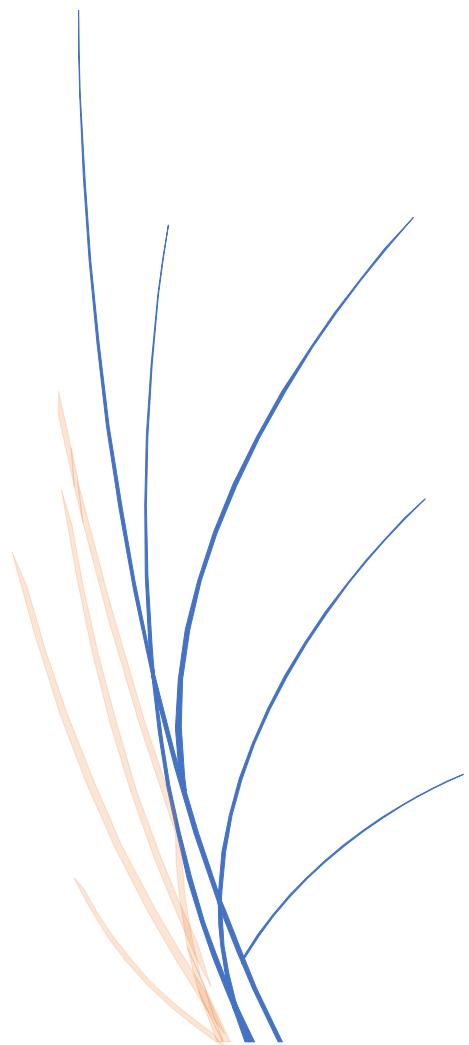


Annual Report of the Technical Regulator 2021-2022

Technical Regulator
South Australia



Annual Report of the Technical Regulator 2021-22

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

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

General Activities of the Office of the Technical Regulator

Overall Activities

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 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. 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](#). 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 safety and technical requirements and which defines 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 how 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: electricity, gas, and water.

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 entity's annual internal audits, the Technical Regulator completes independent safety and technical audits to verify the accuracy of information provided in, 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 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 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, injury to a person which requires 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 the 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. OTR personnel may be called as witnesses in any subsequent legal action.

2.4.3. 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. See Appendix 3 for an example of an electrical, gas and plumbing electronic Certificate of Compliance.

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 electronic Certificates of Compliance (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 a professional registration/licence number and expiry date as well as an email address, a password and contractor/worker details.

Overall, the system is considered more flexible, being on a digital form, and more professional, with 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](#).

2.5. 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 these committees is to provide advice to the Technical Regulator, either on their 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 several Australian Standards and joint Australian and New Zealand Standards Committees, the Australian Building Codes Board's Plumbing Code Committee and International Standards. Committees relate to electrical, plumbing and gas products, design, installation and commissioning of electrical installations, gas installations, on-site plumbing installations, and design, operations, and maintenance of electrical, gas and water infrastructure.

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. When required, the OTR has several staff members available to be 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 forecast to be balanced by electricity generation, the Technical Regulator may 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 as the distribution network service provider, ElectraNet as the transmission network service provider, and AEMO as the electricity market operator. The list sets out the electrical circuits which should be tripped 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 also has 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, for 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. AEMO may also implement the Gas Supply Guarantee process to make gas available to meet peak demand periods in the National Electricity Market. 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 and PEER Vocational Education, Employment and Training (VEET) about tradespeople training curriculums and competencies (CBS regulates the licensing of tradespeople under the *Plumbers, Gas Fitters 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 a bi-annual 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, Regulation Roundup is 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

5.4.1. Proactive awareness campaign

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

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.
- A safety switch should be tested twice a year.
- Christmas lights should be checked for faults prior to being used.
- Avoid scalding from hot water.

The campaigns are 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 in Figure 2.



Figure 2: Example of safety awareness campaign advertisements

5.4.2. Reactive awareness campaign

Reactive safety awareness campaigns are undertaken by the Technical Regulator and usually take 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.

5.4.3. OTR's Website

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

- All technical information for [electrical, gas, water, sewerage and plumbing](#).
- Consumer information for [gas, electricity and hot water safety](#).

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 performed by an external contractor using computer assisted telephone interview and online surveys. Over the last three years, approximately 400 online surveys were conducted, 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 SA

There is a Memorandum of Understanding (MOU) in place between the Technical Regulator and the Energy and Water Ombudsman SA (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. Advice may be sought on customer complaints received by the EWOSA that has 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.
- 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.
- Serec — A Subsidiary Of Electrité 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 Generation

In South Australia, the major entities responsible for scheduled generation supply a total installed nameplate capacity of 3,180.3 megawatts (MW). Natural gas is the source of fuel for the majority of the generators.

Table E1: Scheduled Generation with nameplate capacity exceeding 50 MW operation in 2021-22

Power Station	Fuel	Owner	Capacity (MW)
Angaston	Diesel	Lumo Generation SA Pty Ltd	50
Barker Inlet	Natural Gas Pipeline	AGL Barker Inlet Pty Ltd	210
Dry Creek GT	Natural Gas Pipeline	Synergen Power Pty Ltd	156
Hallett GT	Natural Gas Pipeline	EnergyAustralia	239.7
Ladbroke Grove	Natural Gas Pipeline	Origin Energy Power Limited	80
Hornsdale Battery	N/A (Battery)	Neoen	150
SAGT North	Diesel/Natural Gas Pipeline	SA Power Networks/Nexif Energy	154
SAGT South	Diesel/Natural Gas Pipeline	Iberdrola Australia SAGT Pty Ltd	123
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	50
Port Stanvac 1	Diesel	Lumo Generation SA Pty Ltd	57.6
Quarantine	Natural Gas Pipeline	Origin Energy Power Limited	128
Snuggery	Diesel	Synergen Power Pty Ltd	63
Torrens Island A	Natural Gas Pipeline	AGL Energy	120
Torrens Island B	Natural Gas Pipeline	AGL Energy	800
Total			3,180.3

Reference: AEMO: NEM Generation Information (for SA)

7.1.3. Renewable Generation

South Australia's generation mix includes a high proportion of renewable energy technology. Currently, there are 18 wind generation licenses with a total output capacity of 2,243 MW.

The information for the wind farm capacities below are sourced from the AEMO publication NEM Generation information (for SA) and the Commission Generation Licenses website.

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

Power Station	Fuel	Capacity (MW)
Bungala One	Solar	135
Canunda Wind Farm	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
Hornsdale Wind Farm Stage 1	Wind	102.4
Hornsdale Windfarm Stage 2	Wind	102.4
Hornsdale 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
Lincoln Gap Wind Farm	Wind	126
Mt Millar	Wind	70
Snowtown	Wind	98.7
Snowtown S2	Wind	270
Starfish Hill	Wind	33
Tailem Bend	Solar	108
Waterloo	Wind	111
Wattle Point	Wind	90.75
Willogoleche Wind Farm	Wind	119
Total		2,276.15

Reference: AEMO: NEM Generation Information (for SA)

7.1.4. Transmission

The electricity transmission system transports power from power stations directly to a series of sub-stations 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 5,971 circuit kilometres of transmission lines. The network operates at nominal voltages of primarily 275 kilo-volts (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)
275 kV	2,733	26
132 kV	3,188	0
66 kV	21	3

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

ElectraNet operates 98 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 of 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 centre 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 the 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 km 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 900,000 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. The electricity distribution network in South Australia covers more than 178,000 km². The network extends across difficult and remote terrain and operates in demanding conditions and stretches for over 82,000 km, and includes 399 zone substations, 74,872 street transformers, more than 640,000 Stobie poles and 200,000 km of overhead conductors and underground cables. Some distribution substations are within sites shared with ElectraNet.

