and Appliance section and SafeWork SA have excellent two way feedback with respect to safety, installation and storage facilities.

SafeWork SA also works closely with the Technical Regulator when investigating workplace safety accidents where natural gas or LP gas are involved.

National Gas Emergency Response Advisory Committee (NGERAC)

Originally, The Ministerial Council on Energy (MCE) developed a National Gas Emergency Response Protocol. Since then the Council of Australian Governments (“COAG”) has established the COAG Energy Council to provide national oversight and coordination of energy sector decision-making and the COAG energy market reform program. This replaces the MCE.

In Australia, a large proportion of the national gas supply network is interconnected across most State and Territory borders and the COAG Energy Council seeks to facilitate the development of a more reliable, secure and competitive national gas market. The COAG Energy Council has agreed that a National Gas Emergency Response Protocol (“the Protocol”) should be retained to ensure natural gas supply disruptions are managed in a consistent manner across all jurisdictions.

The Protocol contains two main elements:

- Arrangements for inter-jurisdictional consultation on the use of statutory emergency powers in the event of a major natural gas supply shortage;
- Establishment of a government-industry National Gas Emergency Response Advisory Committee (NGERAC). The NGERAC usually meets twice each financial year.

During a major national gas supply shortage, in principle, NGERAC will be a key source of information and advice, but not necessarily the only source for energy Ministers and jurisdictions. The advice provided by the collective committee will seek to ensure efficient and effective responses to and management of major natural gas supply shortages (including the use of Emergency Powers). This advice is based on the need to be timely and to be consistent with maintaining the integrity of the gas supply system and public health and safety.

In the event of a major natural gas supply shortage however, market and commercial arrangements are to operate as far as possible to balance gas supply and demand as well as maintaining system integrity. NGERAC would be activated (time permitting) to assist in an event of a potential or actual multi-jurisdictional gas supply shortage or where a single impacted jurisdiction has requested that the NGERAC be convened for the purpose of sharing information.

Volume III - Water Industry

Preface

This volume covers the Technical Regulator's operations under the *Water Industry Act 2012*.

Water Industry Act 2012

Section 3 of the *Water Industry Act 2012* states that:

"The objects of this Act are—

- (a) to promote planning associated with the availability of water within the State to respond to demand within the community; and
- (b) to promote efficiency, competition and innovation in the water industry; and
- (c) to provide mechanisms for the transparent setting of prices within the water industry and to facilitate pricing structures that reflect the true value of services provided by participants in that industry; and
- (d) to provide for and enforce proper standards of reliability and quality in connection with the water industry, including in relation to technical standards for water and sewerage infrastructure and installations and plumbing; and
- (e) to protect the interests of consumers of water and sewerage services; and
- (f) to promote measures to ensure that water is managed wisely."

The Technical Regulator is established by Section 8 of the *Water Industry Act 2012*.

Section 9 of the *Water Industry Act 2012* provides:

"The Technical Regulator has the following functions:

- (a) to develop technical standards in connection with the water industry;
- (b) to monitor and regulate technical standards with respect to—
 - (i) water and sewerage installations and associated equipment, products and materials (including on the customer's side of any connection point); and
 - (ii) plumbing;
- (c) to provide advice in relation to safety or technical standards—
 - (i) in the water industry to the Commission at the Commission's request; and
 - (ii) in the plumbing industry;
- (d) any other function assigned to the Technical Regulator under this or any other Act or conferred by regulation under this Act."

The aim of the *Water Industry Act 2012* is "to facilitate planning in connection with water demand and supply; to regulate the water industry, including by providing for the establishment of a licensing regime and providing for the regulation of prices, customer service standards, technical standards for water and sewerage infrastructure and installations and plumbing, and by providing performance monitoring of the water industry; to provide for other measures relevant to the use and management of water; to make amendments to various related Acts; to repeal the *Sewerage Act 1929*, the *Water Conservation Act 1936* and the *Waterworks Act 1932*; and for other purposes".

The Technical Regulator provides input and is involved in a range of activities in liaison with the water industry and other government agencies.

Section 15: Water and Sewerage Infrastructure

15.1. Introduction

Infrastructure is defined as the structures, systems and facilities that service the community, and water and sewerage infrastructure is the infrastructure into which the plumbing contractors connect on-site plumbing (including drinking water, non-drinking water (recycled water) and drainage installations).

Water and sewerage infrastructure includes but is not limited to:

- Drinking water distribution systems;
- Drinking water treatment and storage facilities;
- Sewage collection systems;
- Sewage treatment and storage facilities;
- Community wastewater management collection systems;
- Wastewater treatment and storage facilities;
- Non-drinking water distribution systems;
- Non-drinking water treatment and storage facilities;
- Non-drinking water harvesting and reuse systems.

Water and sewerage infrastructure that provides a service to a customer is typically the responsibility of a water industry entity (such as SA Water, local Council or a private company). By comparison, on-site plumbing, drainage and associated equipment downstream of the meter or property connection is the responsibility of the property owner.

15.2. Water Industry Entities

A water industry entity is defined in the *Water Industry Act 2012* and designates any entity providing water and/or sewerage retail services in South Australia. There are three main categories of water industry entities: major, intermediate and minor, which are based on connection numbers (a full list of entities can also be found on the Commission's website).

There are currently 68 licensees in South Australia and a total of 65 Water Industry Entities (three water industry entities have two separate licences) across the three categories as presented in Table W1. There is a single major water industry entity in South Australia being SA Water.

Table W1: Licences classifications

Classification	Number of connections	Number of Licensees in SA
Minor	Less or equal to 500	28
Intermediate	Between 500 and 50,000	39
Major	More than 50,000	1
Total for South Australia		68

SA Water provides drinking water and sewerage services to approximately 1.6 million people in SA. The remaining water industry entities are classified as intermediate and minor as per the above table and provide services across the whole of South Australia servicing metropolitan, outer metropolitan and regional townships, as presented in Table W2.

Table W2: Water industry entities per region in South Australia

Region	Number of Water Industry Entities
Metropolitan	25
Northern Areas	18
Eyre Peninsula	11
South East	6
Riverland	5
Total for South Australia	65

The split between the services provided by the water industry entities is presented in Figure W1.

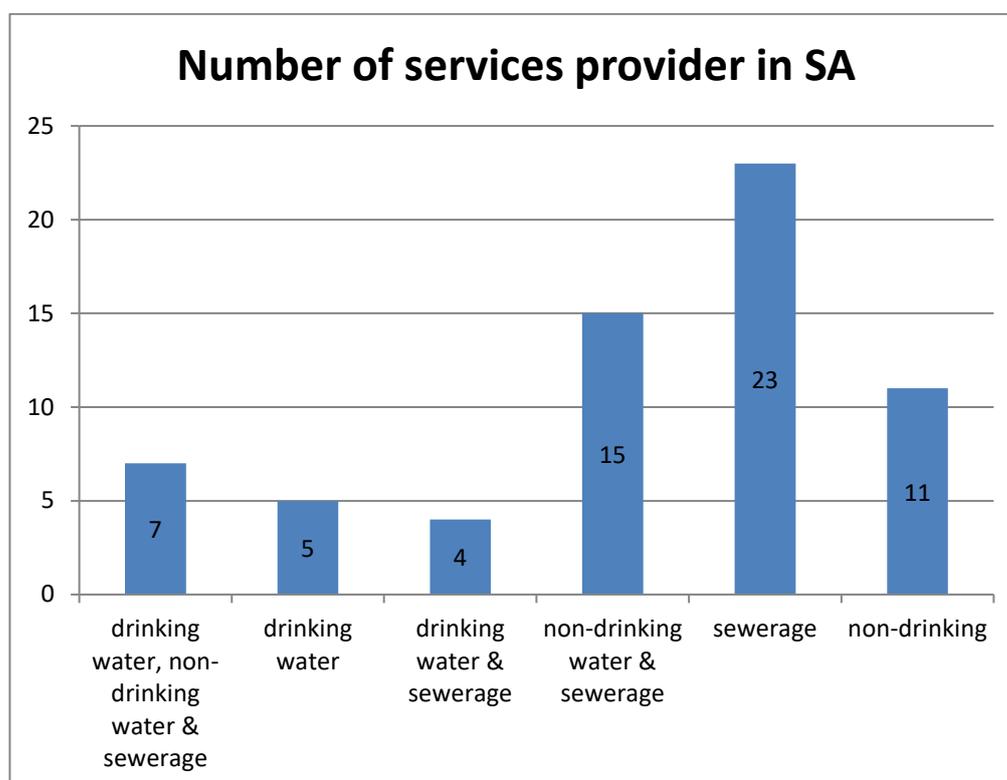


Figure W1: Split between services provided by water industry entities in South Australia

Of the current 65 water industry entities in South Australia, most provide sewerage services (85% of all entities) via Community Wastewater Management Schemes (CWMS), formerly known as Septic Tank Effluent Disposal Schemes (STEDS). These schemes typically comprise a gravity drain collection network (connecting to customers' on-site septic tanks), which convey all of the septic tank effluents to a treatment system and disposal facility. CWMS are typically owned, operated and managed by local Councils as the water industry entity.

In addition to drinking and sewerage services, water industry entities can provide non-drinking water services which include the distribution of non-drinking water for irrigation and non-drinking water use, such as toilet flushing.

15.3. Regulation of Water Industry Entities

Water industry entities must provide their SRMTMP to the Technical Regulator in accordance with the *Water Industry Act 2012* and *Water Industry Regulations 2012*.

The SRMTMP shall include the following matters, as a minimum:

- Safe design, installation, commissioning, operation, maintenance and decommissioning for water and/or sewerage infrastructure owned or operated by the water industry entity;
- Maintenance of water and/or sewerage services of the quality required to be maintained by or under the *Water Industry Act 2012*, the *Water Industry Regulations 2012*, Licence or other conditions;
- Monitoring compliance with safety and technical requirements imposed by or under the *Water Industry Act 2012*, the Regulations, Licence or the conditions of any exemption;
- Monitoring water and/or sewerage infrastructure owned or operated by the water industry entity that is considered unsafe or at risk of failing or malfunction;
- Establishment of indicators and the collection and recording of information to measure the water industry entity's performance.

SRMTMPs are 'live' documents and any changes and/or revisions are required to be approved by the Technical Regulator.

Following the submission and subsequent approval of a SRMTMP by the Technical Regulator, the water industry entity must complete audits as described in Sections 2.3.1 and 2.3.2.

SRMTMP Assistance

The *OTR Guidance Document* provides advice and assistance to water industry entities for the development of their SRMTMP that is acceptable to the Technical Regulator and deemed to comply with the *Water Industry Act 2012* and *Water Industry Regulations 2012*. In the absence of equivalent Standards pertaining to the water industry, the Guidance Document is structured in a manner that is consistent with Australian Standards for similar documents in the gas industry. The focus is placed on safe and reliable operation for people and plant to ensure a safe and reliable service to customers. In many cases, the water industry entity already has existing documentation which meets the minimum information required.

In addition to the Guidance Document, the Technical Regulator has supporting documents for water entities to better understand their obligations and technical requirements.

15.4. Water and Sewerage Infrastructure Incidents

15.4.1. Water and Sewerage Infrastructure Incident Classification and Notification Protocol

There is a Water and Sewerage Infrastructure Incident Notification and Communication Protocol, which provides water industry entities with a clear understanding of their notification and reporting requirements to the Technical Regulator. The Protocol is an overarching document, is applicable to all water and sewerage infrastructure, and provides incident classification and notifications requirements. The protocol does not absolve the entities from responsibilities to any other agencies, such as those that are included in the Department for Health and Ageing (DHA) / Environment Protection Authority (EPA) Water/Wastewater Incident Notification and Communication Protocol or other similar documents.

The Technical Regulator periodically updates the protocol to ensure that the information is current and accurately reflects all water and sewerage infrastructure incidents and regulatory requirements.

15.4.2. Other Incident Classification and Notification Protocol

The Technical Regulator is also included in the DHA and EPA Water/Wastewater Incident Notification and Communication Protocol as a notifiable agency. This Protocol is specific to SA Water, EPA and DHA and was first established in 1999. This protocol meets the *Safe Drinking Water Act 2011* requirements for an approved incident identification and notification protocol.

Section 16: Plumbing Installations

16.1. Plumbing Regulation

The *Water Industry Act 2012* and the *Water Industry Regulation 2012* provide the legislative framework for the regulation of the on-site plumbing industry in South Australia. The Technical Regulator monitors and regulates plumbing and associated equipment, under section 9 of the *Water Industry Act 2012*. On-site plumbing installations are audited for compliance with the Performance Requirements of the National Construction Code (NCC) Volume 3 – Plumbing Code of Australia (PCA).

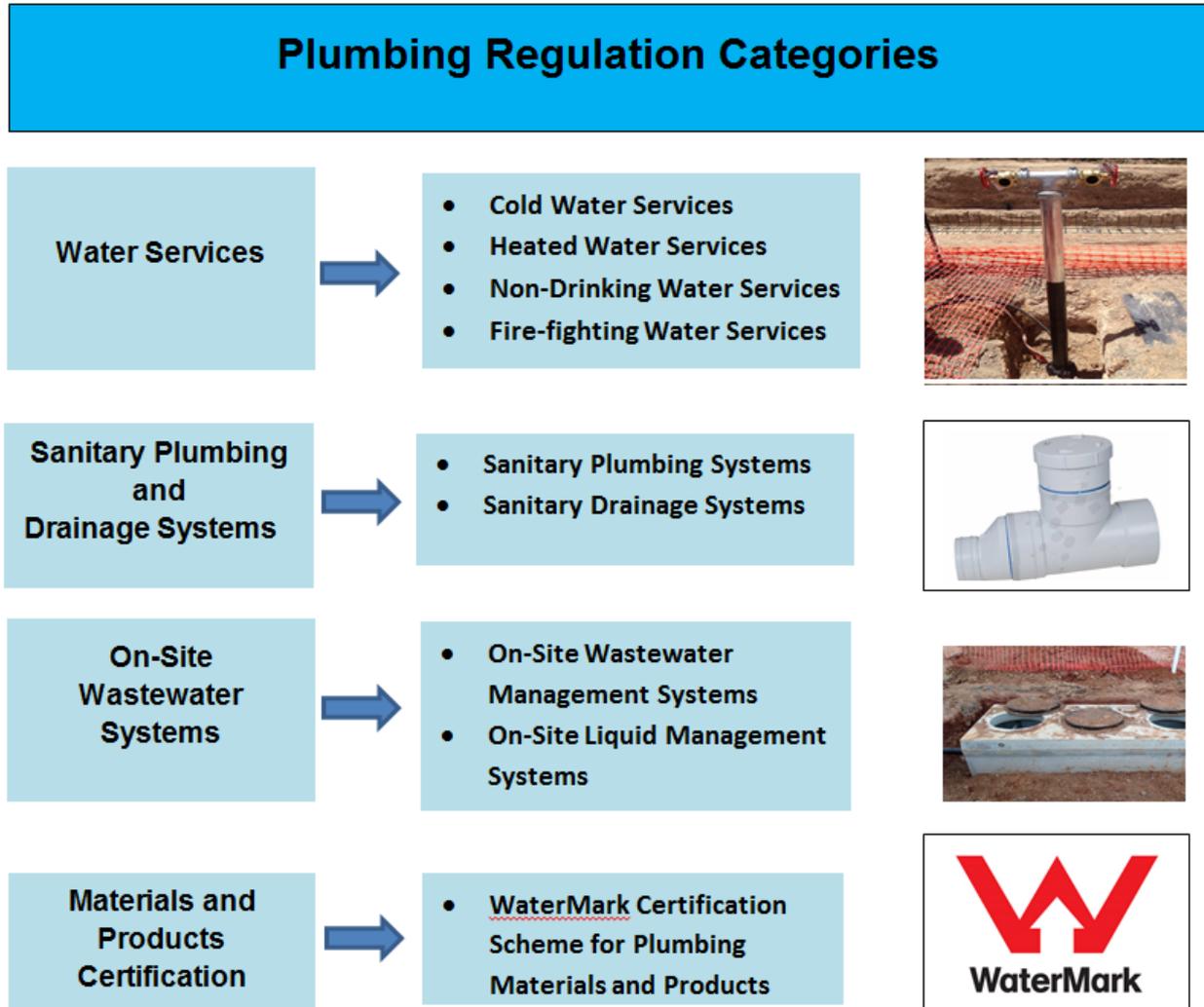


Figure W2: Plumbing categories that are monitored and regulated through on-site audits by the Office of the Technical Regulator

16.2. Plumbing Compliance

The Technical Regulator is responsible for monitoring and regulating technical Standards with respect to on-site plumbing. Licensed plumbing contractors must give due notice to the Technical Regulator where plumbing and equipment is installed on-site. Non-compliant plumbing installations identified through routine sample audits of plumbing installations or from feedback provided by industry and the general public are rectified to ensure technical compliance with the Plumbing Standard issued by the Technical Regulator under section 66 of the *Water Industry Act 2012*.

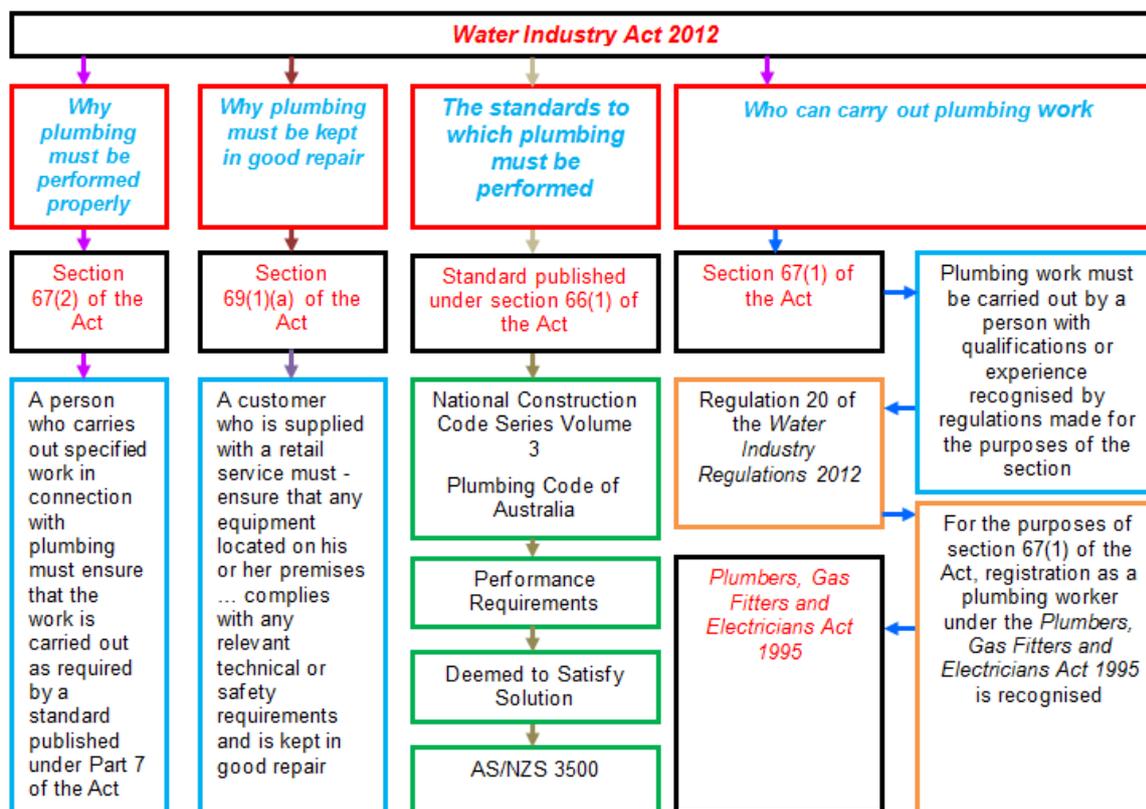


Figure W3: Details of plumbing obligations under the Water Industry Act 2012

16.3. Plumbing Audits

16.3.1. Plumbing Bookings and Audits

The Technical Regulator audits plumbing installations in South Australia for compliance with the Plumbing Standard published pursuant to Section 66 of the *Water Industry Act 2012*. This Standard has adopted relevant sections of the PCA. All plumbing installations must meet the performance requirements of the PCA through the deemed-to-satisfy solutions of AS/NZS 3500 plumbing and drainage Standard or by a performance solution.

The plumbing installations audited can range from the addition of a toilet en-suite, a residential home, to more complex commercial installations within shopping centres or multi-storey high-rise apartments. Final audits are undertaken to monitor more complex multi-storey installations or in situations where ongoing non-compliance has been identified.

Auditing Policy

The Technical Regulator selects sites for auditing by:

- Scheduling a random selection of sites by relying on the integrity of the Plumbing case management system to identify all plumbing work being performed through the booking process;
- Focussing on a particular category of plumbing, based on the risk involved e.g. maintaining a regular presence in the south-east region, where there are currently no local inspectors, by scheduling periodic visits from head office and maintaining a strong focus on non-drinking water installations and backflow protection;
- Responding to complaints from either the public or plumbing industry;
- Responding promptly to emergency situations.

Failed jobs are monitored through a fortnightly review allowing the Technical Regulator to ensure all outstanding non-compliant installations are accordingly rectified.

Plumbing audits booking system

The Technical Regulator maintains a plumbing case management system to record information relating to on-site plumbing audits. This System records the plumbers audit request dates and the results of the audits carried out by the OTR plumbing installation officers.

Commercial and industrial plumbing inspections include:

- Above-Ground Sanitary
- Backflow Audits
- Drainage
- Encumbrance Investigations
- Final Inspections
- Fire Services
- Hot & Cold Installation
- Hot Water
- Rainwater Inspection
- Non-Drinking Water In-Ground
- Non-Drinking Water In-Wall
- Non-Drinking Water – Investigations
- Sewer Investigations
- Site Meetings/Inspections
- Team Meetings
- Trade Waste Plumbing
- Underfloor Plumbing
- Water Inspections/Investigations.

Residential plumbing inspections include:

- Above ground sanitary
- Building plans
- Drainage
- Final inspections
- Fire services
- Hot & Cold water
- Recycled water in-wall
- Hot & Cold Installation
- Hot Water
- Rainwater Inspection
- Non-Drinking Water In-Ground
- Non-Drinking Water In-Wall
- Non-Drinking Water – Investigations
- Sewer Investigations
- Site Meetings/Inspections
- Trade Waste Plumbing
- Underfloor Plumbing
- Water Inspections/Investigations.

16.3.2. Policy for Acting on Non-Compliance

In each case of non-compliance, the seriousness of the offence is assessed by:

- Comparing the quality of the plumbing work presented with the plumbing installation performance requirements set out under the Plumbing Code of Australia;
- Determining the technical and safety aspects of the non-compliant plumbing work for both the customer concerned and the general public;
- Identifying what actions are required to address the cause and correct the condition.

Once the seriousness of the breach is determined, the Technical Regulator acts on the non-compliance according to the severity of the breach by taking escalating measures such as:

- Education;
- Warning;
- Notice to rectify in the form of enforcement notices;
- Encumbrance raised against the affected property;
- Expiation of the Plumbing Contractor;
- Prosecution for the most serious offences.

16.3.3. Inter-Agency Referrals to Consumer and Business Services

The Technical Regulator provides CBS with information of serious breaches of the *Water Industry Act 2012* related to on-site plumbing work undertaken by specific plumbers. The Technical Regulator additionally advises CBS where a plumber is operating outside of the scope of their trade license.

16.3.4. Fees for Reinspection

The Technical Regulator introduced a reinspection fee to be charged to plumbing contractors who must rectify and re-submit plumbing installations for further auditing.

Commensurate with the reasonable costs associated with on-site reinspections of non-compliant plumbing, a service fee can be charged in accordance with regulation 35(1)(a) of the *Water Industry Regulations 2012*:

If-

- (a) *a person's acts or omissions require the Technical Regulator (or a person acting on behalf of the Technical Regulator) to undertake a reinspection of any work, or to re-attend at any place for any other reason, in connection with the operation or requirements of a standard under Part 7 of the Act, the person is liable to pay a fee of an amount equal to the reasonable costs of the reinspection or reattendance (as the case may be).*

Fees are payable via cheque, money order, credit card or B-Pay and the plumbing work must not be covered over until the reinspection has occurred and the work is compliant.

16.3.5. Expiations

Regulation 41 of the *Water Industry Regulations 2012* provides for the expiation of breaches against the *Water Industry Act 2012*, allowing the Technical Regulator to enforce compliance of plumbing work.

While the decision to expiate is not taken lightly, it is used on occasions where the technical and safety aspects of an on-site plumbing and equipment installation place the customer or the integrity of the property at risk.

Non-drinking water installations have the potential to compromise public health through contamination of the drinking water network supply.

While every effort is made to work with the plumbing industry to assist plumbers in complying with the Plumbing Standard, it is ultimately up to the certifying plumber to ensure that their work is compliant.

16.3.6. Hydraulic design submissions

In addition to plumbing audits, hydraulic designs of sanitary plumbing and drainage installations are required by the Technical Regulator for commercial and more complex residential plumbing installations. Hydraulic designs are required by the Technical Regulator when auditing on-site plumbing installations and for desktop referencing of plumbing installations should information or advice be required by industry.

The Technical Regulator requires plumbers to submit hydraulic designs submissions for the following types of developments:

- Commercial and industrial developments, including extensions;
- Multi-storey developments of three or more floor levels;
- Building developments within the Adelaide CBD;
- Housing developments of three or more dwellings;
- Any building that includes an alternative performance based plumbing design;
- Non-drinking water irrigation installations for recreational and commercial/industrial sites, and residential sites.

The lodgement of hydraulic designs and the subsequent booking of inspections by the plumbing contractor is an important part of monitoring and regulating on-site plumbing. The hydraulic design submission process encourages compliant and safe plumbing work particularly in major developments across the State. Smart hydraulic design, in accordance with the National Construction Code Volume 3, ensures durability, ongoing quality and economic value for commercial developments within the Adelaide CBD and

across the state of South Australia. Design plans can additionally identify the use of compliant products and materials on the customer's side of an installation.



Figure W4: Examples of Drainage Plumbing Installations for Residential Developments

16.3.7. Metropolitan Areas

Most plumbing bookings of on-site sanitary underfloor and drainage inspections are undertaken in the Metropolitan areas and include sanitary underfloor and drainage inspections, mainly related to residential developments.