Table E4: Distribution network length at August 2022

Operating Voltage	Overhead (km)	Underground (km)
Low Voltage (<1,000 Volts)	18,505	14,509
11 kV (includes 7.6 kV)	17,882	4,298
19 kV (SWER)	29,108	65
33 kV	3,992	139
66 kV	1,454	54
132 kV ¹	11	0
Total	70,941	19,065

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 2021* 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.
- Bushfire risk boundaries which dictate clearance distances between overhead powerlines and trees or other vegetation.

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 2021*.

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* 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 Installation

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 on 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 of Compliance 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

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 E 1: Non-compliant electrical installation at a major event

Figure E1 shows 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 notice does not register a conviction against the alleged offender, and paying the expiation is not considered to be an admission of guilt. Expiation notices can be challenged in court by the alleged offender, who could then face 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-compliance.

The court will then decide the actual penalty up to the maximum stated in the *Electricity Act 1996* or *Electricity (General) Regulations 2012* 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, Gas Fitters 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 on 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 4).

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.

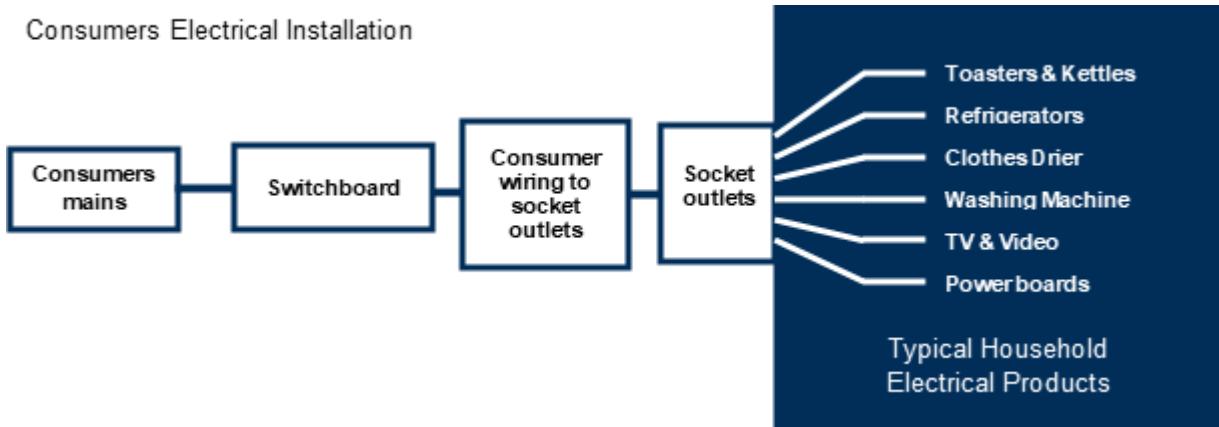


Figure E 2: Boundary of installations from products

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, expiation 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 has powers 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 64 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 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 4 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 E 3: Regulatory Compliance Mark



Figure E 4: Example of approval labelling for an OTR (S marking) approved product – wall switch



Figure E 5: Example of the RCM approval labelling symbol for an approved product – desk lamp



Figure E 6: Example of approval labelling for regulatory authority NSW Fair Trading – laptop charger

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 for sale and report them to the Technical Regulator, who is then 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 E 7: Example of an electrical product failure

Figure E7 illustrates the consequences of a faulty electrical connection in a washing machine that overheated and caught fire.



Figure E 8: Example of an electrical product failure

Figure E8 illustrates the consequences of a bathroom heater glass diffuser shattering whilst in use, resulting in the user receiving burns and cuts

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.

Figure E9 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 E 9: 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 marketplace. 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 Australian Government 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 Australian Government 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 Australian Competition and Consumer Commission (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 issued 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.

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 only a few 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).

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 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 for a national scheme to be 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 then Ministerial Council on Energy (MCE) 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 then MCE gave in-principle agreement to the recommendations contained in the plan as they apply to Energy Ministers' portfolio responsibilities. The then 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 on the development and implementation of the nationally harmonised safety framework. In 2012, the Australian Government, States and Territories endorsed the IGA on Energy Supply Industry Safety by the signature of First Ministers. Under the IGA, the Australian Government and the 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 Energy Senior Officials Meeting 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 Work 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 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-011</i>	<i>Electricity Metering Equipment</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 and Mining 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), Southwest Queensland via the QSN Link Pipeline (Ballera) and Victoria via Port Campbell to Adelaide pipeline (PCA pipeline). The Southeast 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 southeast South Australia. The MAP is operated by Epic Energy South Australia (EESA) and the PCA pipeline is operated by SEAGas. A joint venture project between EESA and SEAGas 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 Port Pirie and Wasleys laterals in the north, however, following this project both laterals can now be fed via the MAP pipeline from gas supplied via the PCA pipeline.



Figure G 1: 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 consumers. Should there be a gas supply emergency the Technical Regulator will act within the provisions of the legislation to ensure that the impact upon the South Australian community is minimised.

Gas is transported from the source through transmission pipelines and these in turn transfer 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.

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

11.3. Safety of Natural Gas Infrastructure

As required by the Gas Act 1997 and AGN's gas distribution licence, AGN must submit a Safety, Reliability, Maintenance and Technical Management Plan (SRMTMP) to the Technical Regulator for approval. This Plan is required to include a detailed Leakage Management Plan (LMP), an Asset Management Plan (AMP) and a Distribution Mains and Services Integrity Plan (DMSIP). The Technical Regulator approves the SRMTMP on an annual basis 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 the 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 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 KPI's 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 with pressure above 1,050 kilo-Pascals (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 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 G 2: 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 (DMSIP)

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 an issue related to measurement factors. In old networks, the majority of UAFG is often associated with leaking of cast iron and unprotected steel 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 'old generation' high density polyethylene (HDPE) mains replacement which is expected to reduce the risks of failures at the squeeze off areas and reduce levels of UAFG over time.



Figure G 3: HDPE mains replacement

11.4. Safety of LPG Distribution Networks

Distributors and retailers of reticulated LPG in South Australia are required to have the licencing 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 *Gas Regulations 2012* apply. Network owners operate their LPG distribution networks under a SRMTMP approved by the Technical Regulator. The Technical Regulator monitors technical compliance to ensure that the construction, commissioning, operations and maintenance of the LPG distribution networks are undertaken according to the appropriate Standards and gas industry practices.



Figure G 4: Gas storage tank compound

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

Table G1: LPG distribution networks in South Australia as of 30 June 2022

Network Location	Owner/Operator	Length of Main (m)	Operating Pressure (kPa)	Number of consumers
Roxby Downs	Origin	31,381	120	1,571
Victor Harbor (Rosetta Retirement Village)	Origin	5,474	80	410
Renmark (Jane Eliza Estate)	Origin	2,736	80	99
Port Lincoln	Origin	4,075	105	165
Wallaroo	Origin	6,355	70	201
Cape Jaffa Anchorage	Origin	3,600	70	28
Mount Barker (Glenlea Development)	AGN	3,700	100	101
Mount Barker (several locations)	Environmental Land Services (ELS)	52,344	70 – 120	3,672

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, covering issues 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 Installation

12.1. Natural Gas and LPG Installations

Gas installations are located downstream of the supplying infrastructure, which for natural gas is the gas meter and for the first stage regulator connected to LPG cylinders. 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 (and includes any Standard also called up by or under AS/NZ 5601). The Regulations require that an electronic 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.

A number of new residential, as well as industrial/commercial natural gas connections, are made every year to the AGN distribution system. New LPG connections (by various LPG 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 LPG by means of reticulated LPG 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 LPG 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 safety team in the OTR. Most advice of this type involves commercial or industrial premises. Accordingly, 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 as it is preferable to identify and resolve installation issues proactively in advance rather 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 (those that consume more than 10 megajoules of gas per hour) 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 G 5: New Air Dryer (type B appliance) undergoing commissioning and type B testing



Figure G 6: 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.

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. In South Australia, the Australian Gas Association (in alliance with Gassupport Pty Ltd) and TG Certifications are approved to undertake certification testing of type B appliances. The Technical Regulator in turn carries out sample audits of type B certification work performed by both certifiers.



**Government of
South Australia**

Office of the Technical Regulator Gas Field Audit v3- Stage 2

WLO / CG099391 / 1 Feb 2022 / Ron Meakins

Complete

Conducted on	1 Feb 2022 12:00 ACDT
Prepared by	Ron Meakins
Address	
Reference number	
For office use only	WLO

Inspection

WHS Requirements

Have you conducted a visual Risk Assessment?	Yes
Is it safe to proceed with the audit	Yes
Appliance Type	
What type of installation are you inspecting?	Type A
Are you inspecting Consumer piping?	No

Appliance Inspection

Installation and Inspection Details, click here to start inspection

Installation and Inspection Details, click here to start inspection 1

Is this a domestic or commercial installation	Domestic
What type of appliance(s) are you inspecting	Hot Water Heater
Manufacturer	Rinnai



Photo 1

Are the ventilation requirements adequate?

Non-Compliant



Photo 2



Photo 3



Photo 4

Figure G 7: Example of gas e-audit form

Mobile installations in recreational vehicles

The Technical Regulator pays close attention to the standard of LPG 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 Infrastructure and Planning (DIT) Vessel Unit in South Australia to provide day-to-day operations.

Commercial houseboats are required to be periodically surveyed by DIT 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.

Due to 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 LPG 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 PowerPoint 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. Figure G8 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 G 8: 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 LPG cylinders. Modifications have since been undertaken to the appliance installation to conform to the Standard.



Figure G 9: Example of non-compliant portable generators

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 LPG 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 lesser financial circumstances and gas installation and appliance maintenance may not be a priority.

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, 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 LPG regulator due to gas leaking and rectification of the high-pressure cylinder connection and prohibited jointing.



Figure G 10: Example of a communal cooking facility at a caravan park that required modification

Where a caravan is used as 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 that are manufactured or assembled by pyro technicians and / or gas fitters for use in public events such as the Fringe Festival, corporate events, or by 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 and 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 the risks 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, operating and decommissioning. All relevant regulatory authorities should be notified of the activity, i.e. MFS / CFS / SafeWork SA / Councils if permits are required.



Figure G 11: Examples of LPG 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 proactive 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 sent 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 then be carried out. An expiation notice may be issued for defective work. Expiation notices impose a fine plus a 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 history of significant non-compliances.

The process is generally as above with the exception that no expiation is levied and prosecution is instead proceeded with. The evidence, comprising of various interview/investigation notes, statements, photographs and measurements/observations/reports are gathered.

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 gas fitter 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 generally be a much more effective approach to remedy situations. The interview is carried out with two authorised officers in attendance and is recorded. 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.
- 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 more serious circumstances, licence cancellation.

If a person is found to be performing gas fitting work while unlicensed, CBS may, in serious 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 those involving natural gas or LPG, or their products of combustion.

Figure G12 bellow 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.

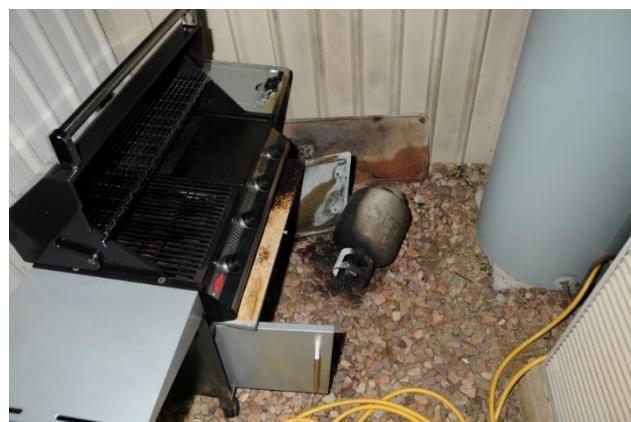


Figure G 12: Gas BBQ fire due to gas leaking from the high-pressure POL connection



Figure G 13: House fire because of an incorrect DIY appliance installation

Figure G13 shows the result of a fire involving pyrolysis, with 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 \$3,400 in 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 G 14: 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, 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 LPG Appliances

Every few years, 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 G15 and Figure G16. 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.

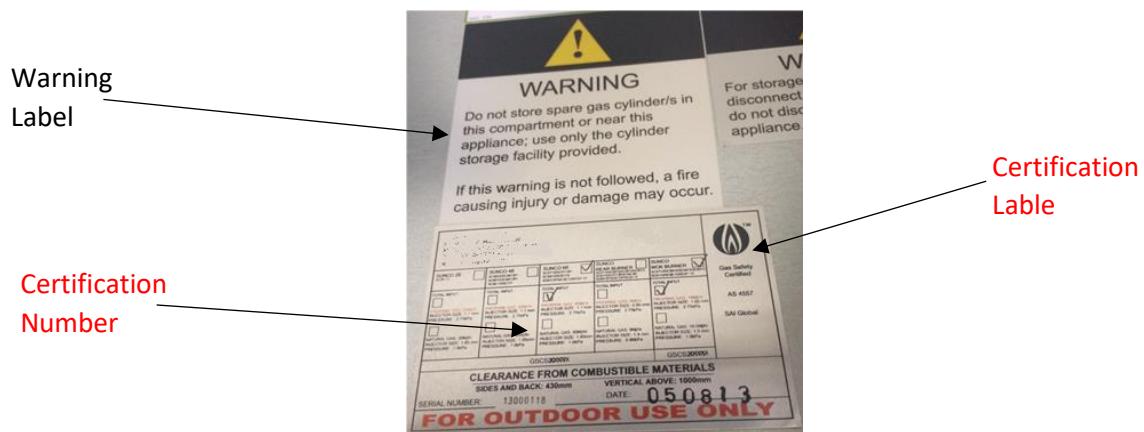


Figure G 15: Information Data Plate including certification number, warning, and certification label



Figure G 16: 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 several 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. Gas Technical Regulators Committee (GTRC)

All Australian jurisdictions as well as New Zealand are members of the Gas Technical Regulators Committee (GTRC). The GTRC holds two meetings a year.