Figure W5: Installations auditor at the University of South Australia

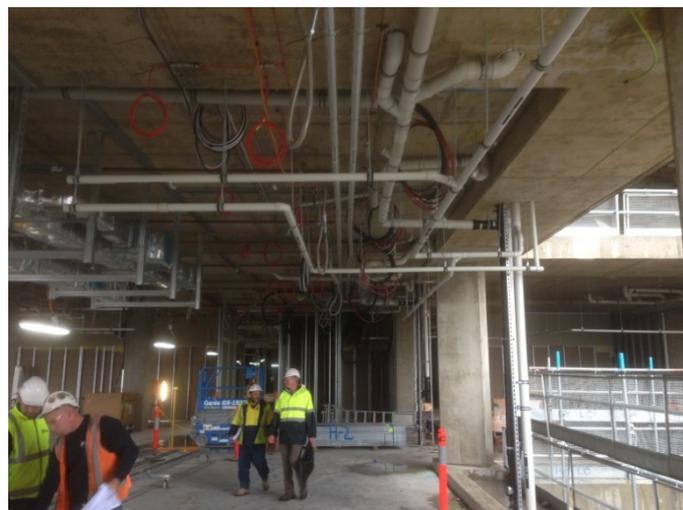


Figure W6: Technical Regulator audit of the New Royal Adelaide Hospital (NRAH)

16.3.8. Regional Areas

The Technical Regulator has maintained the OTR's regulatory presence in regional areas through programmed audits of on-site plumbing. The Technical Regulator has one full time Regional Plumbing Installations Inspector based in Port Pirie. This inspector conducts audits of plumbing installations north of Adelaide including the Mid North and Eyre Peninsula regions.

Regional areas including the Barossa, Murray lands and the South-Eastern areas of the State are monitored by Adelaide based plumbing installations inspectors. This requires targeted regional visits to Kangaroo Island, Mount Gambier, Port Lincoln and the Yorke Peninsula.

The Technical Regulator is dedicated to ensuring the integrity of the State's drinking water supply and continues to highlight non-compliance issues and provide standard updates to the Department for Health and Ageing and those local Councils responsible for auditing on-site wastewater systems where the plumbing and equipment are not connected to SA Water's sewerage/water infrastructure.

16.4. Non-Drinking Water (Recycled Water)

Non-drinking water is water that has been generated from sewage, greywater or stormwater systems and treated to a standard that is appropriate for its intended use. In South Australia, recycled water is typically provided by a water industry entity through a reticulated water network system to dedicated properties for use. Most properties supplied with recycled water have a dual supply consisting of a drinking water supply for personal hygiene use and a non-drinking water supply (recycled water) for gardens and non-personal hygiene use.

In South Australia, the number of non-drinking water sources has increased with many residential developments (i.e. subdivision) adopting dual water reticulation services to properties. Consequently, this has dramatically raised the risk to the technical and safety integrity of on-site plumbing and non-drinking water infrastructure systems. Ensuring a safe drinking water network is paramount to the health of the community which is why non-drinking water systems require appropriate management systems to be in place to prevent cross-connection of drinking and non-drinking water supplies.

Water industry entities, consultants, landscapers, irrigators, plumbers and property owners involved with non-drinking water systems are to comply with requirements as set out in the *Water Industry Act 2012* and associated legislation. The Technical Regulator conducts numerous training and education sessions with the industry to raise awareness of their responsibility to ensure non-drinking water system installations are compliant.

The figure W7 shows most of the metropolitan areas supplied with non-drinking water in South Australia.



Figure W7: Areas of metropolitan Adelaide with non-drinking water

Systems can vary in complexity and it is imperative that the industry is made aware of their obligation to ensure the integrity of both the water infrastructure and on-site plumbing systems. The requirement to upskill plumbers in this particular area has become evident through the number of non-compliant non-drinking water installations audited by the Technical Regulator.

All non-drinking water infrastructure and plumbing installations require appropriate warning and prohibition signage indicating that the non-drinking water is not suitable (fit) for human consumption in accordance with AS 1319 as shown in Figure W4.



Figure W8: example of Non-drinking water signage

The Technical Regulator requires the submission of a detailed plan for all sites with multiple water supplies. These must include information showing appropriate backflow prevention devices and accurate hydraulic designs showing there are no cross-connections between the drinking and non-drinking water services.

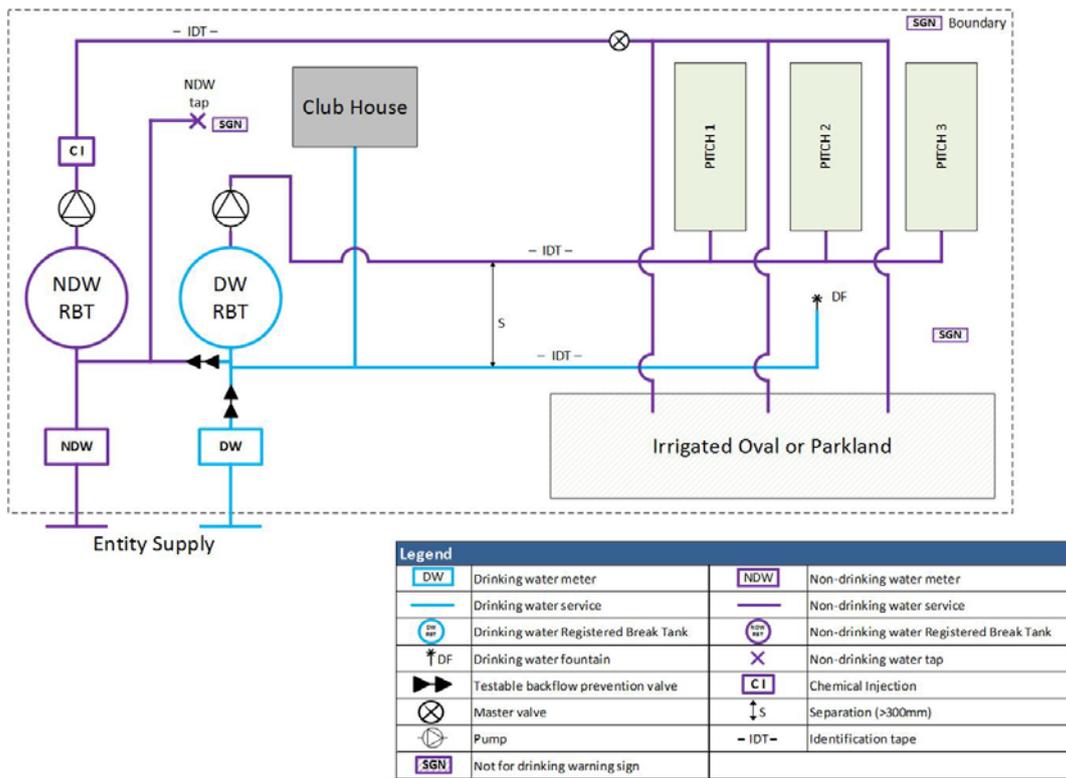


Figure W9: Typical irrigation installation with Registered Break Tanks installed on both water systems

The figure below shows a typical drinking water/non-drinking water installation on a community title development with appropriate signage and physical separation of services.

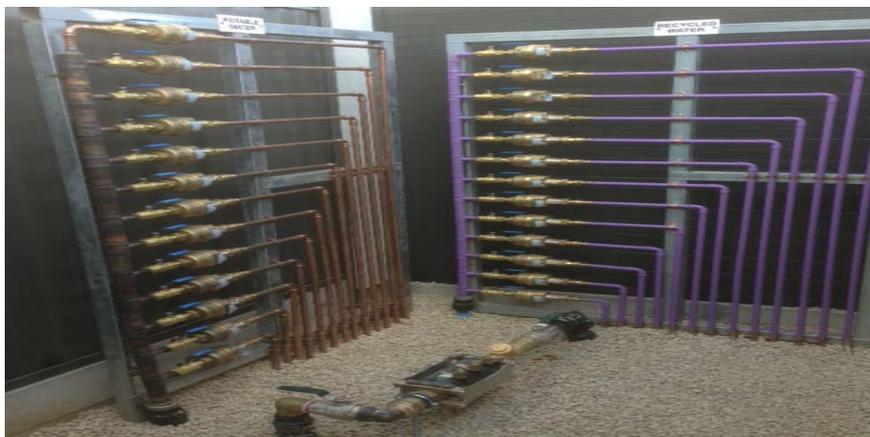


Figure W10: Drinking and non-drinking water meters



Figure W11: Plumbing installation showing in-wall non-drinking and drinking water pipework

16.5. Fire Fighting Water Services

16.5.1. Compliance of fire hydrant water services

The Technical Regulator regulates fire water service installations. Fire hydrant water services must comply with the PCA and referenced Standards AS/NZS 3500.1 - Water Services and AS 2419.1 - Fire hydrant installations - System design, installation and commissioning.

The current Standard requirements mandate that a booster assembly is constructed with WaterMarked products i.e. isolating and backflow prevention valves. There is also a requirement that all materials upstream (inlet side) of the backflow prevention valve be suitable for contact with drinking water. This requirement is covered by AS/NZS 4020 -Testing of products for use in contact with drinking water. Where existing fire services are replaced or upgraded they must meet current regulatory requirements.

The Technical Regulator has audited many sites where major additions and alterations have required fire hydrant water service extensions and in-turn an upgrade to the inlet/booster connections. These audits along with advice from the Technical Regulator have resulted in a higher level of compliance in this area. The Audits are to ensure the correct pipework including the backflow prevention device is installed and the system is hydrostatically tested at 1700Kpa for a period of two hours.

Following the audit the contractor must submit a plan of the work carried out along with a Certificate of Compliance to the OTR. This information is then forwarded to the Metropolitan Fire Service who then conduct a flow test of the system.



Figure W12: Fire Service Installation with Backflow Prevention Device

16.5.2. Example of a variation to a fire hydrant booster

Fire hydrant booster assemblies can vary depending on the requirements for a particular site. The Technical Regulator conducts sample audits of these installations to ensure they comply with the appropriate Standards. An example of a combined fire and sprinkler service connected within the booster assembly installed with compliant valves is shown in Figure W13.



Figure W13: Variation to a standard fire hydrant booster service

There are several aspects of this combined fire booster which have been designed to comply with the performance requirements of the NCC. The installation includes a WaterMarked testable backflow prevention device on the inlet or upstream side of the connection to the Water Entities supply. The feed hydrant riser is constructed of copper which is compliant with AS/NZS 4020 the Standard for “Materials in contact with drinking water”.

All valves in the combined booster assembly are required to be WaterMarked, including the backflow prevention full flow, non-return and isolating valves.

16.6. Cross-connection Control and Backflow Prevention

The role of the Technical Regulator is to ensure drinking water and non-drinking water service installations meet the performance requirements of the National Construction Code Volume Three. The Technical

Regulator's Cross-Connection Backflow Prevention Program is the primary method of ensuring that testable backflow prevention devices are installed to protect the integrity of the drinking water supply.

The National Construction Code Volume 3 specifies the performance requirements for drinking and non-drinking water systems. AS/NZS 3500.1 is the deemed-to-satisfy provisions for ensuring the performance requirements are achieved.

AS/NZS 3500.1 defines a cross-connection as any connection or arrangement, physical or otherwise, between any drinking water supply either directly or indirectly connected to a water main, and any fixture, storage tank, receptacle, equipment or device through which it may be possible for any non-drinking water used, unclear, polluted or contaminated water, or any other substance, to enter any part of a drinking water supply.

For example, a cross-connection in a residential house can be described as a connection between a household drinking water supply and a contaminated source such as an unprotected irrigation system where pesticides or fertilizers can enter the drinking water system or the installation of douche toilet seats without appropriate backflow prevention devices being installed.



Figure W14: Douche seat installation with compliant backflow prevention

The Technical Regulator maintains a register of over 30,000 backflow prevention devices installed on drinking water services throughout South Australia. Each device is registered on the system when it is installed and a reminder letter is sent to the property owner each year to have the device retested to ensure the device is functioning correctly. Audits of backflow prevention devices are undertaken to ensure they are installed in accordance with the National Construction Code Volume Three and associated Standards.

Use of non-drinking water for irrigation purposes

The use of non-drinking water for irrigation of municipal parks and gardens, sports fields and school ovals has significantly increased over the last few years. The primary reason for the increased uptake of non-drinking water for such usage is sustainability and the efficient use of an alternative, cost-effective product. The availability and uptake of non-drinking water for irrigation has led to increased regulatory involvement of the Technical Regulator to ensure the ongoing safety in both plumbing and broad-scale irrigation systems.

The Technical Regulator has established a technical procedure to ensure that inter-connections between drinking and non-drinking water supplies are installed with appropriate backflow prevention devices. This requirement has been articulated through a number of communication sessions with industry (see Section 16). Ongoing communication has focused on engaging directly with industry stakeholders to ensure compliance measures are adhered to.

16.7. Property Interest Reporting and Data Management

16.7.1. Property interest reporting

The Technical Regulator is required to disclose required information on the sale or change of ownership of a property under Section 12 of the *Land and Business (Sale and Conveyancing) Act 1994*, Regulation 16 of the *Land and Business (Sale and Conveyancing) Regulations 2010* and Regulation 12 of the Regulations. The Technical Regulator provides interested persons with information relating to encumbrances registered against a particular property. These encumbrances are comprised mostly of Backflow Prevention Devices (which require annual maintenance) and general non-compliant plumbing work.

The Technical Regulator receives daily correspondence from the Land Services Group (LSG) relating to the sale, potential sale or change of ownership of a property. The Technical Regulator is required to respond to the interested party within seven days.

16.7.2. Encumbrances

The Technical Regulator places a Notice of Advice on a property where plumbing audit results confirm a serious technical or safety issue associated with the on-site plumbing or where a backflow prevention device has been installed in connection with a drinking water service. Approximately two thirds of encumbrances held by the Technical Regulator relate to backflow prevention devices. The remaining encumbrances relate to non-compliant plumbing and drains crossing boundaries. These encumbrances are registered on the South Australian Integrated Land Information System (SAILIS) which is operated by the Department of Planning, Transport and Infrastructure. An encumbrance will remain on a property until the plumbing work is made compliant or the Backflow Prevention Device is no longer required.

16.7.3. Self-management of testable backflow prevention devices

The Technical Regulator has implemented a policy for the management of testable backflow prevention devices located on State Government and local Council properties. The policy allows State Government and local Councils to manage the testing and maintenance of their own backflow prevention devices. This change accords with the State Governments Red Tape Reduction Initiative.

Following consultation with several local Councils, the Technical Regulator saw an opportunity for customers to reduce administrative costs and produce a maintenance schedule suitable to their specific needs. Most Government departments and local Councils already maintain appropriate databases which made resubmitting details to the Technical Regulator repetitive and time consuming. The objective of the policy was to simplify administrative requirements for Government Agencies, local Councils and the Technical Regulator through a reduction of reporting requirements associated with testable backflow prevention devices maintenance. The Technical Regulator has approached relevant customers individually and worked collaboratively with them to promote self-management of their Backflow Prevention Device test records. Instead of sending all test records to the Technical Regulator at the time of testing, Government Agencies and local Councils will manage their own backflow devices. The Technical Regulator will conduct desktop and site audits at pre-determined intervals throughout the year to ensure compliance.

The response from customers has been overwhelmingly positive. One local Council wrote to the Technical Regulator stating that the 'benefits for Council are quite significant' and was appreciative of the Technical Regulator in recognising them as a suitable candidate for the introduction of the self-management project. One of the key requirements of implementing the Self-Management system is that the government department or local Council has no backflow devices that are delinquent or overdue for retest. The strong desire to self-manage is encouraging customers to keep all devices appropriately maintained.

There are currently two local Councils and the New Royal Adelaide Hospital on the Self-Management System. The Technical Regulator is also assisting three additional local Councils with their transition to self-management and is exploring the possibility of getting all public school properties to self-manage. This is currently being negotiated with the Office of the Minister for Education and Child Development.

BACKFLOW MANAGEMENT TEMPLATE										
Date Commissioned	Date re-tested	Date removed	Device Type	Device Serial Number	Bar Code Number	Device Name	Device Model	Device Size	Protection Type Level	Device location or GPS Co-ordinates
3/06/16			DCV	851585		ValvCheQ	DC03	25	ZONE	ADJ WATER METER NORTH END OF RESERVE
	8/06/16		DCV	515871		WILKINS	350	80	CONTAINMENT	LEFT SIDE OF MAIN GATE AT WATER METER
	8/06/16		DCV	548625		WILKINS	950	40	INDIVIDUAL	IN FRONT OF HYDRANT RHS OF OFFICE CAR PARK
	9/06/16		DCV	958742		WILKINS	350	80	CONTAINMENT	RIGHT SIDE OF ENTRANCE GATES ON METER
		13/06/16	RPZ	364255		TYCO	RP03	50	ZONE	ADJACENT WATER TANK & WORKSHOP
	21/06/16		RPZ	995682		FEBCO	RPZ	50	CONTAINMENT	EAST WING SLUICE ROOM
	21/06/16		DCV	554865		TYCO	DC03	50	Containment	OPPOSITE SHED NEAR WATER METER
	21/06/16		DCV	215468		FEBCO	850L	50	Zone	SOUTH EAST CORNER NEAR WATER TANK

Figure W15: Example of a section of a backflow management template

Section 17: Consumer Safety Awareness

17.1. Plumbing advisory notes

The Technical Regulator produces advisory notes to help people working in the plumbing industry interpret the requirements for on-site plumbing installations. Those notes are available on the website and refer to specific issues such as hydraulic submission applications, bath waste connections, legionella risk management, etc.

17.2. Training Sessions for Water and Plumbing Industries

Regular training, consultation and information sessions are conducted with the water and plumbing industries.



Figure W16: Training session conducted by the OTR plumbing section at Tonsley TAFE.

The Technical Regulator uses these training sessions as an opportunity to discuss and clarify changes to regulatory Standards and practices. Examples of training session topics include:

- Updates on changes to National Construction Code Volume 3 – Plumbing Code of Australia (PCA);
- Updates to the AS/NZS 3500 Plumbing and drainage Standard series which include Water Services, Sanitary Plumbing & Drainage, and Heated Water Services;
- Release of Guidelines for Non-drinking Water in South Australia;
- Technical issues such as sanitary drainage, non-Drinking Water installations, Legionella Control, Fire Service installations, Backflow Prevention for irrigation systems and WaterMark compliance.

The Technical Regulator has strong relationships with the following groups and is regularly engaged to conduct or attend information sessions:

- Plumbing Industry Reference group (TAFE SA)
- Master Builders Association Technical Committee
- Water Industry Technical Advisory Committee
- Master Plumbers Association of SA Inc.
- Peer Training Reference Group
- Training Prospects Reference Group
- Backflow Prevention Association of Australia
- Fire Industry Association (FIA)
- Metropolitan Fire Service (MFS)
- Country Fire Service (CFS)
- Building Consultants Forum
- Aust. Hydraulic Association SA Chapter
- Department of Health and Ageing
- The Commission
- Planning SA
- Backflow Prevention Association of Aust.
- Australian Building Codes Board
- Local Government Association of SA
- Regional Local Government Groups
- Wastewater Special Industry Group (Environmental Health Officers)
- Water Industry Alliance (WIA) – MARHub and WaRDA
- Australian Water Association (AWA)

Master Plumbers Association of South Australia Inc. (MPA)

The Technical Regulator consults with the MPA on a regular basis and has utilised their forum to improve plumbing regulation including conducting presentations at their regional and local Roadshows. The Technical Regulator has also collaborated with the MPA to actively address regulatory issues, licensing matters, the new Electronic Certificate of Compliance project and continuing professional development. The Technical Regulator provides regular articles for the MPA's Plumbing SA newsletter and is represented on the MPA selection panel for the Plumbing Gold Medal Award which is presented annually to the Apprentice of the Year.

Association of Hydraulic Services Consultants Australia (South Australia) (AHSCA)

The Technical Regulator actively engages with members of the AHSCA and seeks their input into proposed amendments to the Plumbing Code of Australia and associated Standards. Attendance at meetings provides the Technical Regulator with the opportunity to clarify issues as they are presented. The Technical Regulator has conducted presentations on non-drinking water and fire service installations.

Wastewater Special Industry Group (Environmental Health Officer)

The Wastewater Special Industry Group comprises predominately of Environmental Health Officers (EHO's) and SA Health Officers who monitor on-site waste water treatment systems. The Technical Regulator provides updates on the National Construction Code Volume 3 and associated Standards. Presentations have been made on the Electronic Certificate of Compliance project and the as-constructed drainage plan project. The Technical Regulator engages with EHO's in regional areas and provides training on regulatory and on-site plumbing requirements. Training has been provided for EHO's in the South East Region, York Peninsula and Kangaroo Island.

The Plumbing Industry Reference Group (PIRAG)

PIRAG is an Industry Reference Group formulated within TAFE SA. PIRAG members represent various sectors of the plumbing industry including the Technical Regulator, MPA, Plumbing Contractors, the Construction Industry Training Board, manufactures and apprentice providers.

The committee meets quarterly to discuss matters that affect the training of apprentices which includes discussion on the following topics:

- E-Learning
- Licensing matters
- Training and information sessions conducted to staff and students by the Technical Regulator
- Continual professional development
- Reporting on the training package
- Quality and Industry Validation
- Training Gaps
- Business Development
- OHS&W

Building industry technical advisory committees

The Technical Regulator has involvement with the Master Builders Association (MBA) and the Housing Industry Association (HIA) technical committees. The Technical Regulator is represented on these technical committees for the purpose of keeping them informed of changes to plumbing regulation in South Australia.

SA Water Industry Regulators

The Technical Regulator has operational agreements and Memoranda of Understanding (MOUs) with key intra-government water regulatory agencies. These agreements and MOUs are intended to promote a streamlined regulatory process for the water industry by working with other government agencies to optimise each agency's regulatory input. Furthermore, the Technical Regulator has been fundamental in the development of an intra-government water regulatory consortium, where agencies are able to share key information about their current operations and any impacts of the water industry and/or other agencies. The water agencies involved in this consortium are:

- Office of the Technical Regulator;
- Department for Environment and Water;
- Essential Services Commission of South Australia (the Commission);
- Department for Health and Wellbeing;
- Environment Protection Agency (EPA).

Section 18: Water and Plumbing Regulatory Coordination

18.1. Technical Standards

The Technical Regulator provides expert has the power to publish Standards relating to infrastructure or equipment that is used, or is capable of being used, in the water industry under sections 66 of the *Water Industry Act 2012*.

18.1.1. Water and Sewerage Infrastructure Technical Standards

To date, the Technical Regulator has not published a technical Standard which is applicable to water and sewerage infrastructure.

Water Services Association of Australia (WSAA)

The Water Services Association of Australia (WSAA) has developed National Codes (WSAA Codes) for the urban water industry detailing performance requirements for design, installation, inspection, alteration, repair, maintenance, removal, disconnection or decommissioning of water and sewerage infrastructure. The WSAA Codes have been widely adopted by water utilities across Australia and the water industry. The WSAA Codes allow for water industry entities to make appropriate modifications (where necessary) to accommodate their needs and preference as well as local construction practices and products.



Figure W17: Water Services Association of Australia (WSAA) National Codes

The Department for Health and Wellbeing, Local Government Association and Environment Protection Authority also have technical Standards, codes and guidelines for the water industry, in particular related to the design and installation of CWMS.

The Technical Regulator has identified the WSAA Codes, and any technical Standard, code or guideline stated in legislation as suitable Standards for the South Australian water industry. These codes, Standards and guidelines are referenced during the review and approval of water industry entities' SRMTMPs, and for the provision of advice in relation to safety or technical matters to the water industry.

If an alternative Standard is proposed, it is necessary for the water industry entity to identify all potential risks, and develop associated mitigation measures and approaches to reduce or eliminate the relevant risks. Following the receipt of this information, the Technical Regulator will then determine whether the alternative approach adequately meets the required performance outcome.

18.1.2. Plumbing Technical Standards

The Technical Regulator has published a Plumbing Standard under section 66 of the *Water Industry Act 2012* that provides the basis for calling up the relevant sections of the National Construction Code (NCC) Volume 3 – Plumbing Code of Australia (PCA) (see Appendix 2).

National Construction Code Series (NCC)

The NCC is an initiative of the Council of Australian Governments (COAG) developed to incorporate all on-site construction requirements into a single code.

The NCC is model regulation developed by the Australian Building Codes Board (ABCB) and takes effect through legislation of the states and territories which administer and enforce building and plumbing regulation.

Building regulation is covered in Volumes 1 and 2 – the Building Code of Australia (BCA). Volume 3 covers plumbing regulation – the Plumbing Code of Australia (PCA).

Australian Building Codes Board and Plumbing Code Committee

The Plumbing Code Committee (PCC) is the ABCB’s peak plumbing technical advisory body. The PCC is a valuable national forum through which regulatory authorities and industry consider technical matters relevant to plumbing regulatory reform and plays an active role in assisting the Board in meeting its obligations under the COAG Guidelines and the Inter-Government Agreement.

The PCC operates in alignment with the ABCB’s Building Codes Committee (BCC) to ensure a coordinated approach to building and plumbing regulatory reform. The Technical Regulator regularly provides agenda items for discussion at PCC meetings. Issues including sanitary drainage, non-drinking water, fire service installations and water services have been presented to the committee with recommendations for amendments to the Plumbing Standards.

The NCC Series is drafted in a performance format allowing a choice of Deemed-to-Satisfy Solutions or the flexibility to develop Performance Solutions (refer to Figure W19).

One of the essential elements for introducing a performance mind-set is to re-educate the plumbing industry on the methods of achieving compliance by analysing the Performance Requirements against the standard Deemed-to-Satisfy Solutions and the Performance Requirements in the PCA.

The ABCB is undertaking a project to quantify plumbing and drainage performance. The information gathered from this project will allow the ABCB to develop existing performance requirements set out in the PCA into simpler, more measurable expression. The resulting performance requirements will be included in the next PCA edition due to be published in 2019.

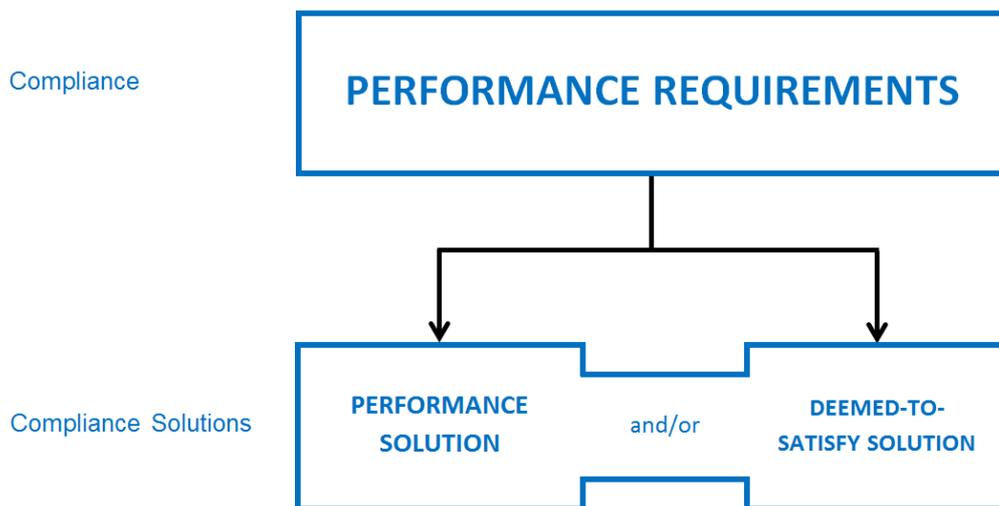


Figure W19: NCC Compliance Structure

WaterMark Certification Scheme

The WaterMark Certification Scheme is a mandatory certification scheme for plumbing and drainage products to ensure that plumbing and drainage materials and products are fit for purpose and appropriately authorised for use in plumbing installations. The WaterMark Scheme is administered by the ABCB; the PCC, as the primary plumbing technical advisory committee, is regularly engaged to comment on changes to the Scheme.

The ABCB released a new improved WaterMark Scheme on 1 July 2016. The new WaterMark Scheme Product Database has also been published on the ABCB's website. This database is based on a single material and product certification level (where previously there were 2 levels of certification).

The aim of the revised Scheme and data base is to streamline requirements, processes and enforcement creating a reliable, consistent and level playing field for scheme participants and mitigating risks to the ABCB. This enables the scheme to deliver plumbing and drainage products that are safe and fit for their intended use in and around buildings in an environment that is increasingly challenged by reduced resources for enforcement, increased product non-conformity and an ever-expanding global market.

AS/NZS 3500 Plumbing and Drainage Standard

Standards Australia has recently updated the following sections of the AS/NZS 3500 Plumbing and drainage Standard:

Revision of AS/NZS 3500 series:

- Part 1 Water services (version published 30th June 2015)
- Part 2 Sanitary plumbing and drainage (version published 30th June 2015)
- Part 4 Heated water services (version published 14th December 2015)
- Part 5 Housing installations (updated version yet to be published)

The AS/NZS 3500 Plumbing and Drainage Standard Series is prepared by Standards Australia to provide plumbers with Deemed-to-Satisfy Solutions to comply with the Performance Requirements of the PCA. The WS-014 Committee assists Standards Australia in the administration of the AS/NZS 3500 Series. This committee includes representatives from industry and state and territory plumbing regulatory administrations.

18.1.3. OTR Guidelines

Non-Drinking Water Guidelines

The Technical Regulator released non-drinking water guidelines namely, Guidelines for Non-drinking Water in South Australia. The guidelines were developed for the water and plumbing industries and are applicable to all non-drinking water installations in South Australia.

The guidelines are presented in three parts and outline requirements and responsibilities for installing, operating and maintaining non-drinking water systems in accordance with the *Water Industry Act 2012*, the Regulations, and appropriate technical Standards, and will be used by the plumbing and water industries, water industry entities and property owners with a non-drinking water supply.

18.2. Committee Representation

The Technical Regulator provides expert technical input for the revision of key Standards through representation of the following Standards committees:

<i>ABCC</i>	<i>Australian Building Codes Plumbing Codes Committee</i>
<i>WS-014</i>	<i>Plumbing and Drainage Standard – Part 1 – Water services</i>
<i>WS-014</i>	<i>Plumbing and Drainage Standard – Part 2 – Sanitary plumbing and drainage</i>
<i>WS-014</i>	<i>Plumbing and Drainage Standard – Part 4 – Heated water services</i>
<i>WS-039</i>	<i>Mirror Committee for ISO/TC 275 - Sludge recovery, recycling, treatment and disposal</i>
<i>WS-041</i>	<i>Mirror Committee for ISO/TC 224 – Service activities relating to drinking water supply systems and wastewater systems - Quality criteria of the service and performance indicators</i>

Appendix 1: OTR Activity Report – 2018-19

This is an activity report that describes the operations of the Technical Regulator in the Electrical, Gas, Plumbing and Water industries over the 2018-19 financial year.

The Technical Regulator is a statutory office established by:

- Section 7 of the *Electricity Act 1996*. Robert Faunt has held this office since he was appointed as the Technical Regulator under the *Electricity Act 1996* on 28 February 2003.
- Section 7 of the *Gas Act 1997*. Robert Faunt has held this office since he was appointed as the Technical Regulator under the *Gas Act 1997* on 28 February 2003.
- Section 8 of the *Water Industry Act 2012*. Robert Faunt has held this office since he was appointed as the Technical Regulator in 2012.

Robert Faunt has held this office since he was appointed as the Technical Regulator under the *Electricity Act 1996* and the *Gas Act 1997* on 28 February 2003, and since he was appointed as the Technical Regulator under the *Water Industry Act 2012* in 2012.

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The Office of the Technical Regulator

Section 1: Overall Activity

1.1. Electronic Certificate of Compliance (eCoC)

Certificates of compliance are an instrument used to demonstrate that an installation is compliant and can be used by a property owner to demonstrate that they have met their duty to ensure that their property is safe. The electronic certificate of compliance (eCoC) system was launched for registration only in August 2016 and for the creation and submission of eCoCs in January 2017. Following an 18-month transition; paper certificates were discontinued on 30 June 2018. Usage of eCoCs rose sharply after 30 June 2018, while new registrations peaked in June and July 2018.

Submission rates are now in line with the volume of paper certificates which were printed previously and given there was some wastage of paper certificates this is indicative of increased levels of compliance. The vast majority of eCoCs relate to electrical work, and the Technical Regulator now receives around 25,000 of these each month. Plumbing and gas work generates fewer certificates, around 2,000 and 3,000 each month respectively.

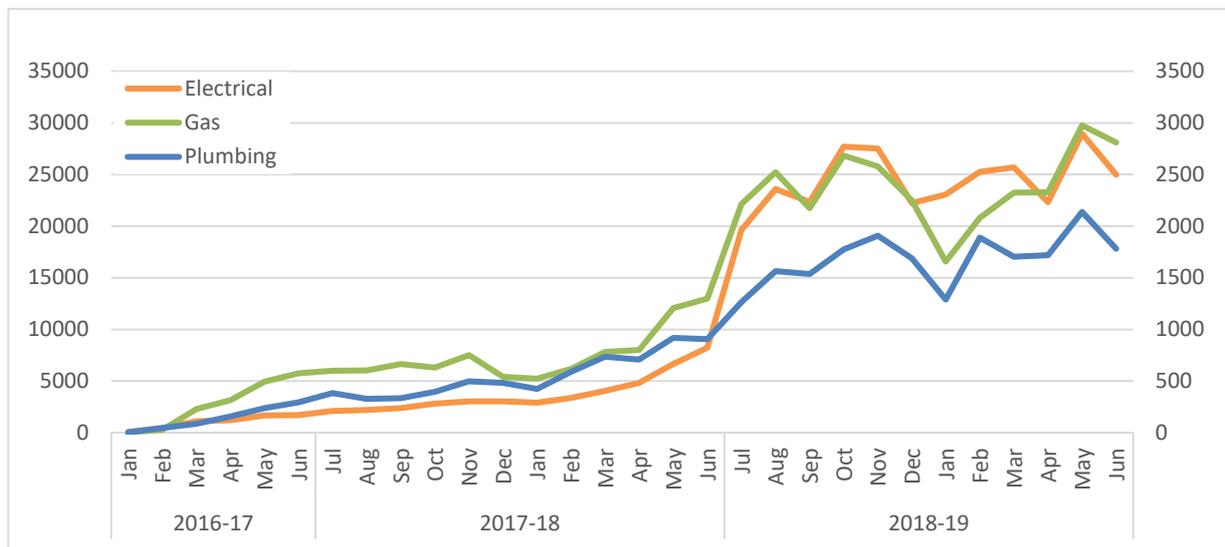


Figure 1: Electronic Certificate of Compliance Submission Rates by Industry

The eCoC is free of charge and is available on a range of devices, allowing tradespersons to complete the form on site using their smartphone, tablet or computer.

Table 1: Electronic Certificates of Compliance statistics as of 30 June 2019:

		Electrical	Gas	Plumbing	Total
Submitted eCoCs	2017-18	45,625	9,019	6,703	61,347
	2018-19	293,244	28,591	20,251	342,086
	Total eCoCs	345,079	39,255	27,782	412,116
New Licences Registered	2017-18	4,874	1,483	1,530	5,453
	2018-19	4,609	1,380	1,425	5,195
	Total Licences	11,158	3,438	3,558	12,535

Note that many licences permit the holder to work in several industries, and so these licences contribute to the figures in several industry columns but are counted only once in the total.

1.2. Emergency Management

In terms of significant events in 2018-19, on 24 January 2019 Adelaide and many sites in South Australia saw new record maximum temperatures (Adelaide recorded a new all-time maximum of 46.6°C). The Australian Energy Market Operator (AEMO) activated the Reliability and Emergency Reserve Trader scheme in South Australia, and the Minister declared an Electricity Supply Emergency under the *Emergency Management Act 2004* to issue directions to assist in avoiding load shedding in the general community. The Technical Regulator has well-developed relationships with AEMO, other jurisdictions, and other bodies such as the Bureau of Meteorology to help facilitate information flows and maintain situation awareness in relation to power system issues.

The Technical Regulator is capable of monitoring the National Electricity Market in real time, receives information from AEMO at least weekly in relation to supply and demand projections, and reports on the status of the power system weekly. The Technical Regulator also monitors the natural gas and liquid fuel industries and prepares regular periodic reports on the state of these industries and supply levels.

Staff from the Office of the Technical Regulator have also participated in multiple emergency management exercises over the last twelve months. These exercises have encompassed issues with the electricity, natural gas, or liquid fuel industries, as well as cyber security and counter-terrorism scenarios.

1.3. Consumer Safety Survey

For 2018-19, the Consumer Survey key outcomes were:

- 80% of the survey respondents agreed they were aware of the dangers of Carbon Monoxide (CO);
- Amongst those who had work done in their property in the last two years: 96% were aware that the person undertaking the job should be licensed and qualified; 72% said they received proof that the person was licensed and qualified; 64% were aware they should receive a certificate of compliance when work is done; and 55% received one when they had a job done.
- About 22% of the public are buying appliances online (mainly electrical appliances) – this number is similar to previous years, highlighting that most appliances are bought in physical stores;
- The top three messages that survey participants recalled seeing or hearing were: the importance of reporting gas leaks (36%); requirements for tradespersons to be licenced (36%); and dangers posed by Carbon Monoxide (32%). Those results are similar to previous years although the percentage of communications being recalled is overall slightly lower than in previous years.
- Overall, online respondents seem to have lower awareness regarding energy safety than indicated by previous surveys, most likely as online respondents are skewed younger than phone survey CATI respondents.

The results obtained were consistent with the last two years, pointing out that safety attitudes and behaviours may be influenced by demographic factors. Some results suggest that there may be a need for improved visuals to increase the recall in messages. The Technical Regulator will take this feedback into account in designing the next safety campaign.

Volume I - Electricity Industry

Section 2: Electrical Infrastructure

3.1. Audits by the Technical Regulator

3.1.1. SRMTMP field audits

BHP Billiton and Roxby Downs electricity networks, together with their water supply operations were audited in 2018-19. An electricity generation and distribution SRMTMP audit of Jeril Enterprises was also conducted. Port Pirie Solar has been audited and preparation for other solar farm audits was completed.

The areas audited included:

- Training systems;
- Contractor management;
- Isolation practices;
- High voltage switching;
- Control systems, security and interdependencies with other Infrastructure;
- Accident investigation and reporting; and
- Maintenance management systems

Overall, no evidence was found that would indicate that the entities do not generally comply with the processes listed in their respective SRMTMPs.

3.1.2. BHP Billiton distribution and transmission network site audit

The Technical Regulator conducted an SRMTMP site audit on 3 April 2019 at Olympic Dam. The BHP Billiton SRMTMP covers 275 kV transmission line infrastructure between Davenport substation and Olympic Dam and 132 kV to the ElectraNet Pimba substation. Distribution infrastructure to the Roxby Downs town substation and Olympic Dam Village external customers is also addressed.

As BHP Billiton is a large organisation, the Olympic Dam electricity transmission and distribution operations are supported by many levels of management and procedures.



Figure E1: Roxby town substation

3.1.3. Municipal Council of Roxby Downs distribution site audit

The Technical Regulator conducted a site audit of Roxby Downs council electricity distribution SRMTMP on 4 April 2019.

Enerven, a SA Power Networks company, is contracted to conduct high voltage operations on the Roxby Downs distribution network. BHP Billiton is responsible for high voltage switching in the Roxby town substation.

A new work health and safety manager has been employed by Council to review and implement improvements to Council systems, including transferring training and risk management to the Skytrust system.

3.1.4. Jeril Andamooka Powerhouse site audit

Jeril Enterprises operate the Andamooka powerhouse and distribution network. The audit on 5 April 2019 was the first visit to Jeril Enterprises from the Technical Regulator. The Technical Regulator took the opportunity to listen to the operator relay the challenges of the remote area operation not connected to the National Electricity Market network—both technical and with the local community. The Technical Regulator was able to advise about electricity incident statutory reporting requirements, including the newer requirement for reporting of fires caused by the infrastructure that emergency services attend, and together with OTR electrical installations officers, will continue to work with Jeril Enterprises on installation connection procedures.



Figure E2: Andamooka powerlines and switchgear

3.1.5. Mobilong solar farm

The Technical Regulator has conducted a site audit of Port Pirie Solar's Mobilong Solar Farm (near Murray Bridge).

This was the first audit of a medium sized – up to 5 MW – solar farm. Due to the rapid nature of construction of similar farms, the farm may be well advanced when the Technical Regulator becomes aware of the farm being issued a generation licence from ESCOSA. Mobilong solar farm helped accommodate our audit at short notice, however, solar farms that have applied for ESCOSA generation licences may be scheduled for audit in anticipation of receiving a licence. The Technical Regulator assisted

Mobilong solar farm in preparation of a SRMTMP and was able to advise the construction contractors about South Australian electricity incident statutory reporting requirements.

3.2. Generation

Changes were made to the Development Regulations in 2017 which prescribe all new proposed generator plants of greater capacity than 5 MW to seek approval from the Technical Regulator to ensure it meets certain technical requirements to contribute to power system security in South Australia.

Since 1 July 2017, the Technical Regulator has technical requirements that proposed generators must achieve to receive a certificate from the Technical Regulator and progress to the Development Application stage.

The Technical Regulator has worked closely with the industry since these requirements have been put in place, and numerous generator applications have received certificates from the Technical Regulator to date.

3.3. Transmission

Transmission Line Availability

The electricity transmission system transports power from the power stations directly to a series of substations and switchyards, which in turn supply the distribution system and directly connected transmission customers. The major transmission entity in the State, ElectraNet, owns and operates a network of approximately 5,680 circuit kilometres of transmission lines. The network operates at nominal voltages of primarily 275 kV and 132 kV with a smaller number of 66 kV lines. The transmission system also includes 91 substations and switchyards. Transmission line availability in 2018-19 was 98.9%. ElectraNet's Key Performance Indicators (KPIs) from its SRMTMP are listed in Table K1 in Volume IV.

3.4. Distribution

The distribution network delivers power to consumers. The major distribution network operator, SA Power Networks (formerly ETSA Utilities), owns and maintains over 89,300 kilometres of overhead and underground distribution lines. The lines operate at 132 kV, 66 kV, 33 kV, 19 kV (SWER), 11 kV, 7.6 kV and low voltage (400/230 V). SA Power Networks also owns 408 substations and switchyards.

The South Australian distribution network serves over 879,500 customers.

In 2018-19, fire starts attributed to distribution infrastructure showed a small decrease to 0.8 fire starts per 1,000 km of mains. SA Power Networks' KPIs are provided in Table K2 in Volume IV.

Reliability

The Bureau of Meteorology (BOM) advised of numerous severe weather events in 2018-19 of which many were categorised as Significant Weather Events (SWE), there were four days classified under the more severe category of Major Event Days (MEDs). Such events pose a major challenge for the reliability and management of the electricity distribution network.

The reliability indicator "Unplanned System Average Interruption Duration Index" (USAIDI) for the SA Power Networks' distribution system in 2018-19 was an average of 149.7 minutes per customer. This has increased slightly from 137 minutes per customer in the previous year.

The calculations for SA Power Networks' normalised USAIDI ¹ performance, (i.e. excluding significant weather events) in accordance with a modified IEEE (The Institute of Electrical and Electronics Engineers) Standard 1366 ² resulted in a state-wide USAIDI of 146.4 minutes.

The Technical Regulator is continuing to monitor SAPN's performance across all areas.

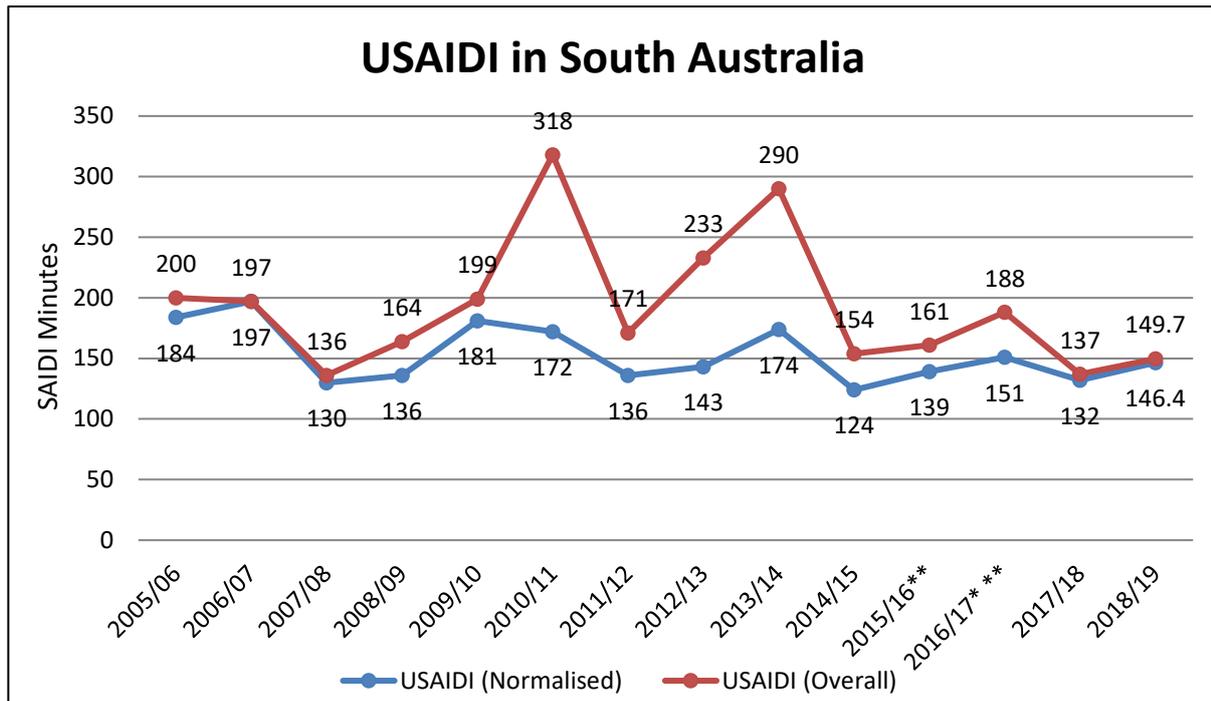


Figure E3: State-wide Unplanned SAIDI³ for SA (minutes per customer)

Note 1: From 1 July 2010 SA Power Networks reporting to the Regulator is based on Outage Management System (OMS) data (available from 1 July 2005). This includes a more accurate linking between the distribution system and customers' low voltage data and excludes planned interruptions. All years shown have been revised to reflect this change and to allow like-for-like comparison.

Note 2: SA Power Networks has excluded the major impact of significant weather events by excluding Major Event Day (MED) performance from the normalised performance. The MED is determined in accordance with the Australian Energy Regulator's (AER) Service Target Performance Incentive Scheme Guideline which mirrors the IEEE Standard.

Note 3: Includes unplanned interruptions on the high voltage and low voltage distribution network.

** The State-wide transmission outage (i.e. Black-start event) occurred on 28 September 2016 and is excluded from the above figures (as it was related to a transmission outage).

*** Excludes MEDs

Note 4: SA Power Networks is required to use its best endeavours to provide each customer affected by a planned outage (if > 15 minutes) with at least 4 business days' notice

SA Power Network also provides quarterly reports to the Technical Regulator which detail all major outages in the previous quarter.

Outage Causes

The two major causes of unplanned interruptions across the State during the 2018-19 regulatory period continued to be weather and equipment failure. Using the performance measure of SAIDI, these two causes accounted for 21% and 23% respectively of the interruptions in 2018-19.

SA Power Networks performance was generally relatively consistent with the previous years' performance (i.e. causes fall within the normally expected range). Outages due to third party factors retreated to the previous proportion of 8% while planned outages saw a small increase to make up 38% of the total. These changes are within the normal envelope and so do not raise any concerns.

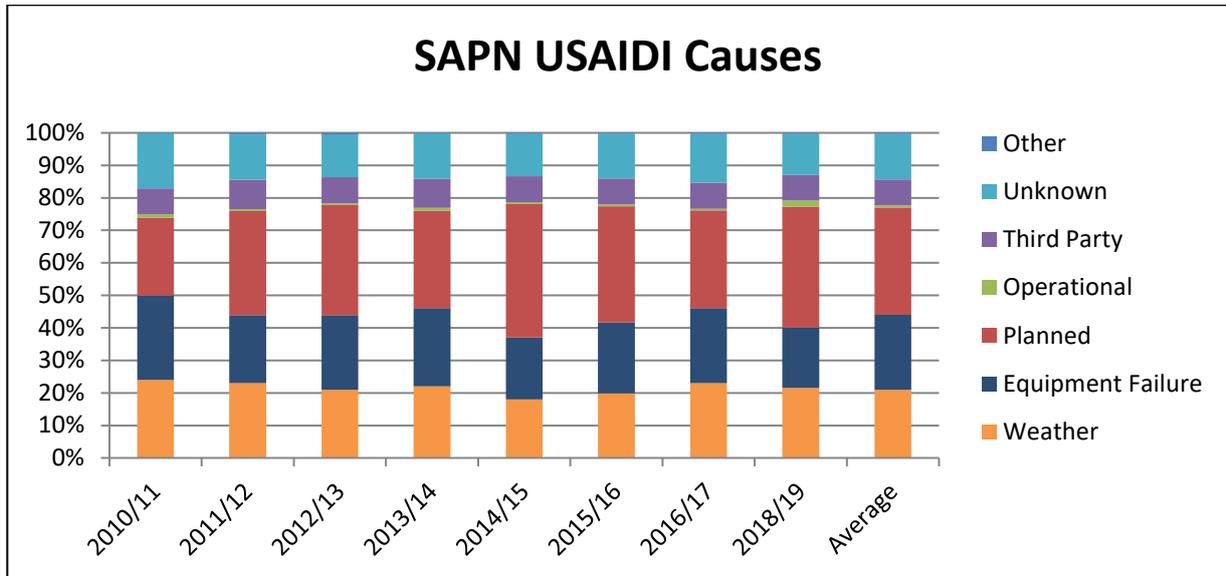


Figure E4: SAPN USAIDI Performance by Cause

3.5. Safety Clearances to Powerlines

3.5.1. Vegetation Clearance

Risks associated with Vegetation near Powerlines

No major fires in South Australia due to vegetation contacting the electricity transmission or distribution system were reported during 2018-19. SA Power Networks reported 0.8 fire starts per 1000 km of mains (see Table K2 – Volume IV) which is a small increase from the previous year.

Vegetation Clearance Objections

During the year, the Technical Regulator assisted with six objections and numerous complaints regarding vegetation clearance issues. In all cases, a mutually acceptable outcome was achieved.

Exemption to Planting Restrictions

The *Electricity (Principles of Vegetation Clearance) Regulations 2010* list species of vegetation that may be planted under or in proximity to powerlines. The selected species are not expected to exceed a certain height or encroach into the buffer or clearance zone.

In some instances, the Technical Regulator may allow non-listed vegetation to be planted in proximity to powerlines. This is done through a conditional exemption from planting restrictions. The conditions generally specify the minimum safety clearance between vegetation and powerlines and put an obligation on the exemption recipient to maintain these clearances at all times.

Table E1: Planting Restriction Exemptions for 2018-19

Exemptions submitted through SA Power Networks	0
Exemptions submitted through ElectraNet	0
Transfer of existing exemptions to new land owners	1
Exemptions removed	2

3.5.2. Building and Working Clearances

Building Clearance Approvals

The Technical Regulator is responsible for granting approvals under Section 86 of the *Electricity Act 1996* for the erection of buildings in proximity to powerlines.

Any requests for approval to build within the prescribed safety clearance area are assessed individually, by means of a risk assessment which takes into consideration the safety of building construction and maintenance as well as the finished building. Seventeen approvals were granted in 2018-19.

Equipment contacting overhead powerlines

Twenty-nine incidents involving contact of equipment with powerlines were reported to the Technical Regulator in 2018-19. This compares with 24 in the previous year.

Section 4: Electrical Installations

- 1,172 electrical installations were audited for compliance with the *Electricity Act 1996* and associated regulations. Audited installations were randomly selected from lists of new connections supplied by the distribution network service provider, SA Power Networks, and other network operators. Other installations were targeted for audits due to complaints or a history of non-compliance.
- OTR officers assisted South Australia Police on 208 occasions, including attending illegal cannabis growers' premises where dangerous wiring, including meter bypasses, were suspected. Power was disconnected for installations deemed immediately dangerous until they could be rectified by a licensed electrician. Some of these requests for assistance by South Australia Police were to help investigate the fatalities that may have been the result of an electric shock, while others were to attend and disconnect the electricity so that their investigations could proceed safely.
- A total of 31 expiations were issued and six electrical contractors were referred to Consumer and Business Services for breaches of the *Plumbers, Gasfitters and Electricians Act 1995*. In the case of owner/occupiers of premises, there were eight expiations issued against them for failing to maintain their electrical installation to an acceptable safe level.
- There were 21,514 enquiries for interpretations or technical advice in relation to the electrical installation standards, from industry stakeholders, government departments and members of the public.
- One electricity related death was reported, which was attributed to a homeowner removing components from a disused electrical appliance and then assembling their own homemade appliance. Unfortunately, in the process the victim contacted exposed live electrical connections. There were 11 electricity related major/minor incidents involving injury or significant damage (mainly solar or drug related hydroponic fires). A total of 1,079 electric shock reports were made to the Technical Regulator.