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 several 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 does not 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 Regulator's safety awareness campaign. Information is contained on the "[Be Energy Safe](#)" [website](#). 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 use, inside of your home).

14.2.2. 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 LPG 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.

14.2.3. 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.

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.

14.2.4. 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).

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

The function of AG-038, the LPG 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.

14.2.6. 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.

14.2.7. 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 LPG, 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 LPG installations on houseboats.
- **Plumbing Industry Technical Forum:** The Technical Regulator provides advice on legislation and Standards relating to natural gas and LPG 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 Australian 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 LPG, 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 LPG are involved.

National Gas Emergency Response Advisory Committee (NGERAC)

Originally, the then Ministerial Council on Energy (MCE) developed a National Gas Emergency Response Protocol. Energy Ministers now provide national oversight and coordination of energy sector decision-making and energy market reform

In Australia, a large proportion of the national gas supply network is interconnected across most State and Territory borders and Energy Ministers seek to facilitate the development of a more reliable, secure, and competitive national gas market. Energy Ministers have 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, 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 71 licensees in South Australia and a total of 67 Water Industry Entities (four 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	30
Intermediate	Between 500 and 50,000	40
Major	More than 50,000	1
Total for South Australia		71

SA Water provides drinking water and sewerage services to approximately 1.7 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, Southern and Hills	19
Central, Northern Areas & Yorke Peninsula	19
Eyre Peninsula	12
South East	7
Riverland & Murraylands	10
Total for South Australia	67

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

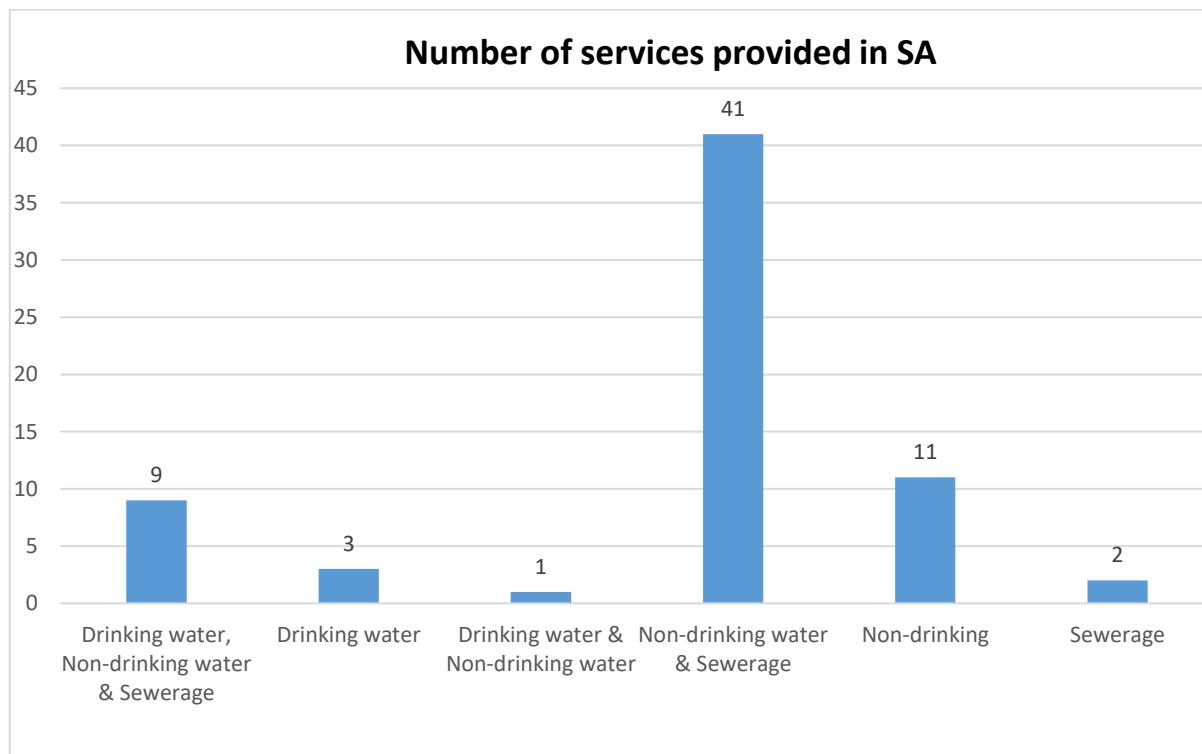


Figure W 1: Split between services provided by water industry entities in South Australia

Of the current 67 water industry entities in South Australia, most provide sewerage services (80% 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 Safety, Reliability, Maintenance and Technical Management Plan (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*. 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.

15.3.1. National Performance Reporting

The OTR is one of two South Australian jurisdictional coordinators for National Performance Reporting (NPR) since 1 July 2021. The NPR Framework supports commitments made by States and Territories under the National Water Initiative (NWI), to report publicly and independently on the performance of urban water utilities. The NPR is published annually by the Bureau of Meteorology (BoM). The OTR's role as jurisdictional coordinator is to be a point of contact for BoM for all data collection, submission, and auditing issues as well as any participation in Framework Reviews as directed by the Urban Water Reform Committee (UWRC).

A major review of the NPR Framework was undertaken in 2019 and as a result a set of recommendations were delivered to ensure the NPR's relevance and value into the future. In response to some of the recommendations an Indicator Review was undertaken in 2021 which sought to identify a set of nationally relevant and future focused themes, outcome areas and reporting metrics.

The Indicator Review was undertaken by Hydrology and Risk Consulting (HARC) in partnership with Aither and Risk Edge Consulting. The Review engaged with existing and potential users through consultation, workshops, and briefing papers. Local government, privately owned and State-owned corporation (SOC) service providers with less than 10,000 connected properties do not currently report under the Framework. The Review considered whether reporting should be extended to include those with less than 10,000 connected properties.

From October 2021 through to April 2022, the OTR ran a two-part voluntary trial in conjunction with HARC. Phase-one of the trials was about developing a shared understanding of the proposed reporting requirements and the ability of water industry entities to provide the information. Entities were provided the proposed less than 10,000 connections indicator set as well as the draft indicator handbook as an attachment to the trial. Phase-one provided entities with the opportunity to provide a considered response and self-assessment on each of the proposed indicators in terms of ability, as an organisation, to provide the data identified.

Phase-two focused on trialling a data collection for the proposed indicator set using the Queensland Water Directorate's Statewide Water Information Management (SWIM) web portal. Phase-two was based on the current NPR indicator set minus any indicators marked for retirement through the Review. The SWIM system is not yet set up for the less than 10,000s indicator set as it was only proposed at that stage and is still under review. Phase-two of the trial was only focused on trialling the reporting aspect through SWIM.