Section 5: Electrical Products

The Technical Regulator monitors suppliers of electrical appliances and accessories for compliance with the *Energy Products (Safety and Efficiency) Act 2000*. A certification service assists the industry to meet compliance obligations. A total of 127 applications for product approval were processed and 16 product related incidents were investigated. As a result, two voluntary recall notices were issued following negotiations with the suppliers.

Section 6: Consumer Safety Awareness

To help maintain a good safety record within the industry and to promote public awareness, the Technical Regulator:

- Attended industry events to discuss safety and compliance issues with electrical contractors. A total of 120 presentations were delivered, covering legislation and AS/NZS 3000 Wiring Rules and related Standards, the introduction of electronic certificates of compliance, changes to solar photovoltaic (PV) installation Standards, and reports on accidents and fatalities. Safety and technical presentations were also delivered to apprentices, industry groups and government departments.
- Attended home building expos and the Caravan and Camping Show to promote electrical safety, and answer queries from the public.
- Conducted 18 presentations on the requirements for building structures and shared information about working safely near powerlines with building industry companies and local councils. OTR engineers frequently made site visits to ensure safety and regulatory compliance.
- Continued the “Be Energy Safe” campaign, with advertisements in print and other media to support specific campaigns, warnings and recalls.
- Provided safety brochures on request to local Councils, electricity entities and the general public.

Published two editions of the *Regulation Roundup*, focussing on the Wiring Rules and other electrical Standards, solar PV installations and safe working practices. Copies were posted to electrical workers and contractors registered in South Australia. The publication is also available online for general access.

Volume II - Gas Industry

Section 7: Gas Infrastructure

7.1. Utilisation of Natural Gas Industry in South Australia

Natural gas is delivered to the State from Moomba (SA), and Queensland via the Moomba to Adelaide Pipeline and from Victoria via the Port Campbell to Adelaide Pipeline. A large percentage of this gas is used for power generation with the remainder being provided to networks. The following table shows the amount of gas delivered to the State. About 63% of gas delivered in SA was used in generating electricity in 2018-19 similar to the year before (64%).

Table G1: Overview of natural gas delivered to the State

Financial Year	Total amount of gas delivered to SA	Amount delivered for electricity generation	Amount delivered to networks
2017-18	103.8 PJ	66.6 PJ	37.2 PJ
2018-19	100.8 PJ	63.2 PJ	37.6 PJ
Variation	-2.9%	-5.1%	1.1%

In South Australia, natural gas is supplied from several sources and is transported to its destinations in the various transmission pipelines as indicated in Table G2 below.

Table G2: Overview of natural gas delivered to the State

Source	2015-16	2016-17	2017-18	2018-19
South Australia	24%	8%	13%	21%
Victoria	63%	62%	47%	43%
Queensland	13%	30%	40%	36%

Figure G1 shows the amount of gas being used in generating electricity in South Australia.

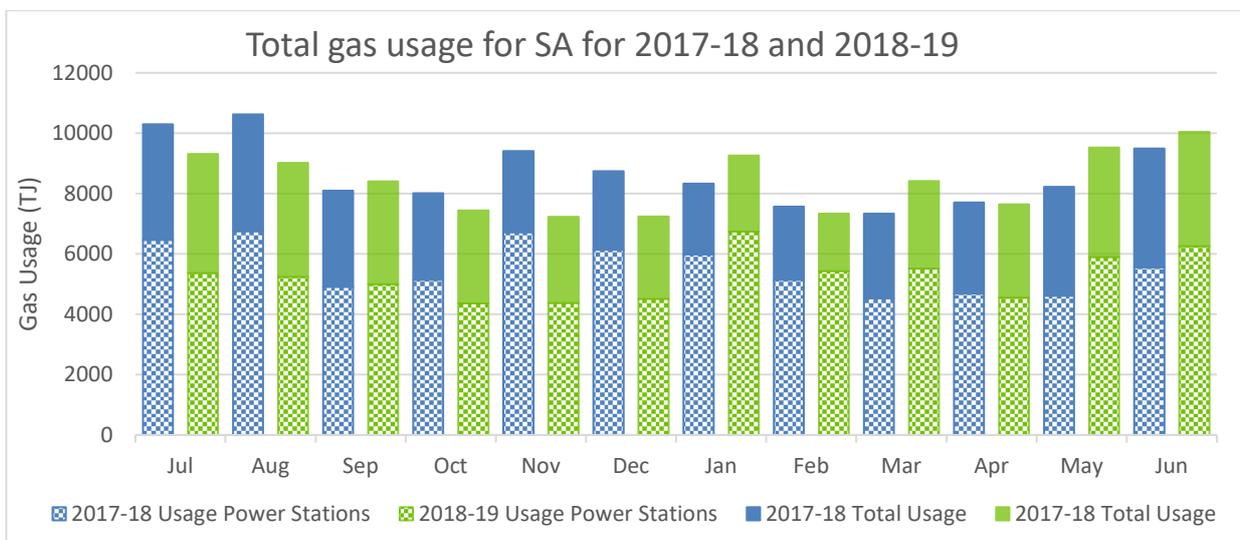


Figure G1: Total gas usage and usage for power generation in 2017-18 and 2018-19

Table G3: Annual quantity of gas entering AGN's SA networks (including Farmtaps)

Transmission pipeline	Gas Quantity (TJ) (1 July 2018 – 30 June 2019)
Moomba and QSN (MAP Gas)	18,680
SEA Gas	3,648
South East	472
Farmtaps	9,805
TOTAL	32,425

It can be seen from Figure G2 that the overall amount of gas supplied to the networks in 2018-19 is plateauing after 11 years of steady decline while the total number of consumers increased by 6,186 customers (1.4%) over the same period, with the distribution of consumers across the State demonstrated in Table G4 below.

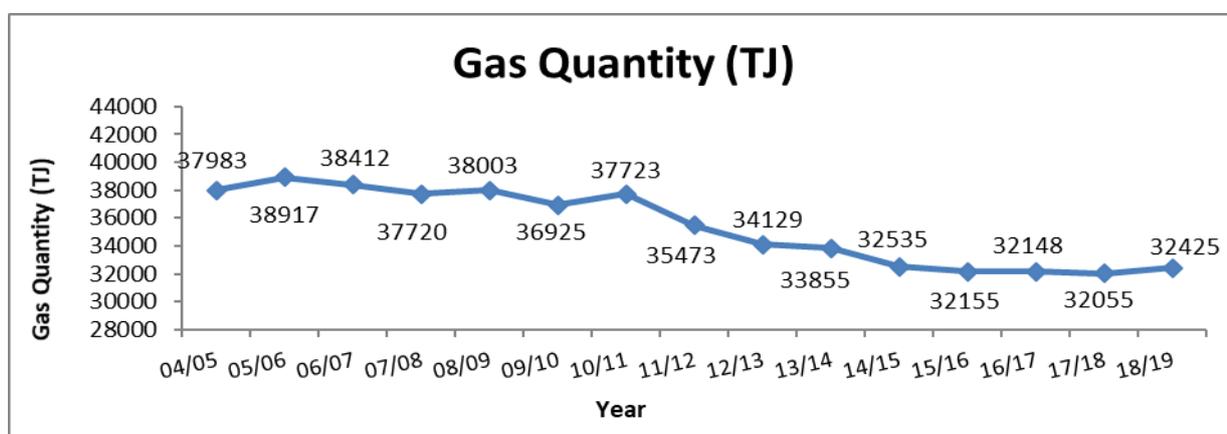


Figure G2: Trend in the quantity of gas entering the distribution system over the last 15 years

7.2. Natural Gas Infrastructure

The following table shows the number of consumers within the metropolitan and regional areas of SA.

Table G4: Approximate number of consumers in the natural gas distribution networks in South Australia

Network location	Consumers (as of 30/06/2019)
Adelaide (including Virginia, Waterloo Corner & Two wells)	432,747
Whyalla	4,200
Port Pirie	5,434
Mount Gambier	9,095
Peterborough	75
Nuriootpa	1,378
Angaston	365
Tanunda	236
Berri/Glossop	109
Murray Bridge	454
Freeling/Wasleys	323
Total	454,416

The number of consumers connected to natural gas has been steadily growing over the years.

In 2018-19, Enwave Tonsley Pty Ltd commenced the construction of the embedded natural gas distribution network at the new residential site at the Tonsley Innovation District. The embedded network is a reticulated natural gas network with a capacity to supply approximately 850 residential customers and 20 commercial customers. Gas would be supplied to the embedded network from the AGN natural gas distribution system via a non-pressure regulated metered supply point. Gas supply to the first residential customers would commence in July 2019.

In 2018-19, AGN outlined to the Technical Regulator the details of a blended 5% renewable gas project at the Tonsley Innovation Centre.

From mid-2020, 710 properties at the suburb of Mitchell Park, adjacent to the Tonsley Innovation Centre, will receive a blend of 5% renewable hydrogen with natural gas via the existing AGN gas distribution network. Blending hydrogen with natural gas helps to achieve a reduction of carbon emission because, when burned, hydrogen does not release any carbon emission (only water and heat) – so blended gas produces less carbon dioxide than 100% natural gas. The Technical Regulator outlined to AGN the safety, legislative and technical requirements which have to be achieved prior to the commencement of the operation of the hydrogen blended gas distribution network at Mitchell Park.

7.3. Safety of Natural Gas Infrastructure

In August 2018, APA Group submitted, on behalf of AGN, a revised Safety Reliability Maintenance and Technical Management Plan (SRMTMP). Discussions between the Technical Regulator and the stakeholders ensured that the SRMTMP met all the requirements of the legislation and the distribution licence, thereby safeguarding the interests of the community. The Technical Regulator approved the SRMTMP.

The Technical Regulator noted that the key performance indicators (KPIs) provided by AGN (see Table K3 in Volume IV) indicate that their distribution systems are generally in a sound condition and are being competently operated. There is some concern about the condition of the remaining cast iron (CI) and unprotected steel (UPS) mains and some classes of high density polyethylene (HDPE) mains within the network, which is being addressed through an asset monitoring and replacement program.

In May 2019, the Technical Regulator approved the Enwave Tonsley SRMTMP. This document relates to the design, construction, commissioning, management, operation, maintenance and decommissioning of the embedded natural gas distribution network located at the Tonsley Innovation Centre. The SRMTMP has been prepared to describe how Enwave's operations and maintenance staff ensure safe, reliable and sustainable management of the network. The Technical Regulator provided assistance to Enwave Tonsley in the development of the SRMTMP by outlining the legislative and regulatory safety and technical requirements, participating in the Formal Safety Assessment Workshops and monitoring of the construction and commissioning field activities.

7.3.1. Gas measurement management plan (GMMP)

In August 2018, AGN submitted a revised GMMP for 2018-19 which was recommended for approval to the Commission by the Technical Regulator. However, the Technical Regulator expressed concerns about the increase in the number of overdue gas meters compared to 2017-18.

Table G5: Overdue gas meters in 2017-18 and 2018-19

Overdue Gas Meters	With 10-year life	With 15-year life
As of July 2018	686	577
As of July 2019	1,205	1,268

AGN advised the Technical Regulator that increase in the number of meter's exceeding their initial 10- and 15-year life was due to:

- Access constraints: Home owners are becoming more focus on safety and security, and front and side yard gates are often locked preventing access. A program is underway to organise access to meters with home owners, residents, property managers that fall into this category.
- Process change: In late 2018, APA implemented a process change in the way meters approaching the end of their approved service life are identified. Based on the new methodology the Periodic Meter Changeover (PMC) is managed in real time with Asset Management System, not 12 months before their due date.

As these above issues have now been resolved, the number of overdue meters is likely to trend downward in the future

The Technical Regulator noted that AGN indicated that the measurement accuracy for the heating value determination was within the prescribed limits. The heating value is a measure of the energy being used and this must be provided accurately in the retailer's bill to gas consumers.

7.3.2. Auditing for safety and technical compliance

During 2018-19, the Technical Regulator carried out a series of desktop and field audits against AGN's SRMTMP and GMMP. These audits included a review of the following:

- Evidence of completion of outstanding corrective actions on all recommendations noted during the Technical Regulator's audit in 2017-18.
- Gas emergency response management system for Adelaide Metro and Regional Centres – review how APA would manage the processes to control an emergency condition arising in and from Adelaide Metro and Regional gas distribution networks, including the means and effectiveness of the communication process with various stakeholders.
- Review APA's training plans and practices and how they fit with the National Gas Industry Training Package and overall strategy towards APA's ageing work force/succession planning.
- Connection and commissioning processes for new and existing industrial, commercial and residential customer connections ('Meter Fix' process) - review contractors' and APA own operatives' roles, examination of contractor training and accreditation, APA's internal auditing of the connection practices (and accredited contractors), response time, commissioning completion and customer-builder satisfaction etc.
- Systems and procedures to fulfil APA's obligations with respect to installations, operations, maintenance and emergency preparedness of the regional gas distribution networks in Whyalla and Port Pirie.
- Materials and Components Control Process – review the processes that exist within APA to assess new materials for inclusion on the SA networks and how APA ensure that materials and components in the networks are fit for purpose e.g. pipes, valves, regulators etc.
- Leakage Management Plan (LMP) – following the organisational restructure of the APA Leakage Group in 2017 and the revision of the LMP in January 2018, review APA's resources and performance in ensuring APA's compliance with the appropriate leakage procedures, including the 'First on-site Response' procedure, and response timeframes to all class leaks in 2018-19.
- Distribution Mains and Services Integrity Plan (DMSIP) – review APA's compliance for 2018-19 (e.g. rates, resources, reporting, appropriate risk assessments etc.) with the approved mains replacement plan and preparation for compliance with the plan for the next 12 months (2018-19). Review the mains replacement prioritisation process. Review the impact of APA's mains replacement and other contributable factors, which are under control of APA, on the UAFG level over the last 12 months.

The Technical Regulator's audits carried out during 2018-19 found, in general, that the implementation of AGN's SRMTMP, DMSIP and GMMP (in the audited areas) were meeting the prescribed requirements from legislation, licence conditions, safety and technical Standards, and industry codes.

The APA Group provided documents which assured the Technical Regulator that their staff has sound and well-developed systems in place to ensure that the risks to the South Australian community from the operation of the distribution networks are managed to an acceptable level. It also presented evidence that adequate systems are in place for ensuring the implementation of procedures for the training and assessment of competency of the APA Group staff (and contractors) in the audited areas.

7.3.3. Gas incidents

There were 28 major outages in 2018-19 (that is outages that affected more than five consumers) but no deaths or personal injuries were reported as a result of incidents in the distribution system. The Technical Regulator noted that the number of major outages in 2018-19 was higher (by 12) than the number of major outages (16) in 2017-18. This trend may be largely attributable to the increased amount of mains replacement that has been undertaken over 2018-19.

In 2018-19, the Technical Regulator supported a program entitled 'Gas Awareness for Emergency Services' that the APA Group carried out for the Metropolitan Fire Service (MFS) and a number of Councils. This is a program to ensure that the appropriate parties are aware of the properties and characteristics of gases, how gas networks operate and how their employees can work in successfully with the APA Group crews to safely control a gas emergency.

7.3.4. Data reported by the APA group

APA group provides the Technical Regulator with distribution system operational data on an annual basis. This data includes third party damage, gas leak public reports and Unaccounted for Gas (UAFG) values. Table G6 provides the trend in these parameters for the last five years.

Table G6: Data reported by the APA group over the last five years

Data reported by APA	2014-15	2015-16	2016-17	2017-18	2018-19
Third party damage	672	675	653	620	665
Gas leak public reports	4,401	4,410	3,596	2,606	2,338
UAFG	1,212	827	735	716	692

During 2018-19, APA Group provided approximately 92,032 location services to various third parties via DBYD, significantly higher than in 2017-18 (86,483), highlighting that the South Australian public is more aware of using the DBYD service to minimise the risks of gas incidents.

The Technical Regulator continued to participate in a number of 'Utility Asset Strike Avoidance' workshops organised by SafeWork SA in 2018-19. This provided an opportunity to discuss the approach to minimise strikes/incidents of third parties to the utilities assets and reduce the safety risks to the public in South Australia. The workshops resulted in the production of six videos by SafeWork SA for all industry stakeholders. These videos address the appropriate safety and procedural steps to be undertaken by third parties working in the proximity of the utilities' assets.

Public reports for gas leaks have decreased over the last year and the 2,338 recorded for 2018-19 can be divided between:

- 1,673 publicly reported gas mains and services leaks;
- 665 public reports of third-party damage;

The Technical Regulator noted that the reported UAFG value was 692 TJ, based on the Australian Energy Market Operator (AEMO) calculations (as of 30 June 2019) and has been decreasing over the last 7 years. This trend is coincident with and may be largely attributable to the amount of mains replacement that has been undertaken. This value represents approximately 2.1 % of the total quantity of gas that entered the distribution system.

Following a review of the AGN mains replacement program, as outlined in the DMSIP for 2018-19, the Technical Regulator noted that AGN replaced approximately 224.6 km and decommissioned approximately 0.8 km (totalling 225.4 km) of old cast iron, unprotected steel and HDPE gas mains. The overall progress of mains replacement was approximately 23.4 km above the AGN annual target of 202 km.

The Technical Regulator was pleased that AGN has exceeded its regulatory target of mains replacement in the Adelaide Central Business District (CBD) in 2018-19. AGN has replaced 12.6 km in the CBD which was 0.6 km above its regulatory target for the financial year (12 km). In addition, AGN assured the Technical Regulator that they are still committed to replacing all mains in the CBD by the end of the current 2016-21 Access Arrangement.

The Technical Regulator was also advised that AGN is managing the risks associated with gas mains not yet replaced in the CBD. This is done by carrying out regular leakage surveys and monitoring public gas leak reports. The results from these activities indicated that there does not appear to have been any further deterioration in gas mains integrity within the CBD over the last few years.

AGN also advised the Technical Regulator that it has budgeted to replace a further 211 km of gas mains in 2019-20 (this includes 12 km of gas mains to be replaced in the CBD). The Technical Regulator noted that, in addition to CI and UPS mains replacement (89 km), AGN will continue work in 2019-20 on the replacement of 110 km of HDPE mains prioritised as locations of greatest risk.

7.4. Safety of LP gas Distribution Networks

The Technical Regulator was advised by ELS about a further expansion of the LP gas distribution network at the Bluestone Estate development in Mount Barker. In 2018-19, The Bluestone Estate development was close to completion with around 970 consumers connected to the LP gas distribution network.

The Technical Regulator also monitored the progress of the construction of ELS' new LP gas distribution networks in Mt Barker located at the Aston Hills Estate (163 consumers already connected with the potential to increase to approximately 1900 consumers), the Springlake Estate (210 consumers connected) and at the Newenham Estate (49 consumers connected).

The Technical Regulator was advised that, in 2018-19, ELS continued the construction of the LP gas networks at the six new developments in Mount Barker (Minters Field, Matilda Rise, Blefari, Amblemead, Clover Park and The Lodge developments). In addition, in 2018-19, AGN continued the construction of its own LP gas distribution network at the Glenlea Estate in Mount Barker. The Technical Regulator will be monitoring all ELS and AGN field activities at the sites in Mount Barker to ensure that they are carried out in accordance with the correct technical requirements.

Table G7: LP gas distribution networks under development in South Australia

Network Location	Owner/ Operator	Length of Main (m)	Operating Pressure (kPa)	Number of consumers
Mount Barker (Bluestone Estate, Lifestyle Village and Scarlet Crest Estate)	ELS	15,219	120	970
Mount Barker (Springlake Development)	ELS	5,421	120	210

Mount Barker (Aston Hills Development)	ELS	4,741	100	164126
Mount Barker (Newenham Development)	ELS	2,3745	70	4912
Mount Barker (Minters Fields Development)	ELS	1,697	120	63
Mount Barker (Matilda Rise Development)	ELS	663	70	12
Mount Barker (Blefari Development)	ELS	2,726	100	79
Mount Barker (Amblemead Development)	ELS	1,080	70	32
Mount Barker (Clover Park Development)	ELS	1,614	70	N/A
Mount Barker (The Lodge Development)	ELS	330	70	4
Mount Barker (Glenlea Development)	AGN	1,750	100	N/A

7.4.1. Auditing for safety and technical compliance

In 2018-19, the Technical Regulator carried out field audits of the approved SRMTMPs and held regular meetings and discussions as the mean of obtaining assurance that the owner operators effectively comply with their SRMTMPs in the operation of their LP gas distribution networks in South Australia (i.e. Origin Energy LPG at Cape Jaffa Anchorage, Victor Harbor, Renmark, Port Lincoln and Wallaroo, ELS at Mt Barker and Elgas Ltd at Clare). The Technical Regulator's general finding from the audits was that the operators of the LP gas networks had adequate systems in place for most of the areas audited to ensure the safe operation of their LP gas networks.

The Technical Regulator was satisfied that the risks to the community from the operation of the LP gas distribution networks are being managed to an acceptable level by competent and appropriately trained personnel.

7.4.2. Incident reporting

There were no deaths or personal injuries from the LP gas distribution networks incidents in South Australia during 2018-19.

ELS reported to the Technical Regulator that there were 13 gas leaks reported to ELS from the LP gas distribution networks in Mount Barker in 2018-19. All of them have been promptly repaired by ELS's field staff.

During 2018-19, there were a number of cases where the Technical Regulator undertook an investigation of issues in relation to the installation and supply of LP gas.

Section 8: Gas Installations

8.1. Natural Gas and LP gas Installations

8.1.1. Residential and Light Commercial Gas Installations

The Technical Regulator is responsible for ensuring that installation work is performed in a safe manner, using appropriate methods and materials that are compliant with relevant Standards. Generally, gas installation work involves the connection of new gas appliances. The following table shows the approximate number of new or modified installations and connections over the year.

Table G8: New or modified installations and connections in 2017-18 and 2018-19

	2017-18	2018-19
New domestic and light commercial appliances sold and installed	54,500	52,100
Existing installations that required repair, replacement or extension	13,213	13,863
New natural gas connections to distribution network (residential & commercial/industrial)	8,732	7,979
New LP gas connections to residential and light commercial premise (estimated)	2,412	2,531

In larger new residential developments where natural gas is not available, it is becoming increasingly popular to supply LP gas by means of reticulated LP gas systems supplied from large storage tanks located on the perimeter of the estate. The estimated 10,510 new natural gas and LP gas connections facilitated the supply of gas to 26,275 individual new gas appliances*.

* Based on an industry accepted average of 2.5 gas appliances installed per new residential/commercial connection

8.1.2. Industrial and Large Commercial Gas Installations

The Biogas project at Teys Australia in Naracoorte involves a Covered Anaerobic Lagoon and Combined Heat and Power Plant. This I&C gas complex installation was monitored by the Technical Regulator during 2018-19, as highlighted in the following case study.

Teys Australia Abattoir in Naracoorte has a new covered Anaerobic Lagoon to capture and store Biogas generated by the anaerobic digestion and breakdown of plant offal and waste produced at the meat processing plant. The captured Biogas is initially treated to remove condensate (moisture) and conditioned prior to primary compression and transportation 600 metres underground within a 200 mm diameter Polyethylene gas pipeline. Further moisture is removed in a dewatering pit, and the biogas then runs above ground into the biogas combined heat and power facility where final conditioning and pressure boosting occurs prior to consumption by a Combined Heat and Power (CHP) gas engine. The electricity and heat generated is then utilised by the Teys Australia meat processing facility to offset part of their energy costs. The project involved reviewing complex installation designs prior to construction and iterations post construction.



8.1.3. Auditing for Compliance

Proactive Audits

An estimated 57,937 residential and light commercial gas installation jobs were completed in South Australia during 2018-19 and of these installation jobs 1,419 were audited in this manner.

Table G9: Results of installation auditing

Area of Audit	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19
Domestic/light commercial audits	1,276	1,195	1,034	960	1,091	1,034	1,025	1,353	1,419
100% Domestic safety checks at all new meter connections *	10,351	8,919	8,621	8,198	8,544	8,260	8,663	8,345	7,580
I&C audits	96	99	91	75	87	103	95	82	97
Caravan & tourist park gas safety audits	10	29	28	22	27	14	5	9	0
Caravan Retailer audits **	-	-	-	-	-	-	-	-	13
Complaints resolved	670	456	550	680	709	618	577	633	605
Investigative interviews	20	16	15	12	11	7	5	3	6
Warning letters sent	90	66	68	63	65	80	69	169	150
Expiation notices issued	7	8	6	6	0	0	0	0	0
Area of Audit	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19
Referrals to Consumer and Business Services (CBS) – re: licensing issues	13	13	10	8	3	7	5	2	7
Referrals for remedial training. (Self-initiated enrolment)	20 (8)	20 (8)	14	6	4	2	2	2	1

* *New residential consumer installation and appliance safety checks were performed by Phoenix Pty Ltd and McPlumb technicians (contractors for the APA Group) prior to connection to the natural gas distribution system for the first time under an agreement with the Technical Regulator.*

** *Caravan retailers audited commenced in 2018-19.*

An estimated 326 large commercial and industrial gas installation jobs were completed during the period and the Technical Regulator pro-actively audited 97 of these jobs for compliance with AS 3814 – Gas Fired Industrial and Commercial Appliances and AS/NZS 5601 – 2013 Gas Installations.

When undertaking complex audits, OTR inspectors inspect the following as applicable: NG meter or LPG cylinder/tank placements, pipe work is fit for the application, appliance types and evidence of certification, over pressure protection, flueing, ventilation systems and compliance documentation covering certificates of compliance/pressure test result, purge plans and commissioning approval for type B appliances. Installations are assessed to ensure that they meet the requirements and standards called up by the Gas Act 1997.



Figure G3: Gas Valve Train serving a Kiln Preheater (type B Appliance) and installation audited by an Authorised Officer

Audits of permanent gas installations at tourist and caravan parks

52 caravans were audited at 13 caravan retailers or manufacturers during 2018-19.

The most common non-compliances found were:

- Exchange LP gas cylinders located too close to ignition sources or incorrectly restrained;
- Insufficient ventilation in caravans;
- Clearances from appliances to adjacent combustible surfaces.
- Insufficient display of markings, i.e. instructions, warning notices, operating instructions and marking plates.

All non-compliances found were rectified at the expense of caravan manufacturers.

Installation Audit Results

The number of proactive audits of residential and light commercial installations that were completed in the year was 1,419 with a split of 1,168 inspections for natural gas versus 251 for LP gas installation. LP gas installations are audited at a higher relative rate for the population base for several reasons:

- LP gas is potentially a more hazardous fuel that is heavier than air with a higher heating value;
- Because these jobs are often found in more remote locations there may be the perception that compliance with the Standards is not so important because there is less chance that the Technical Regulator will audit the work;
- Often existing gas work on site has been performed by unlicensed persons due to the limited availability of skilled licensed persons in some areas or the DIY mentality in some remote areas.

Enforcement activities for non-compliant gas installations

A total of 150 warning letters were issued during the year, 91 to gas fitting contractors, 59 warning letters to owners. No expiration notices were issued in the last four years as the Technical Regulator prefers that non-conformances are addressed and rectified by the gas fitter as part of their rehabilitation and education. This results in a positive outcome for the consumer in that the installation is made safe, compliant and the gas fitter actively learns from their mistake. Gas fitters also lose income earning opportunities while making good of their work. Taking legal action may introduce the risk of not facilitating the remediation of the actual non-conformance.

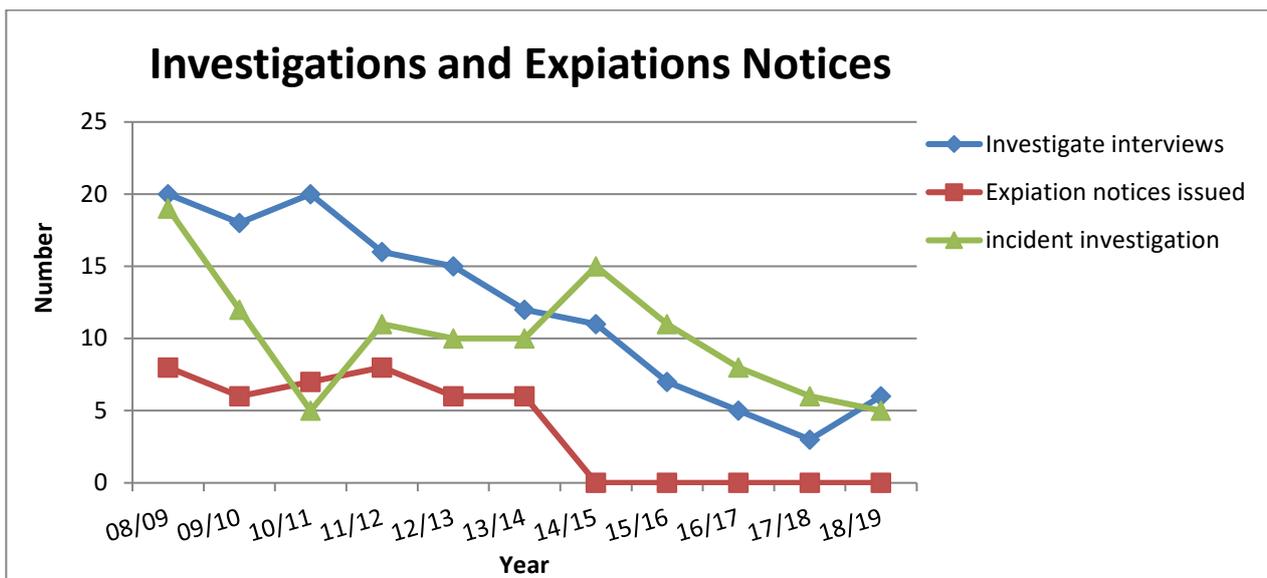


Figure G4: Investigations and Expiation Notices

Referrals to CBS

There were three people found to be performing gas installation work whilst unlicensed, unregistered or performing work outside the scope of their licence or registration and they were referred to the licensing authority CBS for action. CBS investigated the matters and considered the recommendations made by the Technical Regulator in making their deliberations.

8.1.4. Gas incidents – Installations

In 2019 there was a total of 5 gas related incidents, 4 resulted in injury or property damage, and 1 resulted in ill health, (occupant exhibiting short term symptoms of Carbon Monoxide exposure). All reported incidents were LPG, they were investigated and are summarised as follows:

- Domestic premises supplied by a single 180 kg LPG tank. Failure of the first stage LP Gas regulator resulted in the installation being exposed to high pressure LP Gas which caused compromised the appliance controls causing them to leak gas which accumulated and ignited off adjacent ignition source to cause an explosion/flame flash at the appliances. Installer/owner sustained burns and required treatment Damage approx. (\$4500). Installer error due to incorrect component selection.
- Domestic residence. The owner was changing a 9 kg LP Gas cylinder on his portable gas BBQ and failed to correctly turn off the cylinder valve and appliance controls first. A high-pressure gas leak occurred at the connection adjacent to the lit burners resulting in a flame flash/fire. Owner burnt and (\$15,000+ property damage);
- Commercial application. Holiday rental cottage on LP Gas. Cooker incurred a flame flash / fire as one of the operating controls was accidentally left turned on. This allowed leaking gas to accumulate and ignite from an adjacent ignition source. One operating control knob was replaced with an aftermarket part that was not marked appropriately to indicate if the control was on or off. Tenant accidentally left a cooker control on when finished cooking, thus leaking unburned gas. The tenant then experienced facial/hand burns when investigating a gas smell and accidentally operating the cooker ignition system. Damage to property and medical expenses (\$2500)
- Domestic residence. Owner changing a 9 kg LP Gas cylinder on a portable gas BBQ and failed to correctly turn off the cylinder valve and appliance controls first. A high-pressure gas leak occurred at the connection adjacent to the lit burners resulting in a flame flash/fire. Owner incurred superficial burns and (\$2,000+ property damage);
- Recreational Vehicle on LP Gas. Near miss incident. Occupiers health temporarily affected by the effects of Carbon Monoxide (CO) exposure. Investigations are ongoing and may result in a recall or safety alert incurring changes to the storage water heater manufacturer or installation method.

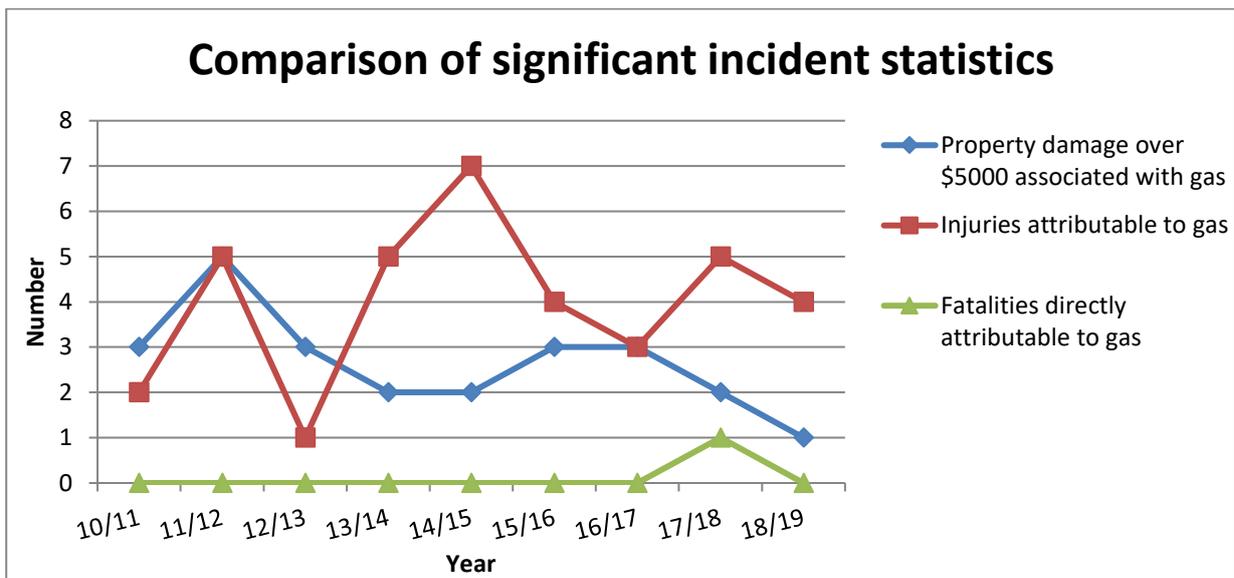


Figure G5: Comparison of Significant Incident Statistics

8.1.5. Gas Certificates of Compliance (GCC)

Gas contractors have transitioned to the new electronic Certificates of Compliance, (eCoC) and the Technical Regulator is working with individual contractors that have difficulty migrating to the new system. To create a gas eCoC, a contractor registers online to create an account in the eCoC portal. This enables contractors/workers to just log in to the eCoC portal to complete the details of their work. Once the eCoC draft is submitted by the contractor, the system compiles a PDF eCoC and emails it to the nominated recipients. Emails can be dispatched in real time thus improving communications and gas contractors can visit the portal and access their historic certificates at any time.

8.1.6. Communication and Education

Industry Liaison and Support

The Technical Regulator provides information about Standards to gas fitting contractors, architects and engineers, as well as to commercial and industrial users of gas. During the year staff handled approx. 6,200 technical enquiries relating to gas installations or appliances.

The Technical Regulator has developed several pamphlets, guides and technical bulletins which address the most commonly asked technical gas enquiries. These are provided at no charge and, in some cases, we have versions for the public and the trade depending on the target group.

Technical Presentations

The Technical Regulator provided 29 technical gas presentations during the year of which 17 were for gas fitters/contractors throughout the state, 1 presentation was for the members of the Australian Hydraulics Services Consultants Association.

In addition, 10 presentations were provided to event managers responsible for the events listed below to make them aware of their legal responsibilities in relation to gas safety compliance for their event in the areas of, management / auditing / records - risk management and how to use LP gas safely: The gas compliance management of those events was then verified by selective auditing and further support provided where identified.

- Royal Adelaide show committee;
- Superloop 500 Project Managers;
- Tasting Australia;
- Beer and BBQ Festival;
- Carnevale;
- The Unley Gourmet Gala;
- Adelaide Fringe Festival;
- Garden of Uneathly Delights;
- Glendi Festival;
- Schutzenfest;
- WOMAD.

Section 9: Gas Products

The program to audit and monitor gas appliance retailers with a view of eliminating the sale of uncertified gas appliances in South Australia targeted smaller retailers and supermarkets that are less likely to be aware of certification requirements for gas appliances. The objective was to increase community awareness and change the behaviours of sellers and buyers. A reduction in sales of uncertified appliances was achieved in the short term but long-term monitoring is required to confirm any positive changes in behaviour. There was also a general decrease in illegal online sales of appliances, in response to the Technical Regulator's gas safety campaign and monitoring activities.

Section 10: Gas Regulatory Coordination

10.1. Committee Representation

The Technical Regulator is represented on or has provided valuable technical comments to several Standards Australia committees as well as many other committees, forums and associations.

10.1.1. AG-001, Gas Appliances Committee

In 2018-19, the Technical Regulator participated on the AG-001 Gas Appliance committee as a representative of the GTRC. The committee convened periodically throughout the year to discuss and review gas appliance safety issues and to carry out the ongoing review of the gas appliance standards.

The committee presides over the harmonisation of the old AS 455x series of Standards (16 in all) as they are drafted across into the new joint AS/NZS 5263 series of Standards. This process began in 2010 and is ongoing and likely to be finalised by mid to late 2020 with the final catch-up draft of the central Part 0 Standard. One of the very new parts to be added to this suite of Standards is covering "small gas engines".

This is very significant as will help appliances such as gas-powered air-conditioning systems and generators to be accredited as Type A appliances instead of individual accreditation under a Type B testing regime. This Standard has been complex but is now heading through Standards Australia process before publication around December 2019. The transition of the more conventional gas appliances is nearing completion.

10.1.2. AG-008, Gas Distribution Committee (AS/NZS 4645)

In 2018-19, the Technical Regulator participated in the AG-008 Gas Distribution committee as a representative of the GTRC. The committee convened periodically throughout the year to address the future amendments to all three Parts of Gas Distribution Standard AS/NZS 4645 (Part 1: 'Network Management', Part 2: 'Steel pipe systems' and Part 3: 'Plastic pipe systems').

The main areas of the amendments for the Committee consideration covered the following; gas meter locations requirements, formal risk assessment criteria, gas quality assessment, gas incidents register systems and implementation of standardisation for Future Fuels e.g. Hydrogen and Biogas.

During the committee's activities, the Technical Regulator communicated information to and from industry stakeholders (e.g. gas distribution networks operators, the general public in South Australia, and GTRC) and Standards Australia to ensure that their views are represented in the development of the future improvement to AS/NZS 4645.

10.1.3. Damage Avoidance Committee

In 2018-19, the OTR gas and electrical groups continued to be represented on this committee which was formed in 2016-17 and facilitated by SafeWork SA for Industry stakeholders / State and Federal

Government interaction on water-gas-electrical and various communications utilities. It mostly focused on damage avoidance of infrastructure services, stakeholder representation to collaboratively formulate codes of practice and producing safety education material for industry. In September 2017, SafeWork SA published on their website, the six animated videos which address the approach to minimise strikes and incidents of third parties to the utilities assets and reduce the safety risks to the public.

Volume III - Water and Plumbing Industry

Section 11: Water and Sewerage Infrastructure

11.1. Regulation of Water Industry Entities

11.1.1. Technical review of licence applications

The Technical Regulator provided technical advice to the Commission on the following new licence applications during 2018-19:

Table W1: licence applications reviewed by the Technical Regulator in 2018-19

Licensee	Licence category	Service Provided		
		Drinking water	Non-drinking water	Sewerage
Enwave Tonsley Ptd Lty	Application	No	Yes	No

11.1.2. Safety, reliability, maintenance and technical management plans (SRMTMPs)

The Technical Regulator reviewed and approved the following SRMTMPs during 2018-19:

Table W2: Number of SRMTMPs received, reviewed and approved

Year	SRMTMPs received	SRMTMPs reviewed	SRMTMPs approved
2018-19	19*	19*	14
2017-18	30*	30*	16
2016-17	38*	38*	23
2015-16	48	41	15

* This number accounts for SRMTMP that have been received and reviewed several times after incorporation of comments made by the Technical Regulator in the first review

11.1.3. Water industry entity audits

During the 2018-19 financial year, a total of 11 audits of water industry entities were undertaken to confirm compliance with their SRMTMP and to ensure the safe and reliable operation of the infrastructure. The services that the water industry entities provided is including in Table W3.

Table W3: Number of audits undertaken in per type of services

Type of services	Audits undertaken 2017-18	Audits undertaken 2018-19
Drinking water, non-drinking water & sewerage	3	1
Drinking Water	0	2
Non-drinking water & sewerage	4	2
Non-Drinking water	0	2
Sewerage	1	4

The licence type of water industry entities audited is included in Table W4.

Table W4: Number of audits undertaken per type of licence

Type of licence	Audits undertaken 2017-18	Audits undertaken 2018-19
Minor	1	4
Intermediate	6	6
Major	1	1

Section 12: Plumbing Installations

12.1. Plumbing Compliance

12.1.1. Expiations

The following compliance activities were undertaken between 1 July 2018 and 30 June 2019:

- 6,817 plumbing audits were conducted.
- 5 expiation notices were issued for non-compliant plumbing
- 35 compliance investigations were initiated;
- 22 interviews were conducted to discuss non-compliant plumbing installations;
- 7 rectification notices were issued for breaches of the *Water Industry Act 2012*;
- 9 re-inspection fees were issued;
- 11 induction interviews were conducted.

Audits are monitored through a fortnightly review allowing the Technical Regulator to ensure all outstanding non-compliant installations are rectified.

12.1.2. Plumbing Certificates of Compliance

For the period 1 July 2018 to 30 June 2019, 19,088 Certificates of Compliance were submitted to the Technical Regulator.

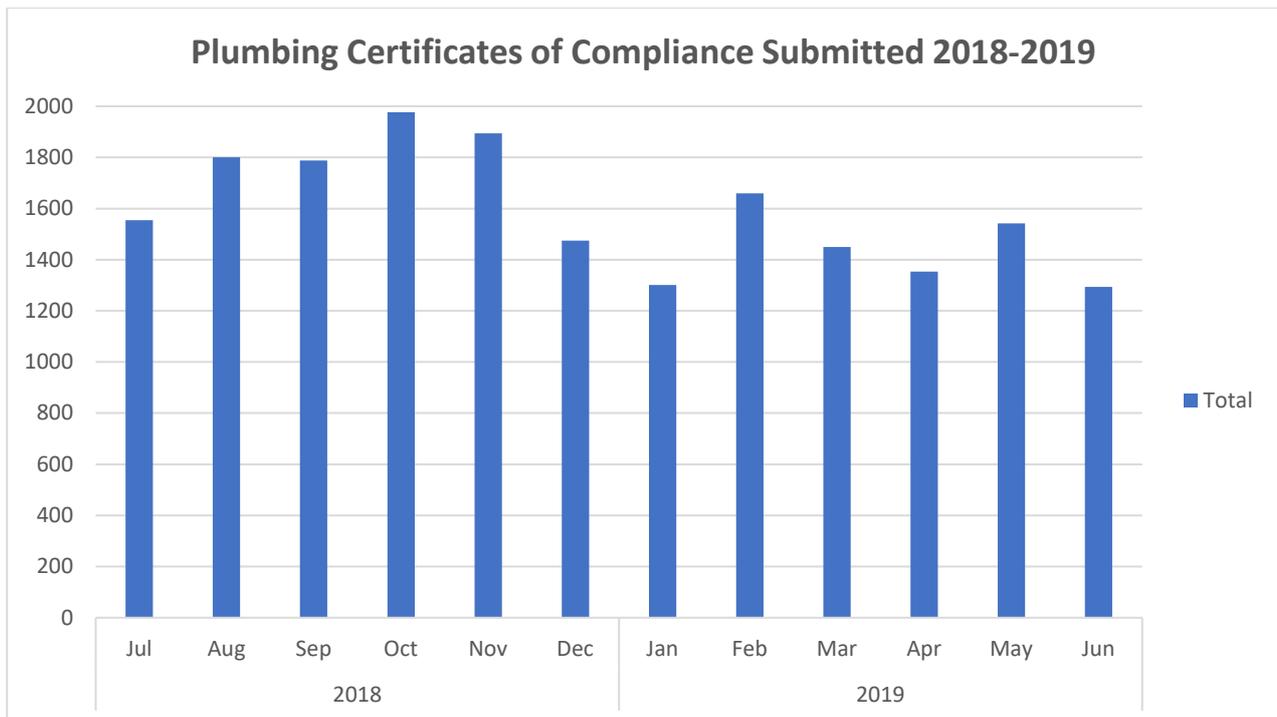


Figure W1: Plumbing Certificate of Compliance statistics

Note: Hard copy CoCs were replaced by electronic CoC's after 30 June 2018.

12.2. Plumbing Audits

12.2.1. Plumbing Bookings and Audits

The Technical Regulator requires plumbers to notify the OTR where plumbing and drainage installations are connected to SA Water infrastructure. Site audits are sample selected via the Electronic Certificate of Compliance (eCoC) / 'Plumbbookings' case management system. OTR allocations depend upon the

particular category of plumbing, associated risks & relevant public safety issues (eg. backflow protection, non-drinking water).

The Technical Regulator conducted a total of 6,817 on-site plumbing audits and 578 desktop hydraulic design audits in the 2018-19 financial year which included 146 Final Audits (table 2.1).

Table W5: Commercial & industrial and residential plumbing inspections for 2018-19

Job Category	Commercial & Industrial Jobs Inspected	Residential Jobs Inspected	TOTAL
Above Ground Sanitary Plumbing	381	950	1,331
Backflow Audits	28	7	35
Drinking Water Irrigation - Parks/Recreational	7	1	8
Encumbrance Investigation	2	42	44
Final Audit	117	29	146
Fire Services (in ground)	179	1	180
Greywater Systems	0	1	1
Hot and Cold (first fix)	28	57	85
Hot Water Heater Installation	18	97	115
Non-Drinking Water	45	446	491
Sanitary Drainage Installations	396	1,509	1,905
Sewer Investigations	2	6	8
Site Inspection / Inspection	67	47	114
Trade Waste	352	10	362
Underfloor Plumbing	294	1,672	1,966
Water Investigations	5	21	26
Desktop Audit – Hydraulic Designs	578	0	578
Total Inspections	2,499	4,896	7,395

Plumbing and drainage installations listed in table 2.1 can range from the addition of a toilet en-suite, a residential home, to more complex commercial installations within shopping centres or multi-storey high-rise apartments. All audits are assessed against the Plumbing Standard (published pursuant to Section 66 of the *Water Industry Act 2012*). This Standard has adopted relevant sections of the 2019 Plumbing Code of Australia (PCA). In addition, all plumbing installations must meet the performance requirements of the PCA through the deemed-to-satisfy solutions of AS/NZS 3500 plumbing and drainage Standard (or in some cases by a performance solution).

12.2.2. Metropolitan and Regional Audits

Metropolitan and regional plumbing audits this year included over 3,871 on-site sanitary underfloor and drainage inspections, these categories have been identified as having a high risk of non-compliance.

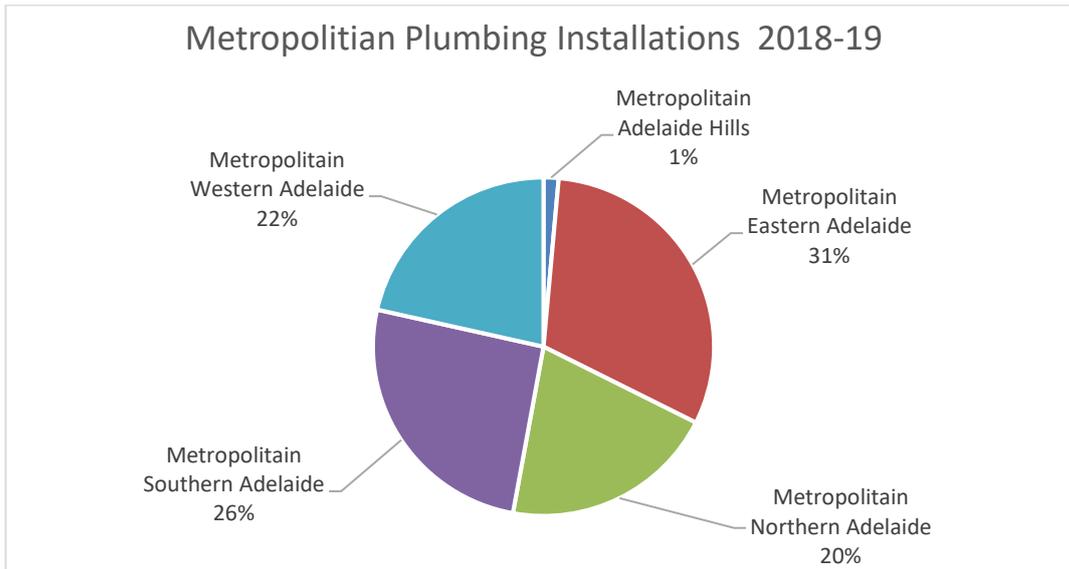


Figure W2: Metropolitan plumbing installation audits for the 2018-19 financial year

The Technical Regulator also maintained its regulatory presence in regional areas through programmed audits of on-site plumbing. In the 2018-19 financial year over 600 audits were conducted in regional areas of South Australia (refer to Figure W2 and Figure W3).

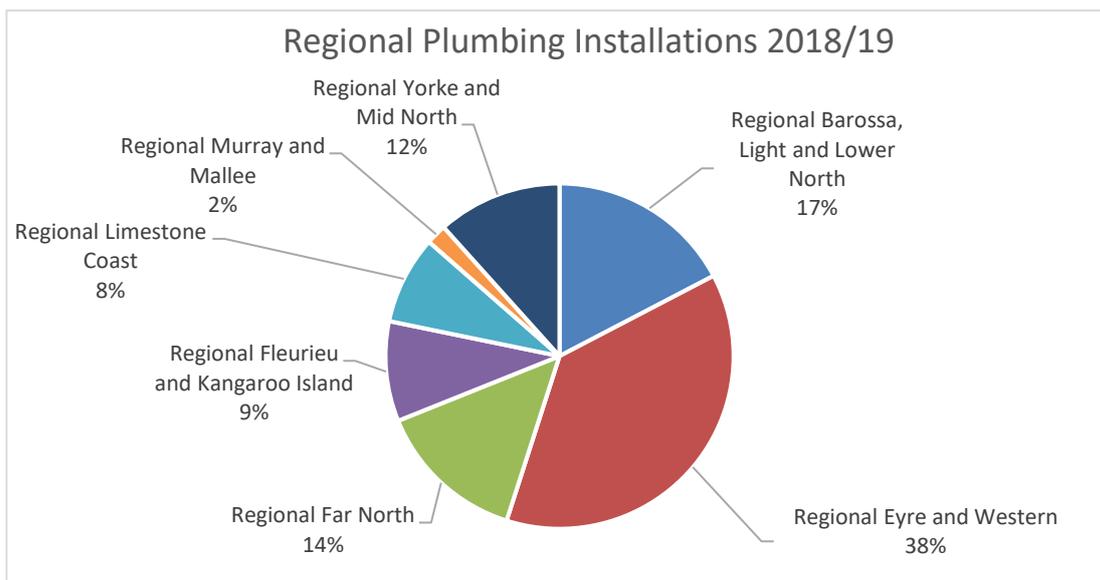


Figure W3: Regional plumbing installation audits for the 2018-19 financial year

12.2.3. Audits Notification Changes - 'My Plumbbookings' Tab within eCoC

In consultation with industry, the Office of the Technical Regulator has updated the online eCoC booking notification system. Plumbers can now log onto the eCoC system online and click on the 'Plumbbooking' & 'MyPlumbbookings' tabs to create, manage and track the progress of plumbing and drainage bookings.

The 'MyPlumbbookings' is a replacement for the SMS notifications system. The eCoC portal is accessible to plumbers 24/7 and has been designed to be used on smart mobile phones (Android/iPhone), iPad and computer devices. For more information refer to the [Changes to OTR Audit Notifications - July 2019](#).

12.3. Fire Fighting Water Services

12.3.1. Fire Service Audits and Inspections

During the 2018-19 financial year, 180 fire service and 491 non-drinking water service audits were conducted by the Technical Regulator.

The Technical Regulator continues to provide information relating to Fire Hydrant Services and non-drinking water services to plumbers, industry and stakeholders as part of the annual roadshow presentations.

The FPPA101D and FPAA101H Sprinkler Specifications have been referenced in the Plumbing Code of Australia 2019, the Technical Regulator will be undertaking sample audits of these systems to ensure adequate backflow protection is provided where the systems are connected to the buildings drinking water supply.