The draft findings and recommendations of the NPR Indicator Review indicated broad support across Australia for the inclusion of entities with less than 10,000 connections to provide performance reporting data to the NPR. The NPR Review has had no further updates since late in 2021. The Review's final recommendations are still underway, and the BoM will be working through an implementation roadmap. Through its role as joint jurisdictional coordinator the OTR will communicate any new updates to the Review as they occur.

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 Wellbeing (DHW) / 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 DHW and EPA Water/Wastewater Incident Notification and Communication Protocol as a notifiable agency. This Protocol is specific to SA Water, EPA and DHW 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 Installation

16.1. Plumbing Regulation

The *Water Industry Act 2012* and the *Water Industry Regulations 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).

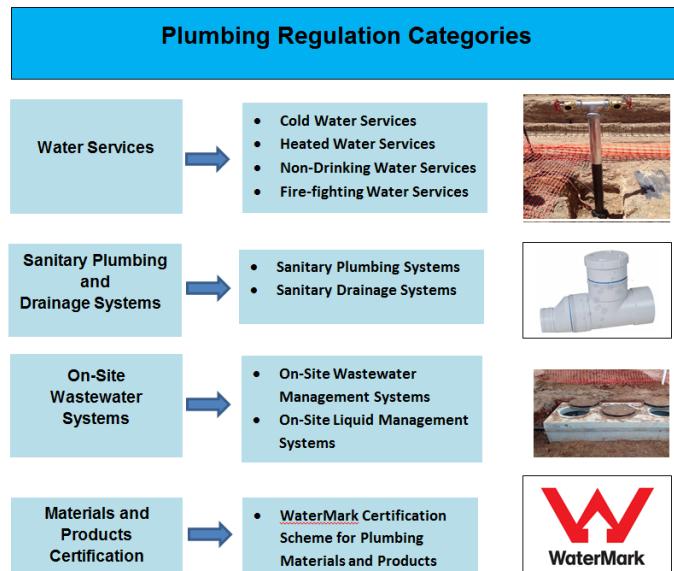


Figure W 2: Plumbing categories that are monitored and regulated through on-site audits by the OTR

16.2. Plumbing Compliance

The Technical Regulator is responsible for monitoring and regulating technical Standards with respect to on-site plumbing. Plumbers constructing, installing, replacing, repairing, altering and maintaining pipes or any other equipment, products or materials used in connection with plumbing are required to book these installations for audit with the Office of the Technical Regulator.

The Technical Regulator undertakes routine sample audits of plumbing installations, non-compliant plumbing installations are rectified to ensure technical compliance with the Plumbing Standard issued by the Technical Regulator under section 66 of the *Water Industry Act 2012*.

Testable backflow prevention devices on the customer's side of any water connection point must be commissioned and tested after installation in compliance with AS 2845.3.

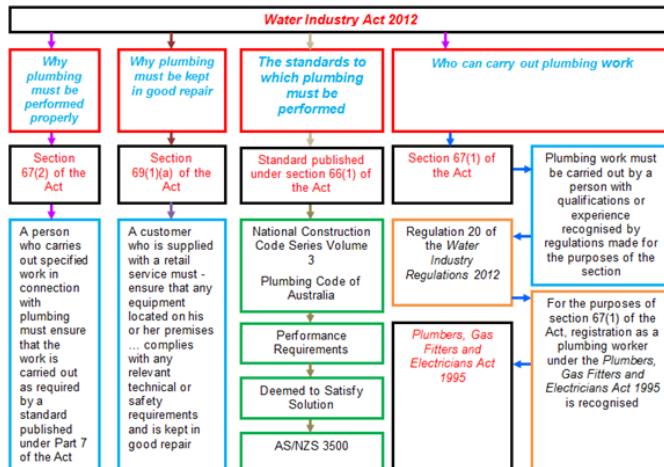


Figure W 3: Details of plumbing obligations under the Water Industry Act 2012

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 Plumbing Code of Australia (PCA). All plumbing installations must meet the performance requirements of the PCA through the deemed-to-satisfy solutions set out in the AS/NZS 3500 plumbing and drainage Standard Suite or by satisfying the performance requirements set out in the PCA.

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 of complete plumbing installations 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 cases 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.

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.

- Sewer Investigations.
- Site Meetings/Inspections.
- Trade Waste Plumbing.
- Underfloor Plumbing.
- Water Inspections/Investigations.
- FPAA101D Sprinkler Systems.
- Non-Drinking Water – Investigations.
- Sewer Investigations.
- Site Meetings/Inspections.
- Trade Waste Plumbing.
- Underfloor Plumbing.

16.3.2. Policy for Acting on Non-Compliance

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

- Assessing the technical compliance 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 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.
- Enforcement Notice 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 regularly refers to the Consumer and Business Services (CBS) web-site to monitor plumbers' registration and contractor licence details to ensure plumbers are appropriately licensed as per the requirements of the *Water Industry Act 2012*. 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 has introduced a reinspection fee to be charged to plumbing contractors who must rectify non-compliant plumbing work and re-submit the installations for further auditing.

The reinspection fee is commensurate with the reasonable costs associated with on-site reinspections. 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. Expiation Notices

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

While the decision to issue an expiation notice 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 referred to 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.
- FPAA101D sprinkler systems.
- Inground fire hydrant systems.

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 (Plumbing Code of Australia), ensures durability, ongoing quality and economic value for commercial developments within the Adelaide CBD and across South Australia. Design plans can additionally identify the use of compliant products and materials on the customer's side of an installation.



Figure W 4: Examples of Plumbing and Drainage Installations in 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, related to residential and commercial developments.



Figure W 5: Commercial Drainage Installation



Figure W 6: New Royal Adelaide Hospital under construction

16.3.8. Regional Areas

The Technical Regulator has maintained a 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 areas such as the Riverland, 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 Wellbeing 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.



Figure W 7: Technical Regulator audit of inground fire system

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. Figure W8 shows most of the metropolitan areas supplied with non-drinking water in South Australia.



Figure W 8: 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 W8.



Figure W 9: 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.

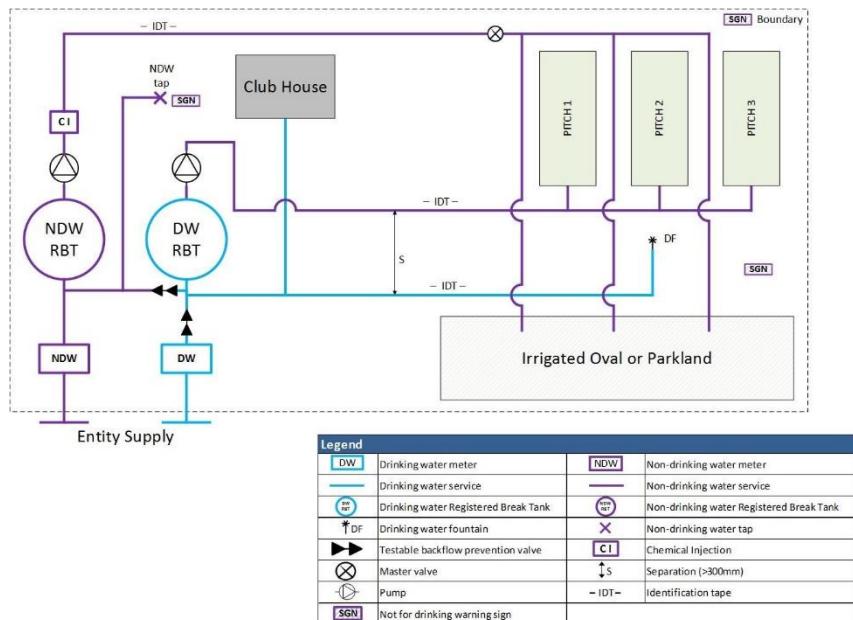


Figure W 10: Typical irrigation installation with Registered Break Tanks installed on both water systems

Figure W11 demonstrates a typical drinking water/non-drinking water installation on a community title development with appropriate signage and physical separation of services.