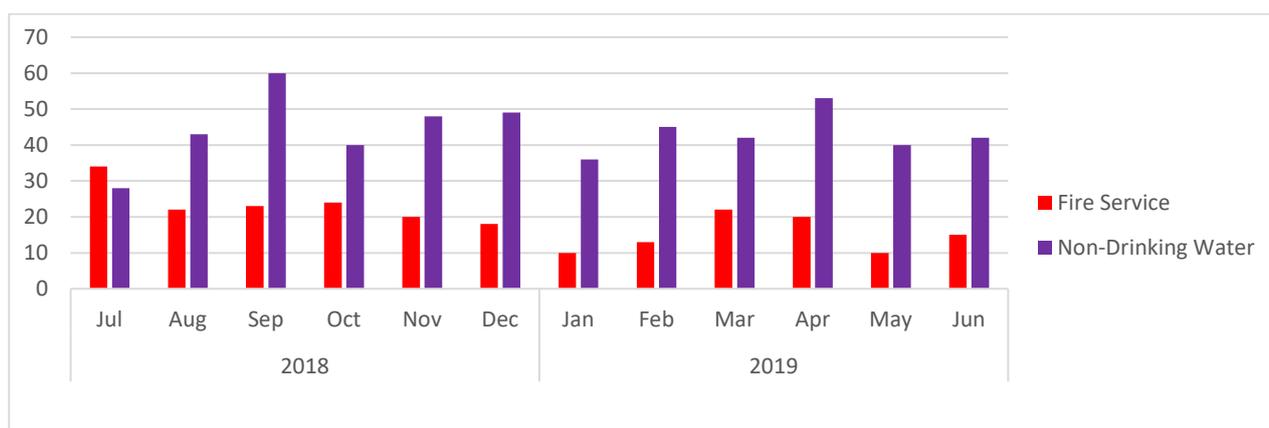


Figure W4: Fire service and non-drinking water audits for the 2018-19 financial year

12.4. Cross-connection Control and Backflow Prevention

Sites that contain dual drinking and non-drinking water systems must be protected against cross-connection and backflow incidences. This is achieved through the correct selection and installation of backflow prevention devices. These devices must be registered on the Technical Regulator database and property owners are obligated under Section 69 of the Act to have these devices tested every 12 months.

Councils monitor backflow devices connected to council land, as part of their on-going self-management plan. To ensure compliance the Technical Regulator conducts desktop and sample site audits for participating Councils who are on a self-management plan.

The Technical Regulator continues to monitor backflow prevention devices installed in plumbing systems at identified high-risk sites, testable backflow prevention devices must be tested every 12 months.

12.5. Industry Information and Training

The Technical Regulator works with the Plumbing Industry to ensure they have a full understanding of their responsibilities under the Act when installing plumbing and drainage systems and are kept up to date with any regulatory changes are introduced.

The Technical Regulator in conjunction with the Master Plumbers Association conducted industry roadshows in regional and metropolitan areas throughout the State in the 2018-19 financial year. The general theme of the roadshows was to provide an update on the 2019 National Construction Code Volume Three and the deemed to satisfy provisions associated with the AS/NZS 3500 Plumbing and drainage standards. One of the major inclusions in the 2019 PCA was the introduction of a new section Part B5 "Cross Connection Control". This section will include mandatory hazard protection requirements for

containment, zone and individual protection associated with backflow prevention. This inclusion will be in addition to the requirements in AS/NZS3500 which are informative.

Other industry information sessions have been conducted with agencies such as Domiciliary Equipment Services and Novita Assistive Technology Solutions to provide information on the installation of Douche Seats, Temperature control to prevent scalding and legionella control.

Several information sessions have been also been conducted with TAFE and Peer Students on Fire Hydrant Service installations and backflow prevention.

The Technical Regulator has also reviewed the training packages for the Plumbing qualifications to the plumbing services stream and Certificate IV Plumbing and Services.

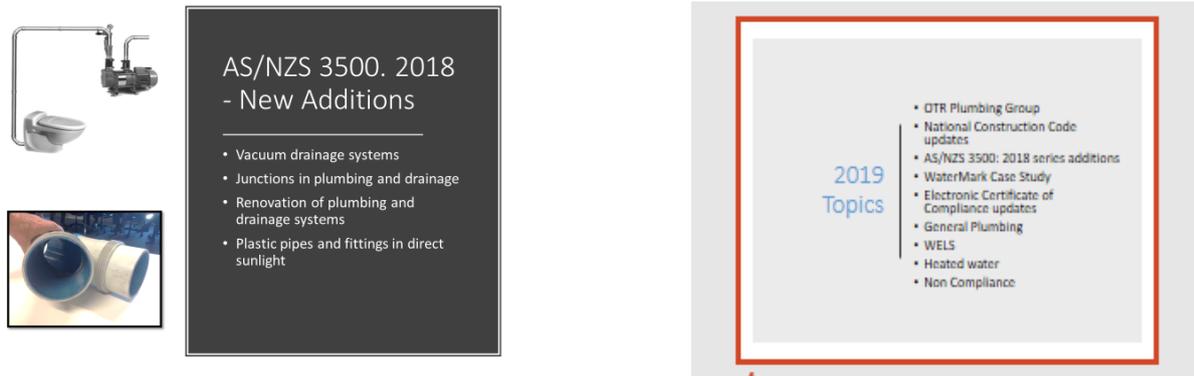


Figure W5: Update on the 2019 National Construction Code Volume Three

12.6. Property Interest Reporting and Data Management

12.6.1. Property Interest Reports

Property Interest Report responses are initiated when a vendor (such as a conveyancer or home owner) submits a *Form 1 Vendors Statement* through the Land Titles Office. If the Technical Regulator has a registered interest in the property listed on the *Form 1 Vendors Statement*, the Technical Regulator will respond with details of the interest. The Technical Regulator holds an interest in properties that have been identified to have non-compliant plumbing work or backflow prevention device maintenance requirements. These reports are provided when a property is being prepared for sale or transfer.

The Technical Regulator processed a total of 1,287 Property Interest Reporting (PIR) requests for the 2018-19 financial year, which is similar to the number received the previous year.

To protect the integrity of data the Technical Regulator updates Change of Ownership details when a property is sold or transferred. There were 1,353 processed requests for Change of Ownership in the 2018-19 financial year.

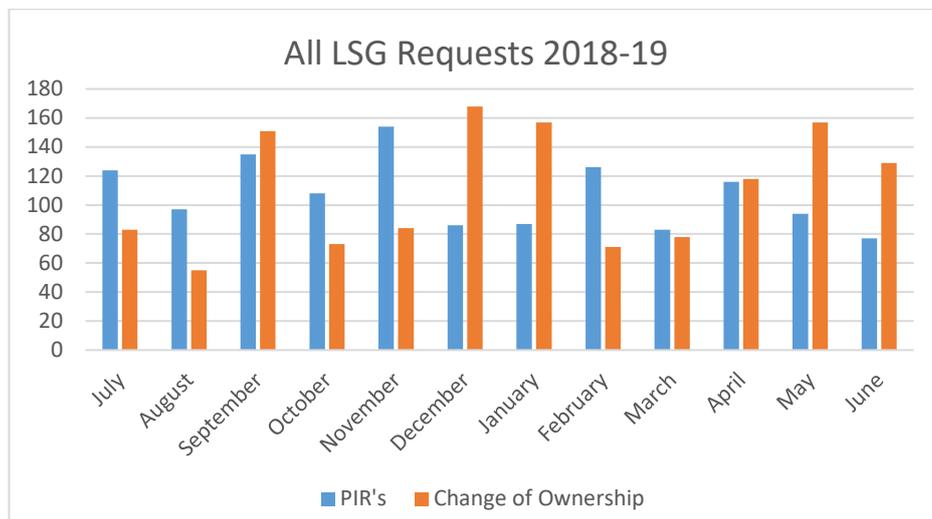


Figure W6: PIR monthly statistics for 2018-19

12.6.2. Data Management

New procedures were put into place to prevent the receipt of unnecessary PIR requests by completing regular cleansing of the database and interests held. This has kept the number of requests received at an optimal level without a dramatic increase, as previous years have held.

It also prevents requestors, such as lawyers and conveyancers, waiting for unnecessary responses from the Technical Regulator. Response from stakeholders regarding these changes has been positive.

Section 13: Plumbing Products

13.1. Plumbing Products certified under the WaterMark Certification Scheme

The WaterMark Certification Scheme (the Scheme) is a mandatory national certification scheme for plumbing and drainage products to ensure they are fit for purpose and appropriately authorised for use in plumbing and drainage installations.

The Australian Building Codes Board (ABCB) manage the Scheme, with States and Territories helping in the administration of the Scheme. It is important to note that not all plumbing and drainage products require WaterMark certification and authorisation. All products proposed to be used in plumbing and drainage installations require a risk assessment to be undertaken. Products that have been identified through the risk assessment as requiring WaterMark Certification are listed in the Schedule of Products (WMSP), Products that are low risk and not required to be Watermarked are listed on the Schedule of Excluded Products (WMEP).

The scheme's objective is to deliver plumbing and drainage products that are safe and fit for their intended use in and around buildings in an environment that is increasingly challenged by reduced resources for enforcement, increased product non-conformity and an ever-expanding global market. The Technical Regulator represents South Australia on plumbing product certification matters.

Following stakeholder consultation, the ABCB introduced an improved version of the Scheme on 1 July 2016.

Section 14: Regulatory Coordination

14.1. Regulatory Reform - Plumbing Code and Technical Standards

14.1.1. Revision of the Plumbing Code of Australia

The Australian Building Codes Board (ABCB) has two primary technical advisory committees, the Building Codes Committee (BCC) and the Plumbing Code Committee (PCC). These Committees provide advice to the Board to deliver its work program by providing a national forum for regulatory authorities and industry to consider technical matters relevant to building and plumbing regulation reform.

The Technical Regulator represents South Australia on the PCC, current projects being undertaken by the PCC include;

- Revision of the National Construction Code (NCC) Volume three. The NCC series is revised every 3 years the next revision is due in May 2019. The NCC public comment draft consultation period the 2019 NCC Series closed Friday, 13 April 2018.
- The ABCB has finalised a project on backflow prevention, a component of this project will be to include the deemed-to-satisfy cross-connection hazard ratings in the Plumbing Code of Australia.

14.1.2. AS/NZS 3500 Plumbing and Drainage Standards projects

Standards Australia is a standards organisation recognised through a Memorandum of Understanding with the Australian government as the peak non-government standards development body in Australia

The Technical Regulator represents South Australia on several working sub-committees that review the AS/NZS 3500 Plumbing and drainage standard series.

The AS/NZS 3000 Plumbing Standard suite is periodically amended and revised to accommodate innovation or development in materials, equipment and methods, these changes are timed to coincide with the publication of the National Construction Code series. The last revision of AS/NZS 3500 Parts 1,2 &4 occurred in 2018, the next amendment/revision of this standard will occur in 2022.

14.1.3. Non-Drinking Water Guidelines

The *Guidelines for Non-Drinking Water in South Australia*, which were introduced in 2016-2017 are used by the plumbing, water industry entities and property owners with a non-drinking water supply. They outline requirements and responsibilities for installing, operating and maintaining non-drinking water systems in accordance with the *Water Industry Act 2012*, *Water Industry Regulations 2012*, and appropriate technical Standards.

The guidelines have improved the overall compliance of non-drinking water installations. Contractors and Hydraulic Consultants are now aware of their responsibilities for submitting hydraulic designs of non-drinking water installations and irrigation systems for parks and recreational areas.

It is proposed through industry consultation to review the Guidelines in 2020 to ensure they are kept abreast of any changes to legislation and policy that have been introduced since the initial release.

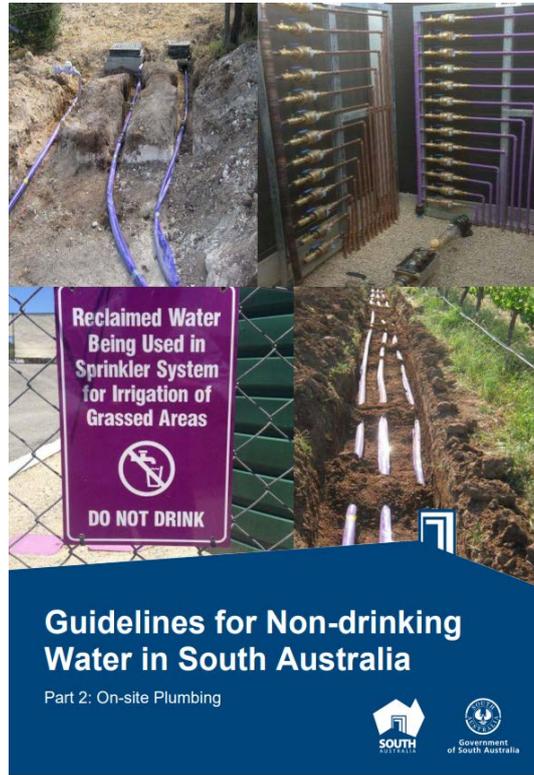


Figure W7: Cover of the Guidelines for Non-drinking Water in South Australia

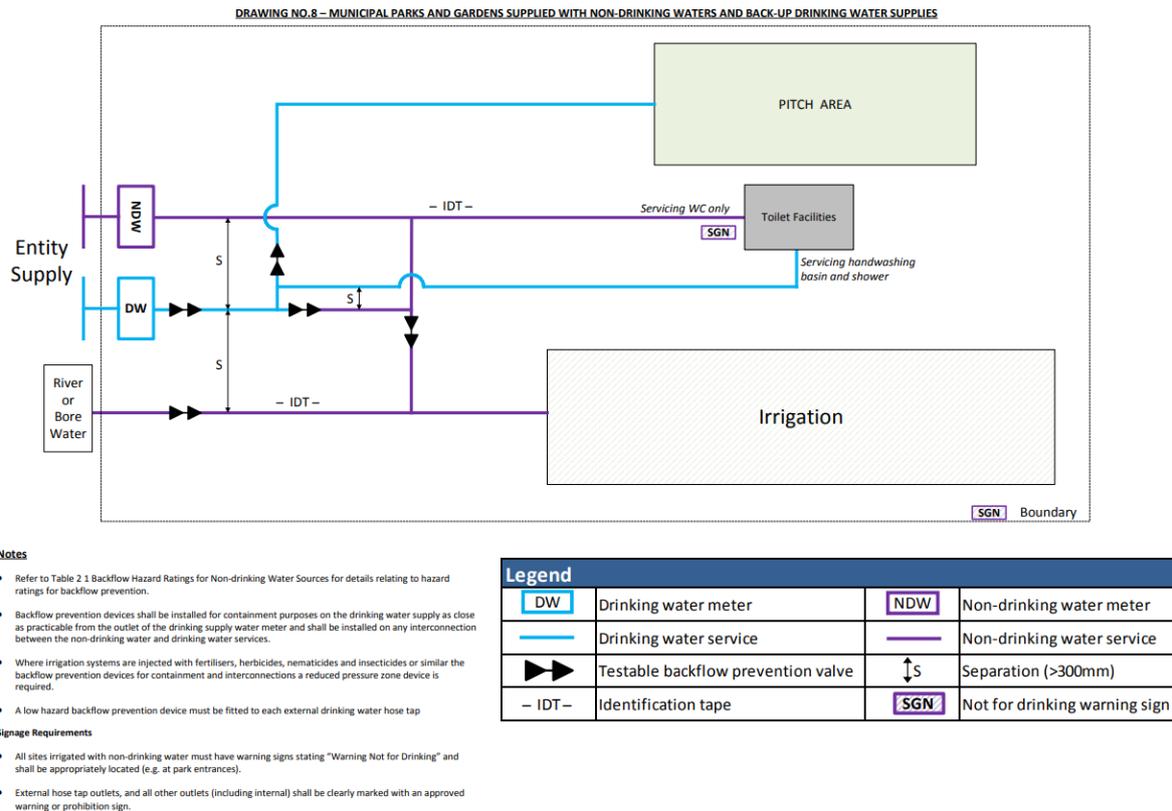


Figure W8: Example of dual reticulation supply diagram

14.1.4. Dual Reticulation Infrastructure Standard

In response to growing numbers of dual reticulation dwellings being developed in the State, the Technical Regulator has developed a draft Dual Reticulation Infrastructure Standard. The Standard prescribes the minimum requirements and responsibilities of all parties involved in dual reticulation infrastructure to ensure the safety and reliability of the water services provided to South Australian consumers.

With the significant amount of new developments taking place and more Water Industry Entities entering this field, the Technical Regulator has a growing concern that more misconnections may occur in the future, unless the requirements are clarified. The Technical Regulator has on numerous occasions, encountered non-compliances on-site and asked for these to be corrected. Those non-compliances were found during the construction stage and as such, no one was exposed to non-drinking water in those instances. However, due to limited resources, staff from the OTR cannot possibly inspect every site where the installation of dual water systems is being undertaken. Consequently, a more efficient solution was required to prevent future incidents under the form of the Standard.

14.2. Water Industry Technical Advisory Committee (WITAC–formerly PTAC)

For the period from 1 July 2018 and 30 June 2019, two technical advisory meetings were held on 27 November 2018 & 29 May 2019. Topics covered at these meetings included:

- Annual report update;
- Transparency for water industry entities;
- Non-drinking water guidelines;
- Plumbing roadshows;
- Plumbing audit feedback;
- Plumbing Code of Australia projects;
- Continuous Professional development;
- Fire services;
- Electronic Certificates of Compliance.

Volume IV: Key Performance Indicators

Table K1: ElectraNet Key Performance Indicators

Performance Indicator	Performance Measured	Definition of Indicator	2016 /17	2017/18	2018/19
Substation Routine Task Rate	Volume of planned substation maintenance	Number of Substation Routine Tasks completed	4,953	5,056	5,343
Line Routine Task Rate	Planned line maintenance during the period	Number of Line Routine Tasks completed during the reporting period	1,359	1,690	1,555
Substation Corrective Task Rate	Unplanned Substation maintenance during the period	Number of Substation Corrective Tasks completed during the reporting period	5,811	6,288	6,398
Line Corrective Task Rate	Unplanned Line maintenance during the period	Number of Line Corrective Tasks completed during the reporting period	4,836	4,206	7,180
Vegetation Infringements	Vegetation maintenance	Number of reported vegetation infringements unresolved within 7 days during the fire season	0	0	0
Fire Starts	Line maintenance	Number of fire starts caused by ElectraNet transmission assets.	0	0	0
Major Plant Failure Events	Events reported under 73(3)(a) of the <i>Electricity (General) Regulations 2012</i>	Number of failures of major plant requiring replacement (eg. HV transformers, circuit breakers, disconnectors, instrument transformers)	11	10	0
Electric Shock Reports	Safety	Number of shock reports	1	0	0
Switching Incident Rate	Switching safety	Number of switching incidents per number of switching plans issued	0.16%	0.26%	0.45%
Lost Time Injuries	Safety	Number of injuries resulting in more than one day lost	0	1	0
Lost Time Injury Frequency Rate	Safety	Number of injuries resulting in more than one day lost per million hours worked	0	1.97	0
Medical Treatment Injuries	Safety	Number of medical treatment injuries	1	0	0
Medical Treatment Injury Frequency Rate	Safety	Number of medical treatment injuries per million hours worked	2.12	0	0

Performance Indicator	Performance Measured	Definition of Indicator	2016 /17	2017/18	2018/19
Contractor Safety Incidents involving Injury	ElectraNet's contractor safety	Number of reported construction and maintenance contractor safety incidents involving injury	6	7 (1 LTI & 6 MTI)	8 (2 LTI & 6 MTI)
Emergency Management Plan Exercises	ElectraNet's emergency response preparedness	Number of completed Emergency Management Plan exercises	1	4	6

Table K2: Some of SA Power Networks Key Performance Indicators

Safety Management Indicators	2015/16	2016/17	2017/18	2018/19
Annual cumulative numbers of lost time accidents and near misses involving SA Power Networks personnel (including contractors)	6 Lost Time 1,479 Near Miss	4 Lost Time 1,169 Near Miss	3 Lost Time 1,627 Near Miss	3 Lost Time 1,196 Near Miss
Hazard logs greater than 30 days old	0	1	0	52
Number of in progress hazard logs	0	1	1	52
Actual workplace inspections carried out per annual inspections planned ¹	1,055	1,025	1,076 ¹	1,921 ¹
Number of shock reports per 1000 km of mains	7	7.5 ²	7.1	5.7 ²
Number of damage claims per 1000 km of mains	4.5	5.4 ³	2.3	1.5 ³
Number of fire starts per 1000 km of mains	0.57	0.51	0.88	0.8 ⁴
Number of switching incidents	22	19	13	27
Number of completed emergency plan exercises	3	4	5	4
Technical Management Indicators				
% meters within tolerance (per planned sample)	92.20%	95.90%	99.04%	95.37%
General Information				
Number of requests for underground locations provided per year	88,673	51,839	108,545	113,132
Number of revenue metering investigations carried out per year	4,534	5,388	4,316	1,746
Audited compliance against internal vegetation clearance procedures and agreements	Completed by GHD in December 2015	Completed by GHD in December 2016	Completed by GHD in December 2017	Completed by GHD in December 2018

Number of network access permits requested and number of network access permits issued ⁵	1,922 Requested 1,692 Issued	3,182 Requested 2,862 Issued	3,015 Requested 2,166 Issued	2,701 Requested 2,104 Issued
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Note 1: Estimated only by SA Power Networks

Note 2: $5.7 = [(508/89,308) \times 1000]$ where 508 is the number of Shock Reports; 89,308 is the total circuit length of SA Power Networks network used in the calculation

Note 3: $1.5 = (134/89,308) \times 1000 \times 1,000$ where 404 is the number of damage claims (one incident can result in multiple claims)

Note 4: $0.8 = [(72/89,308) \times 1000]$ where 72 is the number of fire starts; 89,308 is the total circuit length of SA Power Networks network used in the calculation

Note 5: Access Permits are issued for all Requests for Network Access (RNA) & for vegetation clearance work not received via an RNA

Note 6: Associated with the RNA's, or with ad-hoc requests to cut trees by SA Power Networks engaged tree cutters or to dig near SA Power Networks cables

Table K3: APA Group's Key Performance Indicators

Key Performance Indicators (KPIs) for the distribution networks, as supplied by AGN, owner of the distribution networks in South Australia, and the APA Group, operator of these networks, are as follows:

KPI Section	Aspects measured
1. Safety	Network and public safety
2. Measurement	Accuracy and reliability of gas metering and measurement of gas heating value
3. Quality	Natural gas quality
4. Reliability	Reliability of gas supply and equipment
5. Connections	Safety and soundness of customer connections to the pipeline network

Key Performance Indicator	2017/18	2018/19
Safety		
1.1 The maintenance of continuous, reliable gas supply		
Number of complaints of poor supply pressure	10	3
Number of gas outages (>5 consumers affected)	16	28
1.2 Instances of third party damage		
Number of damages to the mains and services, caused by third parties	620	665
Number of DBYD locations provided to third parties	86,483	92,032
1.3 Dealing with potential accidents or unsafe situations		
Emergency plan exercises	4	4
Number of evacuations directly attributed to a gas leak from mains or inlet services	1	1
Number of instances where a gas leak from a network enters a building	5	2
Number of fires caused by a gas leak from a network	0	0

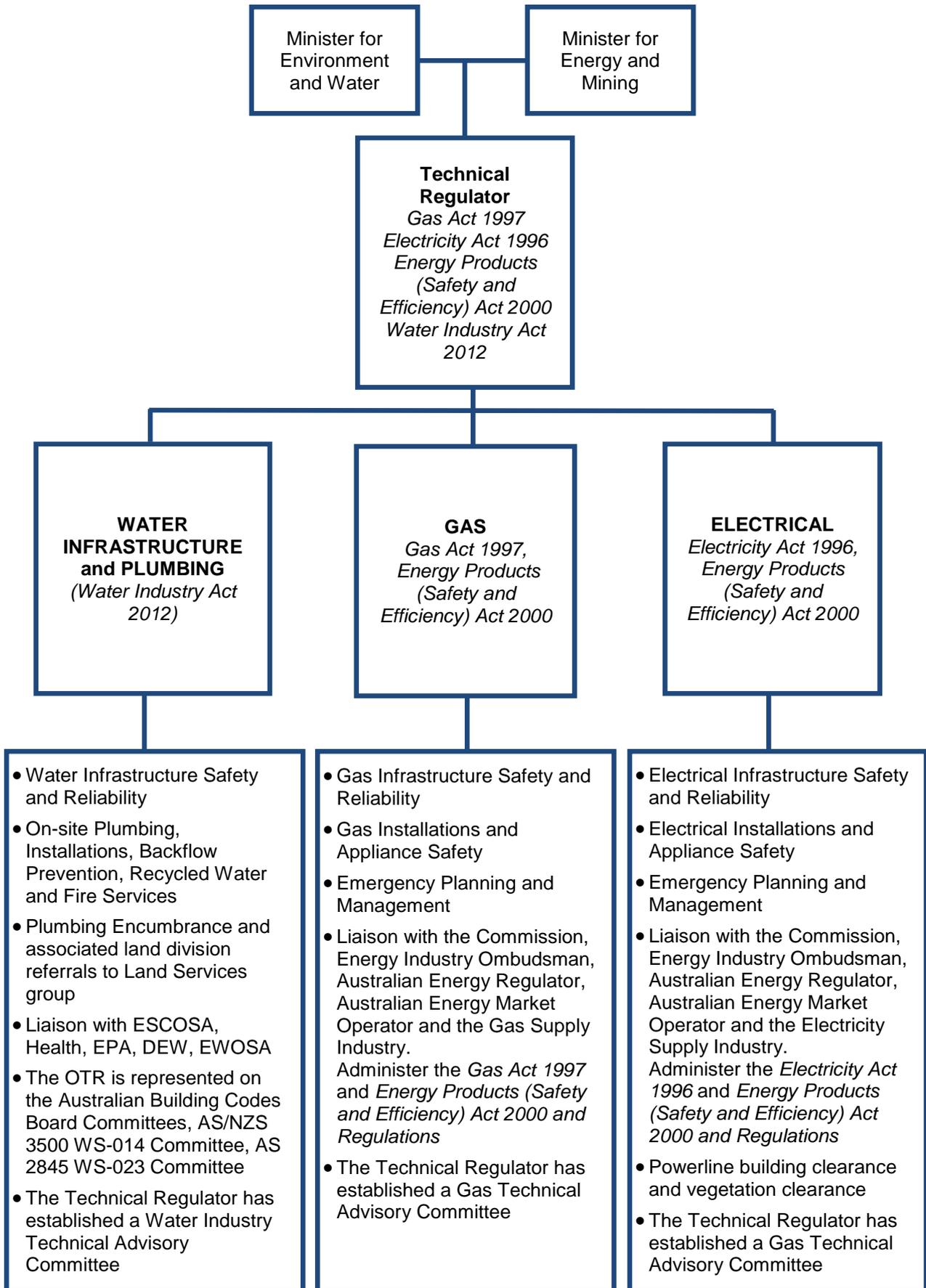
Key Performance Indicator	2017/18	2018/19
Measurement		
2.1 Extent to which meters are being changed over (Gas Measurement Management Plan)		
Number of meters changed:		
Domestic	28,217	35,522
Industrial/commercial	1,108	972
Number of overdue meters with:		
10 years' life	686	1,205
15 years' life	577	1,268
Gas Quality		
3.1 The quantity of gas entering the Distribution System		
Total gas entering the Distribution System (including farm taps) (TJ)	32,055	32,425
3.2 The maintenance of continuous, reliable gas supply		
Number of poor combustion/poor pressure incidents reported	10	3
Number of excursions exceeding one-fifth of the Lower Explosive Limit (LEL)	9	1
Number of excursions below 7 mg/m ³ total odorant	20	9
Total number of excursions from the gas quality requirements, as specified in AS 4564	0	0
Reliability		
4.1 Description and specification of Distribution System and its components		
Length of distribution system (km)	8,279	8,353
4.2 Mains replacement program¹		
Length of mains replaced (km)	206.5	224.6
4.3 Total amount of UAFG lost from the Distribution System as a result of leakage or an activity referred to in Section 82(1) of the Gas Act 1997		
Total UAFG (TJ) (Based on AEMO data as at 30 June of each year)	716	692
4.4 The extent to which the public are reporting gas leaks – mains and inlets services		
Number of public reports of leaks (mains and services, excluding third party damages)	1,986	1,673
Percentage of publicly reported gas leaks where gas leak was found	85%	87%
Number of leaks detected by Leakage Surveys (per km of surveyed mains)	0.24 ²	0.27 ³
4.5 Extent of Training		
Percentage of refresher training compliance to scheduled volumes	99%	99%
Connections		
5.1 Extent of access to system as required by return		
Number of consumer connections (at 30 June each year)	448,230	454,416
Number of new connections completed	8,732	7,979

¹ Does not included decommissioned mains km

² 2017/18 value excludes HDPE

³ 2018/19 value excludes HDPE

Appendix 2: OTR Background



Appendix 3: Example of paper Certificates of Compliance for each industry

Note: Work commenced after 1 July 2018 must be certified using an electronic Certificate of Compliance.

 GAS CERTIFICATE OF COMPLIANCE E014251	
As required by the Technical Regulator under the Gas Act 1997 and Regulations 2012	
Dear Customer, Any new work, alterations or additions to a gas installation, including appliances, must be performed by a Licensed Gas Contractor or Gas Fitter. Please contact the contractor listed below should you require any information about the work set out in this form.	
PLEASE USE BALLPOINT PEN AND WRITE CLEARLY AND FIRMLY	
Owner/Builder Name Mr/Ms <u>S. Sweet</u>	Phone <u>8555 5555</u>
Installation Address <u>123 Lollipop Lane</u> <u>ADELAIDE 5000</u>	<input type="checkbox"/> Rental <input checked="" type="checkbox"/> Established <input type="checkbox"/> New Home
Postal Address <i>(if not as above)</i>	Date Installation Work Completed <u>30/6/2013</u>
TYPE OF WORK <input checked="" type="checkbox"/> New Installation <input type="checkbox"/> Alteration/Addition involving: <input type="checkbox"/> Composite Pipe <input type="checkbox"/> Reversion Fittings <input type="checkbox"/> Labels <input type="checkbox"/> Consumer Pipework <input type="checkbox"/> Appliance Installation <input type="checkbox"/> Conversion <input type="checkbox"/> Other (describe)	TYPE OF SUPPLY AND PREMISES <input checked="" type="checkbox"/> Natural Gas <input type="checkbox"/> LPG: <input type="checkbox"/> Insitu Fill cylinders <input type="checkbox"/> Exchange cylinders <input type="checkbox"/> House/Domestic <input type="checkbox"/> Flat/Unit <input type="checkbox"/> Shop <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Farm <input type="checkbox"/> Caravan Park <input type="checkbox"/> Marine/Houseboat <input type="checkbox"/> Recreational Vehicle (Reg'n No.....) <input type="checkbox"/> Swimming Pool <input type="checkbox"/> Other (describe)
TYPE OF INSTALLATION <input checked="" type="checkbox"/> Water Heater Replacement Make <u>RHEEM</u> Capacitylitres Model <u>STELLAR 330</u> <input type="checkbox"/> Cooking/Heating appliance Make Model <input type="checkbox"/> Type B Appliance (defined in AS/NZS5601 / AS3814)	
DIAGRAM AND NOTES (attach additional sheets if required) <u>Instal a Rheem Stellar 330 Gas hws.</u>	
FAULTS IDENTIFIED AND BROUGHT TO CUSTOMER'S ATTENTION _____	
DETAILS OF CONTRACTOR Business Name <u>Dewey Cheatem & Howe Gasfitters</u> Telephone <u>8999 9999</u> Address <u>456 Gumdrops Ave</u> Mobile <u>ADELAIDE 5000</u> Licence Number (include prefix) <u>PGE 0001</u>	
TEST/CHECK CERTIFICATE I certify that I have carried out the following tests/checks on the gas installation work detailed in this certificate and the results satisfy the requirements of the Gas Act 1997 and Regulations 2012, or I have placed a defect tag on it and noted it in 'Faults Identified' field above.	
<input checked="" type="checkbox"/> Test for soundness <input checked="" type="checkbox"/> Commissioned to manufacturer's requirements	
GAS FITTER Name <u>M. Howe</u> Signature <u>[Signature]</u> Registration Number <u>PGE 0001</u> Date <u>30/6/2013</u>	
I certify that auxiliary water plumbing work I have carried out meets the requirements of the Water Industry Act 2012 and Regulations thereunder.	
PLUMBING WORKER Name Signature Registration Number Date	
I certify that auxiliary electrical work I have carried out meets the requirements of the Electricity Act 1996.	
RESTRICTED ELECTRICAL WORKER Name Signature Registration Number Date	
I certify that gas fitting work is in compliance with the Gas Act 1997 and Regulations 2012, auxiliary water plumbing work in compliance with the Water Industry Act 2012 and Regulations thereunder, and auxiliary electrical work in compliance with the Electricity Act 1996.	
CONTRACTOR Name <u>[Signature]</u> Signature <u>M. Howe</u> Date <u>30/6/2013</u>	



Office of the Technical Regulator

PLUMBING CERTIFICATE OF COMPLIANCE

Issued pursuant to a scheme made under section 69(2) of the *Water Industry Act 2012*

BOOKING NO/S: **111111, 222222, 333333**..... CERTIFICATE NO: **000000D**

OWNER/CLIENT: **Mr Joe Citizen**COUNCIL NAME: **City of Adelaide**

HOUSE NO: **1**.....LOT NO: **1**STREET NAME: **Adelaide** TYPE: (e.g. AVE) **Street**..

SUBURB: **Adelaide** TYPE OF PREMISES: **Commercial**

NOTES: (continue on separate sheet if required).....

- INSTALL Sanitary Plumbing Cold Water Service Non-Drinking Water Service
- ALTER Sanitary Drains Heated Water Service Rainwater Supply System
- REPLACE CWMS/Other Other

SANITARY PLUMBING:

- New Installation
- W/C Kitchen
- Bathroom En-suite
- Soil Stack Laundry
- Trade Waste Replacement of Sanitary Fixtures

HEATED WATER:

- Make:
- Model No:
- Capacity in Litres:
- Gas Supply ▶ Reticulated ▶ Bottled
- Electric
- Solar
- Mains Pressure
- Gravity Fed
- Instantaneous
- Heat Pump

SHOWER HEAD FLOW RATE:
Shower Head Flow ≤ 9 L/min ▶ Yes

- NON-DRINKING WATER SERVICE:**
- In-Wall In-Ground Cross Connection/Separation Test

FIRE FIGHTING WATER SERVICE: (a Fire Service Installation Report must be included with this form)

- TESTABLE BACKFLOW PREVENTION DEVICE** ▶ Install

- ON-SITE WASTEWATER DISPOSAL:** ▶ Install ▶ Service
- Sub-Surface Disposal System Septic Tank Aerobic or Other Treatment System
- On-Site Recycled Water Irrigation

- TEMPERATURE CONTROL:** ▶ Install
- Tempering Valve Thermostatic Mixing Valve Other

Part A - PLUMBING WORKER: I certify that the plumbing and equipment referred to above, complies with the *Water Industry Act 2012* and/or the *South Australian Public Health Act 2011* including Regulations and Standards thereunder as applicable, and the work falls within the terms of my registration, under the *Plumbers, Gas Fitters & Electricians Act 1995* (PGE Act) and any other applicable legislative and regulatory requirements.

Name: **Perseus Plumber**
Signature: *Perseus Plumber* Lic/Reg No: **PGE 111111** Date: **1 January 2016**..

Part B - PLUMBING CONTRACTOR: I certify that the plumbing and equipment referred to above, complies with the *Water Industry Act 2012* and/or the *South Australian Public Health Act 2011* including Regulations and Standards thereunder as applicable, and the work falls within the terms of my licence under the PGE Act and any other applicable legislative and regulatory requirements. (If the Plumbing Worker and the Plumbing Contractor is the same person, that person must complete both Parts A & B of his Certificate of Compliance).

Print Name: **Pegasus Plumber** Company Name: **South Australian Plumbing Pty Ltd.**
Signature: *Pegasus Plumber* Licence No: **PGE 222222** Date: **1 January 2016**..
Address: **2 South Australia Road Adelaide SA 5000**
Telephone: **08 8888 8888** Mobile: **0488 888 888** Email/Fax: **08 8888 8889**

OFFICE OF THE TECHNICAL REGULATOR COPY:
This certificate is to be provided to Office of the Technical Regulator within 7 days of completing the work.

Appendix 4: Example of Electronic Certificate of Compliance Form for each industry

ELECTRICAL CERTIFICATE OF COMPLIANCE			
<i>As required by the Electricity Act 1996</i>			
			
Certificate Number:		E0000000	
Owner/Client name	Ms Jane Doe		
Installation Address	1 Doe St, ADELAIDE, SA 5000		
Premises Type	House/Domestic		
Date of Electrical Work	Started: 01/01/2018	Finished: 01/01/2018	Submitted: 01/01/2018
Network Operator	SAPN		
SECTION A - JOB DETAILS			
Work Category	Work Type	Work Performed	
New Install	Other	Install 2 gang socket outlet to north wall in bedroom 2 on existing RCD protected power circuit P2.	
SECTION B - WARNING : Owners & operators of electrical installations must take reasonable steps to ensure that the electrical installation is safe. Maximum penalty \$250,000. Listed below are any items considered to be unsafe or requiring remedy.			
Risk Assessment	None Observed		
REGISTERED ELECTRICAL WORKER: I certify that the work detailed in Section A complies with and has been inspected and tested by me as required by the <i>Electricity Act 1996</i> .			
Name	John Doe		
Licence Number	PGE0001		
Date Certified	13/02/2018		
CONTRACTOR/AUTHORISED PERSON: I certify that I am the contractor/duly authorised agent of the contractor and have or had a supervisory role in relation to the worker above and I am satisfied that the standards and requirements of the <i>Electricity Act 1996</i> have been complied with. Also where applicable, I am satisfied that the auxiliary gas fitting and/or water plumbing work detailed above meets the requirements of the <i>Gas Act 1997</i> and Regulations and/or <i>Water Industry Act 2012</i> including Regulations and Standards.			
Name	John Doe		
Business Name	J Doe Electrical		
Licence Number	PGE0001		
Phone/Mobile	0412345678	Email	ian.furness@sa.gov.au
Address	2 Does St, ADELAIDE, SA 5000		
Date Certified	13/02/2018		
The Technical Regulator does not endorse the contents of this eCoC. The Technical Regulator does not accept responsibility for the truth or accuracy of the contents of this eCoC and will not be held liable for any loss or damage suffered in consequence of reliance upon the contents of this eCoC.			
Page: 1 of 2			
Office of the Technical Regulator, GPO Box 320 ADELAIDE SA 5001 Email: otrmail@sa.gov.au Office: (08) 8226 5518 Fax: (08) 8226 5529 Information for owners and operators please visit: www.sa.gov.au/otr			

GAS CERTIFICATE OF COMPLIANCE

under the Gas Act 1997

Certificate Number: **G9999999**

Owner/Client name	Joe Owner		
Installation Address	1 Example Rd, ADELAIDE, SA 5000		
Premises Type	House/Domestic		
Date of Work	Started: 03/01/2018	Finished: 04/01/2018	Submitted: 04/01/2018
Council	Adelaide City Council		

SECTION A - JOB DETAILS

Work Category	Work Type	Work Performed
New Install	Consumer Pipework	Composite Labels Fitted and Reversion Fitting Installed - No Copper Gas Supply: NG Metering Pressure: 1.4

SECTION B - WARNING : Owners and operators of gas installations must take reasonable steps to ensure that the gas installation is compliant, safe and safely operated to meet the requirements of the *Gas Act 1997*.

Faults identified and brought to Customer's Attention (Mention if any)	
Have you placed defect tag/s on the faults identified?	N/A
Risk Assessment	None Observed

GAS FITTER: I certify that I have carried out the following tests/checks on the gas installation work detailed in this certificate and the results satisfy the requirements of the *Gas Act 1997* and Regulations, or I have placed a defect tag on those faults noted in the 'Faults Identified' field above.

Test for soundness	Yes
Commissioned to manufacturer's requirements	Yes
Name	Example Worker
Licence Number	PGE000111
Date Certified	04/01/2018

CONTRACTOR/AUTHORISED PERSON: I certify that gas fitting work is in compliance with the *Gas Act 1997* and Regulations. Also where applicable, I am satisfied that the auxiliary electrical work and/or water plumbing work detailed above meets the requirements of the *Electricity Act 1996* and Regulations and/or *Water Industry Act 2012* including Regulations and Standards.

Contractor Name	Example Contractor		
Business Name	Example Contracting		
Licence Number	PGE1917		
Phone/Mobile	0489765432	Email	contractor@email.com
Address	11 WAYMOUTH STREET, ADELAIDE, SA 5000		
Date Certified	04/01/2018		

The Technical Regulator does not endorse the contents of this eCoC. The Technical Regulator does not accept responsibility for the truth or accuracy of the contents of this eCoC and will not be held liable for any loss or damage suffered in consequence of reliance upon the contents of this eCoC.

Page: 1 of 2

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Information for owners and operators please visit: www.sa.gov.au/otr

PLUMBING CERTIFICATE OF COMPLIANCE

under the Water Industry Act 2012

Certificate Number: **P100179**

Owner/Client name	John Smith		
Installation Address	11 WAYMOUTH STREET, ADELAIDE, SA 5000		
Premises Type	House/Domestic		
Date of Work	Started: 27/11/2017	Finished: 27/11/2017	Submitted: 27/11/2017
Council	Adelaide City Council		

Work Category	Work Type	Work Performed	
New Install	Above Ground Sanitary Plumbing	En suite on first floor	
New Install	Heated Water	Make/Model: ACME Hot Water Capacity: 20 litres Serial No.: M123456	Heated Water Type: Instantaneous Energy Source: Gas
New Install	Non Drinking Water System	In-ground	
New Install	Rainwater System	Above-ground storage tank	
New Install	Sanitary Plumbing	Bathroom Ensuite Kitchen Laundry WC	

REGISTERED PLUMBING WORKER: I certify that the plumbing and equipment referred to above complies with the *Water Industry Act 2012* including Regulations and Standards and/or the *South Australian Public Health Act 2011*.

Name	Plumbing Worker
Licence Number	PGE584
Date Certified	27/11/2017

RESTRICTED GAS WORKER: I certify that auxiliary gas work I have carried out meets the requirements of the *Gas Act 1997* and Regulations.

Name	Plumbing Worker
Licence Number	PGE584
Date Certified	27/11/2017

CONTRACTOR/AUTHORISED PERSON: I certify that the plumbing and equipment referred to above complies with the *Water Industry Act 2012* including Regulations and Standards and/or the *South Australian Public Health Act 2011*. Also where applicable, I am satisfied that the auxiliary gas fitting and/or electrical work detailed above meets the requirements of the *Gas Act 1997* and Regulations and/or *Electricity Act 1996* including Regulations and Standards.

Name	Greg Contractor		
Business Name	Plumbing Contractor		
Licence Number	PGE1228		
Phone/Mobile	0411111111	Email	worker16@test.com
Address	11 WAYMOUTH STREET, ADELAIDE, SA 5000		
Date Certified	27/11/2017		

The Technical Regulator does not endorse the contents of this eCoC. The Technical Regulator does not accept responsibility for the truth or accuracy of the contents of this eCoC and will not be held liable for any loss or damage suffered in consequence of reliance upon the contents of this eCoC.

Office of the Technical Regulator, GPO Box 320 ADELAIDE SA 5001 | Email: otr.plumbing@sa.gov.au | Office: 1300 760 311
Information for owners and operators please visit: www.sa.gov.au/otr

Appendix 5: Electrical Products

A5.1. Proclaimed Electrical Products

Following are the 59 classes of products currently proclaimed under the *Energy Products (Safety & Efficiency) Act 2000* for safety purposes:

- | | |
|--|---|
| 1 Air conditioner incorporating flammable refrigerant | 30 Kitchen Machine |
| 2 Appliance Connector | 31 Lawn Care Appliance |
| 3 Arc Welding Machine (stick and gas shielded) | 32 Liquid Heating Appliance |
| 4 Bayonet Lampholder | 33 Luminaire – Portable Type |
| 5 Bayonet Lampholder Adaptor | 34 Massage Appliance |
| 6 Blanket | 35 Microwave Oven |
| 7 Bread Toaster | 36 Miniature Over-Current Circuit Breaker |
| 8 Building wiring cable | 37 Outlet Device |
| 9 Clothes Dryer | 38 Plug |
| 10 Control or Conditioning Device | 39 Power Supply or Charger |
| 11 Cooking Appliance – Portable Type | 40 Projector |
| 12 Cord Extension Socket | 41 Range |
| 13 Cord-Line Switch | 42 Range Hood |
| 14 Decorative Lighting Outfit (chains) | 43 Razor/Hair Clipper |
| 15 Dishwashing Machine | 44 Refrigerating Appliance |
| 16 Double-capped light emitting semiconductor lamp | 45 Residual Current Device |
| 17 Edison Screw Lampholder | 46 Room Heater and Room Heater, Thermal Storage |
| 18 Fan | 47 Sewing Machine |
| 19 Fence Energiser | 48 Socket-Outlet |
| 20 Flexible Heating Pad | 49 Soldering Iron |
| 21 Floor Polisher/Scrubber | 50 Supply Flexible Cord |
| 22 Fluorescent Lamp Ballast, Electronic Lamp Ballast (including compact fluorescent) | 51 Swimming Pool/Spa Equipment |
| 23 Fluorescent Lamp Starter | 52 Television Receiver |
| 24 Hair Care Appliance | 53 Therapeutic Lamp |
| 25 Hedge Clipper | 54 Tool, Portable type |
| 26 Immersion Heater Aquarium Heaters | 55 Vacuum Cleaner |
| 27 Insect Electrocuter | 56 Wall Switch |
| 28 Inspection Hand Lamp | 57 Washing Machine |
| 29 Iron, Garment Steamers | 58 Water Bed Heater |
| | 59 Water Heater |

A5.2. Proclaimed products requiring MEPS Registration

- Air-conditioner – close control
- Air conditioner – refrigerative
- Distribution transformer
- ELV Lighting converter
- Electric motor three phase
- Electric water Heater
- External power supply
- Fluorescent lamp ballast
- Freezer
- Gas water heater
- Incandescent lamp
- Linear fluorescent lamp
- Liquid-chilling package
- Refrigerated display cabinet
- Refrigerator
- Refrigerator/freezer
- Self-ballasted compact fluorescent lamp
- Set top box
- Television set
- Water heater

A5.3. Proclaimed Products requiring Energy Efficiency Labelling

- Air conditioner – refrigerative
- Clothes dryer
- Dishwashing machine
- Fluorescent lamp ballast
- Freezer
- Refrigerator
- Refrigerator-freezer
- Television set
- Washing machine

Appendix 6: Electrical definitions, formulas and units

A6.1. Definitions

Availability	Percentage of time over a year when generating plant was available (after megawatt losses due to outages are taken into account); based on megawatt hours.
Cogeneration	Production of useful heat and electricity from the same quantity of fuel.
Distribution Licence	An industry code administered by ESCOSA (adherence to the Code is a condition of a distribution licence).
Meshed	Part of a ring main where failure at one point can be isolated and supply system backfed from elsewhere in the system as opposed to radial system, which has only one point of supply.
Network Outage Time	A measurement of the time that the network cannot supply energy
Reliability	Indication of capability of electricity supply system to meet demand; measured by the number of hours when plant was out of service.
SAIDI	The total of the duration of each customer interruption (in minutes) divided by the total number of customers averaged over the year.
SAIFI	The total number of customer interruptions divided by the average total number of customers over the year.
Generation	Production of electricity in power stations, solar arrays and wind farms.
Transmission	Transport of electricity to the distribution network by high voltage transmission lines.
Distribution	Delivery of electricity to consumers through the network
Reliability of supply	Ability to maintain sufficient generation or flow of electricity to meet the demand of end users.
Security of supply	Ability to provide responses to the failure of plant and equipment so as to continue the supply of electricity.
Transmission	Circuit availability Measured by the hours all circuits are available expressed as a percentage of the total possible hours they could be available.
Distribution reliability	Total duration of customer supply interruptions (minutes off supply) per customer per annum, averaged over the year Measured by the System Average Interruption Duration Index (SAIDI).

A6.2. Performance Indicator Definitions

Planned outages	Planned outages generally involve overhaul work, either on a unit or components, planned well in advance, usually by more than a year.
Maintenance outages	Maintenance outages require the removal of a unit or component from service for work which can be deferred beyond the next weekend but must be carried out before the next planned outage.
Forced outages	Forced outages involve the removal of a unit or component from service for work that cannot be deferred beyond the next weekend. The term "equivalent" refers to the conversion of partial outages to equivalent full outages.

Starting reliability Starting reliability is the percentage of time the plant actually starts when called upon. This is only reported for power stations classed as peaking plants. For base load plants, starting reliability is not applicable as the plant is run continuously.

A6.3. Performance Indicator Formulae

Planned Outage Factor

$$\frac{\text{MWh out of service due to planned outage} \times 100\%}{\text{Installed plant capacity (MW)} \times 8,760 \text{ hours}}$$

Maintenance Outage Factor

$$\frac{\text{MWh out of service due to maintenance outages} \times 100\%}{\text{Installed plant capacity (MW)} \times 8,760 \text{ hours}}$$

Equivalent Forced Outage Factor

$$\frac{\text{MWh out of service due to forced outage} \times 100\%}{\text{Installed plant capacity (MW)} \times 8,760 \text{ hours}}$$

Equivalent Availability Factor

$$\frac{\text{Installed plant capacity (MW)} \times 8,760 - \text{MWh losses due to outages} \times 100\%}{\text{Installed plant capacity (MW)} \times 8,760 \text{ hours}}$$

Medical Injury Frequency Rate

$$\frac{\text{Number of occurrences in the period}}{\text{Number of hours worked in the period}} \times 1,000,000$$

A6.4. Units

J	Joule – unit of energy
W	watt (1W = 1 joule/second) – unit of power
Wh	watt-hour (1Wh = 3,600J) – unit of electrical energy
V	Volt – unit of Voltage
VAR	Volt Amp Reactive – unit of reactive power

A6.5. Prefixes

m (milli)	10 ⁻³	
k (kilo)	10 ³	(thousand)
M (mega)	10 ⁶	(million)
G (giga)	10 ⁹	(billion)
T (tera)	10 ¹²	(trillion)

Appendix 7: Plumbing Standard

WATER INDUSTRY ACT 2012

Plumbing Standard

Technical Regulator

This Standard varies the Plumbing Standard published in the Gazette on 9 January 2014.

This Standard is published by the Technical Regulator pursuant to section 66 of the *Water Industry Act 2012* (the Act). This Standard comes into effect on the date on which it is gazetted.

This Standard relates to plumbing, including plumbing work or any equipment, products or materials used in connection with plumbing.

This Standard applies to the following persons:

1. licensed plumbing contractors (under the *Plumbers, Gas Fitters and Electricians Act 1995*) contracting for plumbing work.
2. licensed building work contractors (under the *Building Work Contractors Act 1995*) contracting for plumbing work.
3. registered plumbing workers (under the *Plumbers, Gas Fitters and Electricians Act 1995*) carrying out plumbing work.

The above mentioned persons, must comply with the following requirements:

(a) Relevant components of the National Construction Code Volume 3 (Plumbing Code of Australia) (including any standards referred to therein) as amended from time to time, as follows:

1. Section A Governing Requirements, Section A, Parts A1, A2, A3, A4, A5, A6 and A7;
2. Section B Water Services, Parts B1, B2, B3, B4, B5 and B6;
3. Section C Sanitary Plumbing and Drainage Systems, Parts C1 and C2;
4. Section D Excessive Noise, Part D1;
5. Section E Facilities, Part E1;
6. Schedule 1 State and Territory Variations and Additions, Appendix South Australia- Sections B, C, SA Section F, Schedule 3 and Schedule 4;
7. Schedule 2 Abbreviations and Symbols;
8. Schedule 3 Defined Terms;
9. Schedule 4 List of Referenced Documents;

(b) The requirements outlined in the Government of South Australia Verification Method for an Electric Resistance Storage Water Heater Supplied by On-Site Renewables (Supply).

The Technical Regulator may grant an exemption from this Standard, or specified provisions of this Standard, with or without conditions as the Technical Regulator considers appropriate.

Dated: 23 April 2019

R. Faunt
Technical Regulator

Appendix 8: Scheme for Plumbing Certificates of Compliance

WATER INDUSTRY ACT 2012

TECHNICAL REGULATOR

Scheme under section 69(2)

Plumbing Certificate of Compliance

(1) **Title**

This Scheme is established by the Technical Regulator under section 69(2) of the *Water Industry Act 2012* (the Act) and may be cited as the *Plumbing Certificate of Compliance Scheme*.

(2) **Commencement**

The Scheme will come into operation on 9 January 2017.