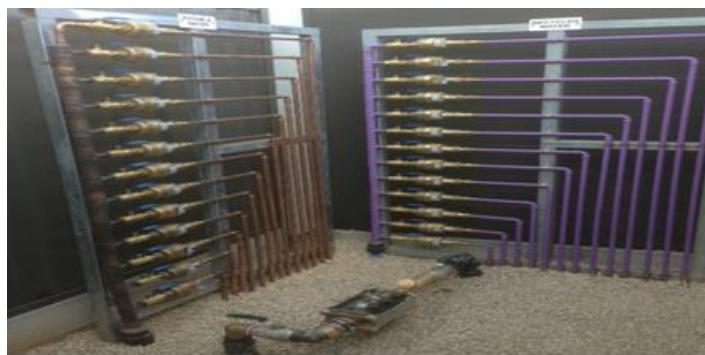


Figure W 11: Drinking and non-drinking water meters



Figure W 12: 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 in-ground 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 1,700 KPa 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 W 13: 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 W 14: 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 Entity's 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 Technical Regulator monitors drinking water and non-drinking water service installations for compliance with the performance requirements of the National Construction Code Volume Three. The Technical Regulator's Cross-Connection and 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, unclean, 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.

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 technical sample monitoring 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 communication sessions with industry (see Section 16). Ongoing communication has focused on engaging directly with industry stakeholders to ensure compliance measures are adhered to.



Figure W 15: Reduced Pressure Zone Backflow Devices in in-wall stainless steel tundish box

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. Enforcement and Encumbrance Notices

The Technical Regulator places a notice 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. Encumbrances held by the Technical Regulator relate to backflow prevention devices. The remaining enforcement notices relate to non-compliant plumbing and drains crossing boundaries. These notices are registered on the South Australian Integrated Land Information System (SAILIS). A notice 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.

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. The Technical Regulator will continue to work with State and Local Government to explore more opportunities for the self-management of testable backflow prevention devices.

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		ValvOHeQ	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	RP2	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 W 16: 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 and general plumbing and equipment installation requirements.

Office of the Technical Regulator

Backflow - External hose taps

Plumbing Advisory Note – issued February 2022

Legislative requirements

BSS.1.4 Individual protection

(a) The following are Low Hazard for the purpose of individual protection

(vi) External hose taps, with no hazards within 18m

A Vacuum breaker will be the simplest way to retrofit a low hazard backflow device to a hose tap.

Background

Outside garden taps are used for all types of applications within a property. The drinking water supply must be protected from possible backsiphonage events. Backsiphonage events can occur when there are variations in water pressure, an example is a burst main on the street or water pump failures on multi storey buildings. The PCA has deemed garden taps with no identified hazards to be a low-risk hazard.

Note: Recycled water hose taps do not require additional backflow protection.




Office of the Technical Regulator

Chemical dispensers

Plumbing Advisory Note – February 2021

The Plumbing Code of Australia (PCA) has determined the cross-connection hazard rating for chemical dispensers as 'medium and high hazard'.

This will be dependent on the toxicity of the chemicals. Refer to the chemical's Material Safety Data Sheet (MSDS) for toxicity.

Chemical dispensers, depending on the manufacturer, may have an integral backflow such as a registered air gap. This would negate the need for additional individual backflow protection upstream of the chemical dispenser. Air gaps (including air gaps integral to dispenser units) will need to be registered with the OTR with a nameplate attached. All backflow prevention devices must be tested annually to AS/NZ 2845.3:2020.

If there is no compliant backflow prevention device integral to the chemical dispenser, 'individual' backflow protection must be installed upstream of the chemical dispenser before connecting the dispenser to the property's drinking water supply.



Figure 1 — A chemical dispenser with integral air gap

Legislative requirements

The National Construction Code (NCC) Volume Three, Plumbing Code of Australia (PCA)— part B sets out the requirements related to water services.

Part B5.1 sets out the requirements relating to cross-connection hazards and corresponding hazard ratings.

Error! Reference source not found.Examples of Plumbing Advisory Notes

17.2. Training Sessions for Water and Plumbing Industries

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

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.
- Safety and technical requirements 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, WaterMark compliance and Water Efficiency Labelling Compliance (WELS).



Figure W 17: Training session conducted by the OTR plumbing section at Tonsley TAFE.

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.
- Hydraulic Consultants Association (HCAA).
- Master Plumbers Association of SA Inc.
- Peer Training Reference Group.
- SA Water.
- Backflow Prevention Association of Australia.
- Water Industry Technical Advisory Committee.
- Country Fire Service (CFS).
- Building Consultants Forum.
- Water Industry Alliance (WIA).
- Department for Health and Wellbeing.
- Backflow Prevention Association of Aust.
- PlanSA.
- The Commission.
- Australian Building Codes Board.
- Local Government Association of SA.
- Regional Local Government Groups.
- Fire Industry Association (FIA).
- Australian Water Association (AWA).
- Metropolitan Fire Service (MFS).
- Wastewater Special Industry Group (Environmental Health Officers).

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 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.

Hydraulic Consultants Association Australasia (HCAA) (South Australia)

The Technical Regulator actively engages with members of the HCAA 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 wastewater 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 (PIRG)

PIRG is an Industry Reference Group. PIRG members represent various sectors of the plumbing industry including the Technical Regulator, MPA, Plumbing Contractors, the Construction Industry Training Board, manufacturers 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. | Reporting on the training package. |
| Licensing matters. | Quality and Industry Validation. |
| Training and information sessions conducted to staff and students by the Technical Regulator. | Training Gaps. |
| Continual professional development. | WHS. |
| | Business Development. |

Building industry technical advisory committees

The Technical Regulator is involved with the Master Builders Association (MBA) and the Housing Industry Association (HIA) technical committees. The Technical Regulator provides information and advice to the MBA and HIA on 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 Authority (EPA).

Section 18: Water and Plumbing Regulatory Coordination

18.1. Technical Standards

The Technical Regulator 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 section 66 of the *Water Industry Act 2012*.

18.1.1. Water and Sewerage Infrastructure Technical Standards

The Technical Regulator has published an Infrastructure Standard which adopts the Water Services Association of Australia (WSAA) codes as the principle minimum Standard for 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.

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 9).

National Construction Code (NCC)

The NCC is an initiative of the then 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 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 W18).

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 2022.

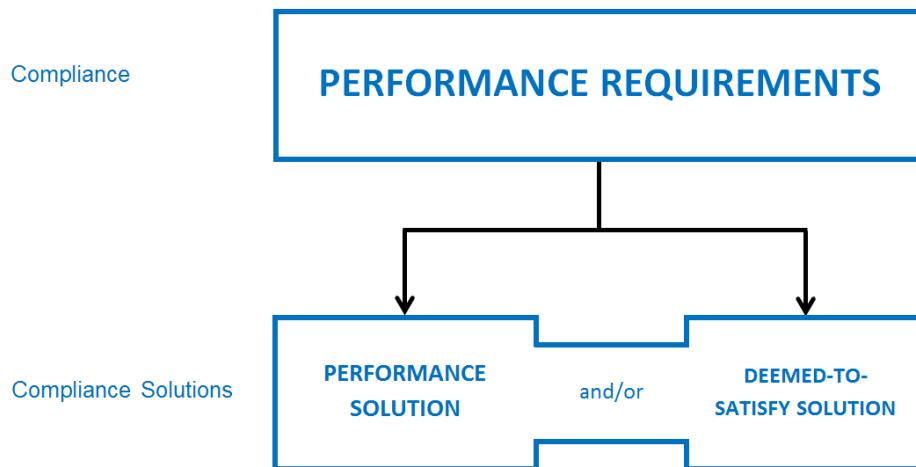


Figure W 18: NCC Compliance Structure

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 database 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 28 th May 2021) |
| Part 2 Sanitary plumbing and drainage. | (version published 28 th May 2021) |
| Part 4 Heated water services. | (version published 28 th May 2021) |
| Part 5 Housing installations. | (Part 5 has been discontinued) |

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.

18.1.3. OTR Guidelines

Non-Drinking Water Guidelines

The Technical Regulator released non-drinking water guidelines titled 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

Appendix 1: OTR Activity Report – 2021-22

This is an activity report that describes the operations of the Technical Regulator in the Electrical, Gas, Plumbing and Water industries over the 2021-2022 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.

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Overall Activities for 2021-22

Section A1: 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 at 1,200-1,500 per month in June and July 2018.

eCoC submission rates have since increased year-on-year, exceeding the annual volume of paper certificates which were printed prior to the introduction of the eCoC system. When considering wastage associated with correcting paper certificates, this trend indicates increasing levels of compliance within industry. The vast majority of eCoCs relate to electrical work, as can be seen in the comparative axes in the figure below. The Technical Regulator now receives up to 30,000 electrical eCoCs each month. Plumbing and gas work generates fewer certificates, up to 2,500 and 3,000 each month, respectively.

Figure 1 indicates that rates of eCoC submission have continued to increase, even during the Covid-19 period, which is indicative of increasing levels of compliance and minimal impact due to the pandemic.

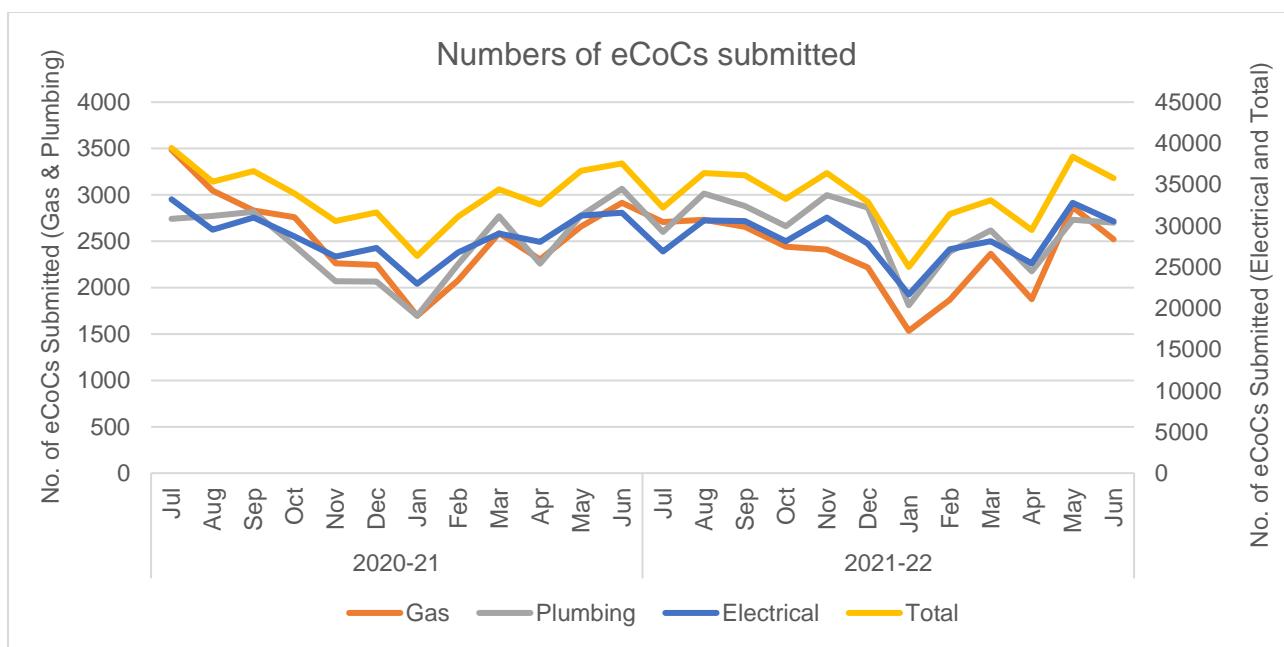


Figure A1.1: Electronic Certificate of Compliance Submission Rates by Industry

Note that gas and plumbing eCoC submissions are plotted on the left-hand side vertical axis while electrical and total eCoC submissions are plotted on the right-hand side vertical axis. This reflects the approximate 10 times rate of electrical eCoC submissions vs other installation types.

The eCoC platform 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.

Automatic Mutual Recognition (AMR) of Interstate Licenses

AMR is an Australian Government led program intended to enable workers who need to be licensed or registered to take up new work opportunities across most of Australia. AMR allows workers to use their home State's current licensing in other jurisdictions without having to apply or pay for a new

license in that State or territory. AMR commenced in South Australia on 1 February 2022 through Consumer and Business Services' (CBS) register. Interstate plumbers, electricians and gas fitters using the AMR scheme intending to work in South Australia can contact the OTR after registration with CBS in order to have a user profile created in the eCoC system, allowing AMR participants to fulfill their worker and contractor obligation in South Australia and create and submit eCoC documentation for any work undertaken. To date, 19 accounts have been registered for eCoC systems under AMR arrangements.