(3) **Interpretation**

In the Scheme:

- (a) **contractor** means a plumbing contractor licensed under the *Plumbers, Gas Fitters and Electricians Act 1995* (PGE Act) or a building contractor licensed to contract for plumbing work under the *Building Work Contractors Act 1995*;
- (b) **Electronic Certificate of Compliance** means the electronic Certificate of Compliance approved by the Technical Regulator;
- (c) **equipment** includes pipes, fittings and apparatus and any component of any equipment;
- (d) **Paper Certificate of Compliance** means the Plumbing Certificate of Compliance approved by the Technical Regulator as in operation immediately prior to 9 January 2017;
- (e) **plumbing** means water plumbing, sanitary plumbing or draining work on the customer's side of any connection point or any other work defined in the regulations.
- (f) **plumbing worker** means a plumbing worker registered under the PGE Act;

(4) **Application**

- (1) The Electronic Certificate of Compliance must be used by contractors and plumbing workers.
- (2) The Electronic Certificate of Compliance must be used to verify that plumbing and equipment are compliant with the *Water Industry Act 2012* and/or the *South Australian Public Health Act 2011* including regulations and standards as applicable, and the work falls within the terms of the contractor's licence and the worker's registration.

(5) Use of Certificates of Compliance

- (1) The Paper Certificate of Compliance may be used until and including 30 June 2018. Requirements relating to completion of the Paper Certificate of Compliance remain as they were prior to 9 January 2017.
- (2) The Electronic Certificate of Compliance may be used from 9 January 2017, and must be used on and after 1 July 2018.

(6) Completing the Certificate of Compliance

- (1) To complete an Electronic Certificate of Compliance:
 - (a) If you are a plumbing worker employed by a contractor -
 - (i) you must complete the details of the worker sections and provide it to your employing contractor.
 - (b) If you are the contractor employing a plumbing worker -
 - (i) after receiving the Electronic Certificate of Compliance from the plumbing worker you must complete the contractors section.
 - (c) If you are the contractor and the plumbing worker -
 - (i) you must complete both the contractors and workers sections.
 - (d) If you are a plumbing worker and -
 - (i) not operating a plumbing business as a contractor and undertaking work for no financial gain; or
 - (ii) are employed as a plumbing worker to perform plumbing work at the employers place of business –you need only complete the workers sections.
- (2) After completion of the work you must:
 - (a) within 7 days, provide the Electronic Certificate of Compliance to the Technical Regulator and the owner or operator of the installation; and
 - (b) within 28 days, provide the Electronic Certificate of Compliance to the relevant Council if applicable.

(7) Additional required documentation

Where applicable the following must also be provided to the Technical Regulator with the Certificate of Compliance:

- (1) 'internal sanitary drain as constructed drawings' showing the position and dimensions of the pipes, fittings and equipment associated with sanitary drains; and/or
- (2) backflow prevention device commission, inspection and maintenance reports, when commissioning or re-testing backflow prevention devices; and/or
- (3) fire service installation reports.

(8) Copies of Certificate of Compliance

A copy of the Certificate of Compliance must be retained by the contractor for 5 years.

(9) Official forms

A Paper or Electronic Certificate of Compliance must be completed using only an electronic or hard copy form published or produced under the authority of the Technical Regulator.

(10) Variation or revocation of Scheme

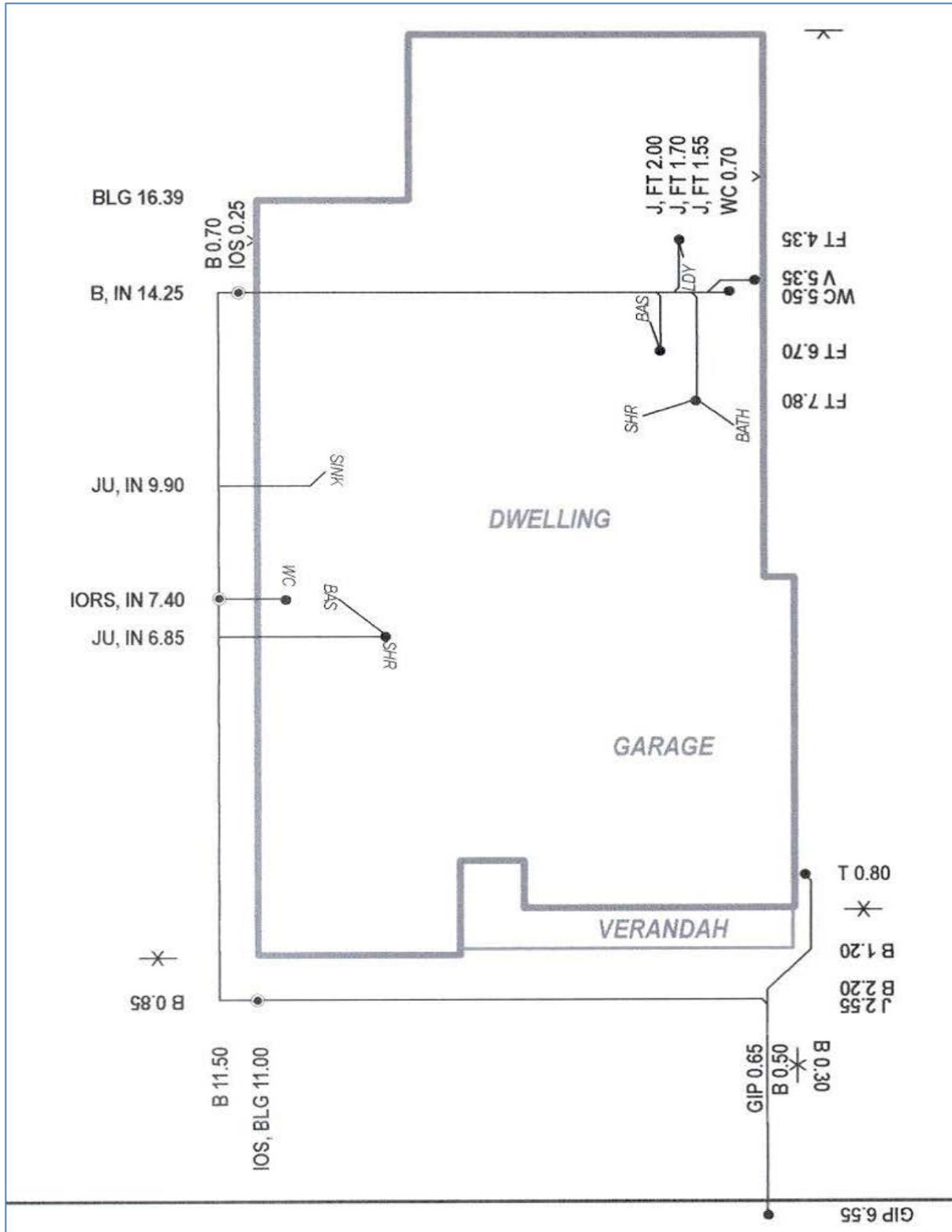
This Scheme may be varied or revoked by the Technical Regulator.

Dated 5 January 2016



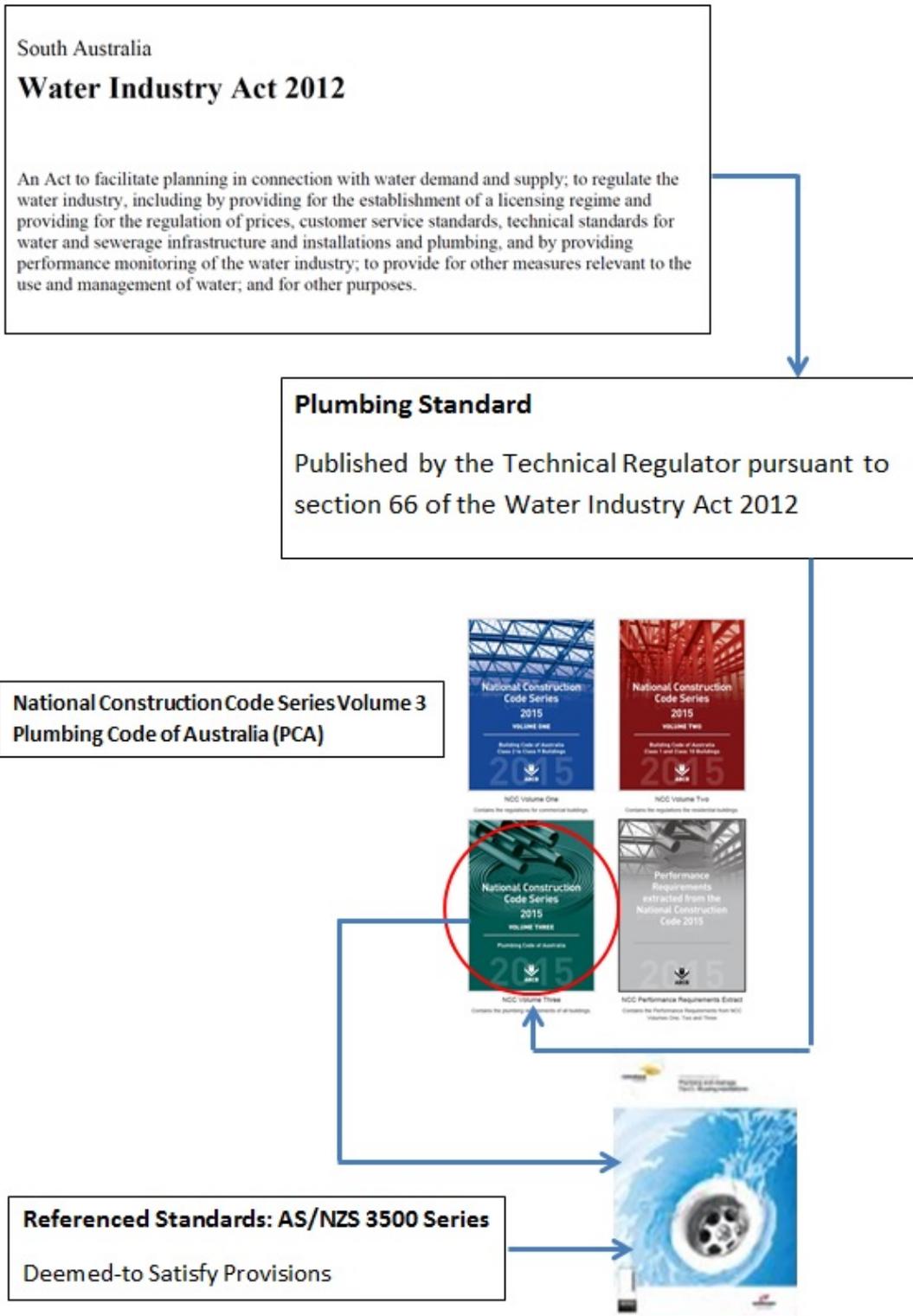
R. FAUNT
TECHNICAL REGULATOR

Appendix 9: Example of Internal Drain as Constructed Drawing



Appendix 10: Plumbing Code within the Regulatory framework

How the Plumbing Code of Australia fits into the Regulatory Framework



Appendix 11: Water Industry Entities and licences

Licensee	Licence category	Service Provided		
		Drinking water	Non-drinking water	Sewerage
Adelaide Hills Council	Intermediate	No	No	Yes
Alano Utilities Pty Ltd	Minor	No	No	Yes
Alexandrina Council	Intermediate	Yes	Yes	Yes
Barossa Council	Intermediate	No	Yes	Yes
Barunga West (District Council of)	Intermediate	No	No	Yes
Berri Barmera Council	Intermediate	No	No	Yes
BHP Billiton Olympic Dam Corporation Pty Ltd	Minor	Yes	no	no
Cape Jaffa Anchorage Essential Services	Minor	Yes	No	Yes
Ceduna (District Council of)	Intermediate	Yes	Yes	Yes
Charles Sturt (The City of)	Minor	No	Yes	No
Clare and Gilbert Valley Council	Intermediate	No	Yes	Yes
Cleve (Arno Bay) (District Council of)	Minor	No	No	Yes
Cleve (Cleve) (District Council of)	Minor	No	No	Yes
Coober Pedy (District Council of)	Minor	Yes	Yes	Yes
Coorong District Council	Intermediate	No	Yes	Yes
Copper Coast (District Council of)	Intermediate	No	No	Yes
Elliston (District Council of)	Minor	Yes	Yes	Yes
Enwave Tonsley Pty Ltd	Intermediate	No	Yes	No
ERA Water	Minor	No	Yes	No
F.B Pipeline Pty Ltd	Minor	Yes	No	No
Fairmont Utilities Pty Ltd	Intermediate	Yes	Yes	Yes
Flinders Ranges Council	Minor	No	No	Yes
Franklin Harbour (District Council of)	Minor	Yes	No	No
Goyder (Burra) (Regional Council)	Minor	No	No	Yes
Goyder (Eudunda) (Regional Council of)	Minor	No	No	Yes
Grant (District Council of)	Intermediate	No	No	Yes
Kangaroo Island Council	Intermediate	No	No	Yes
Karoonda East Murray (District Council of)	Minor	No	No	Yes
Kimba (District Council of)	Minor	No	Yes	Yes
Kingston District Council	Intermediate	No	No	Yes
Light Regional Council	Intermediate	No	Yes	Yes
Lower Eyre Peninsula (District Council of)	Intermediate	No	No	Yes
Loxton Waikerie (District Council of)	Intermediate	No	No	Yes
Mallala (District Council of)	Minor	No	No	Yes
Marion (Corporation of the City of)	Minor	No	Yes	No
Michell Infrastructure Pty Ltd	Minor	No	Yes	No
Mid Murray Council	Intermediate	No	Yes	Yes
Mount Barker (District Council of)	Intermediate	No	Yes	Yes
Mount Remarkable (District Council of)	Intermediate	Yes	No	Yes
Murray Bridge (Rural City of)	Minor	Yes	No	Yes

Naracoorte Lucindale Council	Minor	No	No	Yes
Northern Areas Council	Intermediate	No	Yes	Yes
Onkaparinga (1) (Sewerage)	Intermediate	No	No	Yes
Onkaparinga (2) (Water)	Minor	No	Yes	No
Orroroo Carrieton (District Council of)	Minor	No	Yes	No
Outback Communities Authority	Minor	Yes	no	no
Playford (City of)	Minor	No	Yes	No
Port Adelaide Enfield (City of)	Minor	No	Yes	Yes
Port Augusta City Council	Intermediate	No	Yes	Yes
Port Lincoln (City of)	Minor	No	Yes	No
Port Pirie Regional Council	Intermediate	No	No	Yes
Renmark Paringa Council	Intermediate	No	No	Yes
Robe (District Council of)	Intermediate	No	No	Yes
Robusto Investments Pty Ltd (transferred from Hillrise Investments Pty Ltd)	Minor	No	Yes	No
Roxby Downs (Municipal Council of)	Intermediate	Yes	Yes	Yes
SA Water	Major	Yes	Yes	Yes
Salisbury (City of)	Minor	No	Yes	No
Southern Mallee Regional Council	Intermediate	No	Yes	Yes
Streaky Bay (District Council of)	Intermediate	No	No	Yes
Tatiara District Council	Intermediate	No	Yes	Yes
Tea Tree Gully (City of)	Intermediate	No	Yes	Yes
Tumby Bay (District Council of)	Intermediate	No	Yes	Yes
Wakefield Regional Council	Intermediate	No	No	Yes
Water Utilities Australia Pty Ltd	Minor	No	Yes	No
Wattle Range Council	Intermediate	No	No	Yes
Whyalla City Council	Minor	No	Yes	No
Wudinna District Council	Minor	No	Yes	Yes
Yankalilla (District Council of)	Intermediate	Yes	Yes	Yes
Yorke Peninsula (District Council of)	Intermediate	Yes	No	Yes

Appendix 12: Checklist for SRMTMPs and audits

Office of the Technical Regulator

Internal Audit Checklist

Safety, reliability, maintenance and technical management plans

To be used by water industry entities when completing an annual internal audit of compliance with their safety, reliability, maintenance and technical management plan.

Company				
Date				
1. Introduction	Yes	No	N/A	Comments
Is the Safety, reliability, maintenance and technical management plan (SRMTMP) effective and functional?				
Has the purpose of the SRMTMP changed?				
Have the scope and objectives changed?				
Is the responsible person for the SRMTMP still current?				
Is the Organisational Chart up to date?				
Have any roles and responsibilities for key position/s changed?				
Is the communication strategy for the plan still current?				
Are relevant legislation, codes and standards listed?				
Are the major approvals and licences listed?				
2. Description of the Operation	Yes	No	N/A	Comments
Do the assets summary and the high level descriptions including system / scheme list reflect your current infrastructure?				
Is there additional asset design and operational information?				
Who is responsible for operations?				
3. Operational Safety and Reliability	Yes	No	N/A	Comments
Leadership and Commitment – Has there been any changes to: <ul style="list-style-type: none"> Person responsible for water and/or sewerage infrastructure safety WHS Policy statement Employee selection, competency and training commitment Contractor and end user training commitment 				
Effective Planning – Has there been any changes to: <ul style="list-style-type: none"> Design management approach Design life of plant in line with nominated standards or otherwise Safety in design requirements adopted Procurement systems and processes 				
Controlled Implementation – Has there been any changes to: <ul style="list-style-type: none"> Construction and commissioning management systems Safe operational procedures Maintenance and reliability considerations Decommissioning, demolition and abandonment/disposal Emergency response management 				

Monitoring and Evaluation – Has there been any changes to: <ul style="list-style-type: none"> Incident management, incl. classification, reporting and investigation Document management system Reporting requirements 				
Audit and Review – Has there been any changes to: <ul style="list-style-type: none"> Auditing processes, reviews, and responsibilities, including but not limited to long term evaluation plans 				
4. Formal Safety and Reliability Assessment	Yes	No	N/A	Comments
Has there been any changes to: <ul style="list-style-type: none"> Hazard identification and rating system Risk response mitigation and controls Risk Assessment principles and guidelines 				
5. Asset Management	Yes	No	N/A	Comments
Has there been any changes to: <ul style="list-style-type: none"> Asset management system Change management system Operations and maintenance strategies Maintenance program 				
6. Contract Management	Yes	No	N/A	Comments
Has there been any changes to: <ul style="list-style-type: none"> Contract management system Contract assessment processes Contractor Management, i.e. CMS 				
7. Customer / Public Protocols and Agreements	Yes	No	N/A	Comments
Has there been any changes to: <ul style="list-style-type: none"> Stakeholder communication protocols Public communication protocols Education and notices related to recycled water Supply agreements – statement and/or list of recipients Register of customer contact, issues raised – identified, response 				
8. Compliance Monitoring	Yes	No	N/A	Comments
Has there been any changes to: <ul style="list-style-type: none"> Performance monitoring and compliance structure KPI measurement and reporting processes Periodic operations audits/ Water quality monitoring and compliance Corrective actions and continuous improvement strategies 				
Emergency Response and Incident Reporting	Yes	No	N/A	Comments
Were there any emergencies / incidents? If yes, <ul style="list-style-type: none"> How many? Were the incident/s reported in accordance with OTR requirements? Were the incident/s investigated (internally/externally)? 				
UPDATE OF SRMTMP	Yes	No	N/A	Comments
Has the version table in the SRMTMP been updated and all changes noted?				
Has the updated version of the SRMTMP been provided to the OTR for approval?				

- End of Checklist -

Appendix 13: Glossary and Abbreviations

ABCB	Australian Building Codes Board
AC	Alternating Current
ACCC	Australian Competition and Consumer Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AGA	Australian Gas Association- this is a gas appliance certification body (CAB) proclaimed by the Governor
AGN	Australian Gas Network Limited formally known as Envestra Limited – entity holding a gas distribution licence in South Australia
AHSCA	Association of Hydraulic Services Consultants Australia (South Australia)
AMP	Asset Management Plan
APA Group	Australian Pipeline Group and other associated entities
AS	Australian Standard
AS/NZS	Australian or Joint Australian/New Zealand Standards
AWA	Australian Water Association
BBQ	Barbecue
BCA	Building Code of Australia
BCC	Building Codes Committee
BOM	Bureau of Meteorology
CAB	Conformity Assessment Body
CBD	Central Business District
CBS	Consumer Business Services - The licensing authority in SA
CCASA	Caravan and Camping Association of South Australia
CFS	Country Fire Service
CI	Cast Iron
CO	Carbon Monoxide
COAG	Council of Australian Governments
CoC	Certificate of Compliance
CWMS	Community Wastewater Management Scheme
DC	Direct Current
Deemed-to-Satisfy provisions	The Deemed-to-Satisfy provisions are an optional means of achieving compliance with the mandatory Performance Requirements
DBYD	'Dial Before You Dig' - This telephone (1100) and internet service provides location information on infrastructure, such as gas pipelines, to protect these assets during excavation work
DHW	Department for Health and Wellbeing
DPTI	Departments of Planning, Transport and Infrastructure, formerly DTEI
eCoC	Electronic Certificate of Compliance
ElectraNet	Short form of ElectraNet SA, the trading name of ElectraNet Pty Limited
EMPIA	Electronic Management of Plumbing Inspections and Audits
EPA	Environment Protection Authority
Equipment	Includes - (a) Pipes, fittings and apparatus; and

	(b) any component of any equipment
ERAC	Electrical Regulatory Authorities Council
ESISC	Energy Supply Industry Safety Committee
ESCOSA	Essential Services Commission of South Australia
ETSA	Short form of Electricity Trust of South Australia Utilities (Now known as SA Power Networks)
EWOSA	Energy and Water Ombudsman South Australia
FIA	Fire Industry Association
Global Mark	A gas appliance certification body (CAB) proclaimed by the Governor
GMMP	Gas Measurement Management Plan
GTRC	Gas Technical Regulators Committee
HDPE	High Density Polyethylene
HIA	Housing Industry Association
HV	High voltage
IAPMO	International Association of Plumbing and Mechanical Officers – a gas appliance certification body (CAB) proclaimed by the Governor
IEEE	The Institute of Electrical and Electronics Engineers
IGA	Inter Government Agreement
Incident	Described in the <i>Gas Regulations 2012</i> as an ‘accident’; an event causing death, injury or property damage; a gas related incident is when natural gas or LP gas or their products of combustion is (or is suspected of being) directly involved
In-house	Testing performed by the operator, using their own facilities, such as meter testing performed at the laboratory of the APA Group depot
In-testing	Removal of a meter from service and test in a laboratory; if the meter is found to be satisfactory, it can be made available for re-use (if not, it will be repaired or scrapped)
kPa	Kilo Pascal (1000 Pascals) – unit of pressure
KPI	Key Performance Indicator
LED	Light Emitting Diode
LGA	Local Government Association
LMP	Leakage Management Plan
LNG	Liquefied Natural Gas
LP gas	Liquefied Petroleum Gas
LSG	Land Services Group
LV	Low voltage (less than 1000 volts; nominally 400/230 volts)
MAP	Moomba-Adelaide Pipeline – Gas pipeline that supplies natural gas to Adelaide from the Moomba processing plant
MBA	Master Builders Association
MCE	Ministerial Council on Energy
MED	Major Event Day
MEPS	Minimum Energy Performance Standards
MFS	Metropolitan Fire Service
ML	Mega Litre
MPA	Master Plumbers Association
MRA	Mutual Recognition Agreement or Act allowing legal recognition in one jurisdiction of product approval or testing procedures in another jurisdiction

NATA	National Association of Testing Authorities
NCC	National Construction Code
NEM	National Electricity Market
NERL	National Energy Retailer Law
NGERAC	National Gas Emergency Response Advisory Committee
OTR	Office of the Technical Regulator
PCA	Plumbing Code of Australia
PCA pipeline	Port Campbell to Adelaide Pipeline
PCC	Plumbing Code Committee
PIR	Property interest reports
Plumbing	(a) water plumbing work, sanitary plumbing work or draining work on the Customer's side of any connection point. (b) any other work brought within the ambit of this definition by the regulations;
POL connection	'POL' is a type of valve for LP gas cylinders and the most common type in Australia. The 'POL' is an acronym for the company that first produced the valves, Prest-O-Lite.
PTAC	Plumbing Technical advisory committee
QSN link	Queensland, South Australia and New South Wales link – pipeline from South West Queensland to the Moomba gas plant in SA
RCM	Regulatory Compliance Mark
RDNS	Royal District Nursing Society
Regulation Roundup	Bi-annual newsletter of the Technical Regulator to the gas, electrical and plumbing industry
RIS	Regulatory Impact Statement
Roadshow	Technical presentation by the Technical Regulator to gas fitters, provided free of charge annually in Adelaide city and regional centres
RVMAA	Recreational Vehicle Manufacturers Association Australia
SA	South Australia
SA Water	South Australian Water Corporation
SafeWork SA	Government department that administers the Dangerous Substances Act
SAIDI	System Average Interruption Duration Index
SAIG	Standards Australia International Global-this is among other things a gas appliance certification body (CAB) proclaimed by the Governor
SAILIS	South Australian Integrated Land Information System
SAP	Safety Awareness Plan
SAPN	SA Power Networks - Operator of the electricity distribution network in South Australia
SAPOL	South Australian Police
SCADA	Supervisory Control and Data Acquisition
SCO	Senior Committee of Officials
SEAGas	South East Australia Gas Pipeline – Gas pipeline that supplies natural gas from Victoria to Adelaide
SEPS	South East Pipeline System: a lateral gas pipeline off the SEA Gas pipeline that supplies natural gas to the Mt Gambier region
SRMTMP	Safety, Reliability, Maintenance and Technical Management Plan

Standards	Standards are either Australian or joint Australian and New Zealand Standards, as issued by Standards Australia (or previously published by Australia Gas Association).
STEDS	Septic Tank Effluent Disposal Scheme
STTM	Short Term Trading Market
SWE	Significant Weather Event
SWER	Single Wire Earth Return (19kV rural distribution feeder)
SWQ	South West Queensland
TAC	Technical Advisory Committee
TAFE	Training and Further Education
TGC	Tamar Gas Certification
the Commission	Essential Services Commission of South Australia
TJ	Terajoule (one million megajoules) – unit of energy
TOR	Terms of Reference
Type A	Mass produced, gas appliances, primarily domestic appliances, which are pre-certified by testing prior to sale and installation
Type B	Gas appliances, primarily industrial appliances, which must be certified on site to AS 3814
UAFG	Unaccounted for gas – difference between the quantity of natural gas measured into the network and the quantity measured out at consumers' meters; the difference may be due to leaking gas, differences in meter reading times, meter inaccuracy, gas theft, line pack differences and gas lost during commissioning of pipelines
UPS	Unprotected Steel pipe
USAIDI	Unplanned System Average Interruption Duration Index
WITAC	Water Industry Technical Advisory Committee
WSAA	Water Services Association of Australia