Table A1 1: Electronic Certificates of Compliance statistics as of 30 June 2021

		Electrical	Gas	Plumbing	Total
Submitted eCoCs	2018-19	293,244	28,591	20,251	342,086
	2019-20	318,442	31,021	26,672	376,135
	2020- 2021	401,659	36,180	35,227	473,066
	2021- 2022	340,837	28,201	31,445	400,483
	Total eCoCs*	1,333,581	128,139	114,024	1,575,744
New Licences Registered	2018-19	4,609	1,380	1,425	5,195
	2019-20	1,728	425	434	2,587
	2020-21	1,285	324	341	1,950
	2021-22	1,457	428	463	2,348
	Total Licences*	15,334	4,615	4,800	17,537 (Unique Licensees)

*Total eCoC and License numbers are since eCoC records began in January 2017 and August 2016 respectively:

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

The 2021-22 summer was relatively average from a temperature perspective, however there were episodes of intense rainfall particularly in the north of the State and over parts of the Eyre Peninsula. The rainfall resulted in an event which necessitated personnel from the Office of the Technical Regulator being involved as departmental Support Agency staff during activation of the State Emergency Centre.

No declaration of an Electricity Supply Emergency was made pursuant to the *Emergency Management Act 2004* in 2021-22, nor were there any emergency declarations made under the *Gas Act 1997* or the *Petroleum Products Regulation Act 1995*.

Events in 2021-22 consisted of:

- The ongoing Covid-19 response; and
- The South Australian outback flood emergency January – February 2022.

The Covid-19 response has involved personnel from the Office of the Technical Regulator participating at the State Emergency Centre from time to time, where it was activated. Personnel from the Office of the Technical Regulator have also responded to contact from energy industry participants and assisted with their understanding of requirements at times when border restrictions have periodically been implemented. The Major Emergency declaration in relation to Covid-19 was lifted on 24 May 2022, with powers to manage Covid-19 now residing in the *Public Health Act 2011*.

In relation to the South Australian outback flood emergency, an extreme rainfall event occurred in late January 2022 as a result of a broad low-pressure trough directing tropical moisture from an active monsoon trough down into South Australia. Some notable locations were Kimba on the Eyre Peninsula with approximately 210mm of rain (160mm fell on one day alone), Whyalla with 170mm, Kadina with 115mm, Leigh Creek with 110mm, and Woomera with 100mm of rain from the system. The far north of the State received significant rainfall in this event and then received further extreme rainfall from another trough in early February. Some notable rainfalls were at Ernabella / Pukatja in the APY Lands which received 115mm, and Oodnadatta which received 65mm with the second trough.

The most significant impact from the extreme rainfall event was the blocking of the Stuart Highway at Glendambo for several days as floodwaters rested across the roadway. The rainfall also washed away sections of the Indian-Pacific railway and several gravel roads in the affected rural areas. A Major Emergency was declared by the State Coordinator on 28 January 2022. The response involved personnel from the Office of the Technical Regulator participating at the State Emergency Centre and coordinating with the liquid fuel industry in relation to refuelling of remote communities for both vehicles and for diesel power generation (the Remote Area Energy Supplies operated by the Department for Energy and Mining). The Major Emergency declaration was lifted on 8 February 2022.

More broadly, the Office of the Technical Regulator maintains well-developed relationships with the Australian Energy Market Operator (AEMO), State and Territory Governments and the Australian Government, as well as other bodies such as the Bureau of Meteorology to help facilitate information flows and maintain situation awareness in relation to power and gas system issues.

The Office of the Technical Regulator monitors 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 Office of the Technical Regulator closely monitored developments in the eastern States in June 2022, where challenging conditions with respect to weather, international developments such as the war in the Ukraine, and generator availability impacted on energy markets (particularly in New South Wales and Queensland), and the effect this had on supply and wholesale prices across the National Electricity Market.

The Office of 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.

Personnel from the Office of the Technical Regulator have participated in multiple emergency management exercises over the last twelve months, including the annual exercises with respect to electricity and gas coordinated by AEMO. Energy exercises have encompassed issues and matters concerning the electricity, natural gas, and liquid fuels industries.

1.3. Consumer Safety Survey

For 2021-22, the key outcomes and reporting from the Consumer Survey included:

- Across the sample, 26% recall seeing at least one form of OTR advertising, down compared to 2021 and 2020 measures (42% and 30%, respectively).
- The top three messages that survey participants recalled seeing or hearing were: “use licensed trade” (14%); “service your appliances” (13%), and “avoid scalding from hot water” (13%). The other two messages, “check BBQ gas connection before every use” and “beware of toxic carbon monoxide in your home”, obtained the lowest recall (10%).
- It was observed that the public was more likely to seek advice about gas, water and electrical safety from a qualified tradesperson (71%). In comparison, 16% would consult with the OTR, which has slightly increased from 2021 (13%).
- Tradespeople are the most sought provider of information across all age groups, whilst the Office of the Technical Regulator is thought of most by those aged 25 to 30 and 51 to 60.
- 18% of those who live in the metro area sought information from the Office of the Technical Regulator compared with those living in regional areas (9%).
- Online/internet (47%) and Facebook (41%) remained the most significant sources of advertising platforms over the last three years, whereas advertising on the rear of a public transport bus (22%) is the least significant advertising platform.
- 74% of the survey respondents indicated they were aware of the dangers of Carbon Monoxide (CO), similar to previous years. However, only 23% service their gas appliances at least every two years.
- The proportion of respondents who never service their gas appliances are higher for those who are not aware of the risks of CO poisoning (45%). However, over a third (34%) of those who are aware also never service their gas appliances.
- Amongst those who had work done on their property in the last 12 months: 83% were aware that the law requires a plumber to hold an appropriate license. 87% were aware that the law requires an electrician to have an appropriate license, and 84% were aware that the law requires a gas fitter to hold an appropriate license. These results were similar to the percentage obtained in previous years.
- Knowledge of safety behaviours, such as regularly checking gas and electrical appliances, has decreased. A large portion of the sample, 35%, never test their electrical safety switch or service their gas appliances; however, testing of electrical safety switches remains the most frequent behaviour.
- Knowledge of safety management, awareness of CO poisoning and where to report gas leaks generally observed similar measures to previous years.
- Provision of Certificates of Compliance for electrical and plumbing work has continuously increased since 2020. Provision of gas Certificates of Compliance has been decreasing, despite the rise of engaging tradespeople to undertake gas repairs since 2020.
- Awareness of the law requiring electricians, plumbers and gas fitters to provide customers with a Certificate of Compliance upon completion has remained consistent since 2020.
- Awareness of law that requires plumbers to provide a diagram showing any new sanitary drain location is similar to the percentage obtained last year. However, those supplied with constructed plumbing drawings have continually increased in the previous three years.
- Awareness of product certification schemes has remained constant. Provision of the safety certification or plumbing watermark certification for in-store purchasing has slightly decreased (43%) from 2021 (48%).
- A significant proportion of respondents were not provided with a safety certification (27%) for their online purchase compared to the 2021 sample (10%).
- 66% responded they purchased electrical, gas or plumbing products in physical stores, whereas 34% are buying products online; this number is similar to previous years, showing that most appliances are still being bought in physical stores.

It is worth noting that new safety campaign designs were used in 2021-22. The results were consistent with the last few years, indicating that demographic factors may influence safety attitudes and behaviours. The Technical Regulator will consider this feedback in designing the next safety campaign and redesigning the messages.



Figure A1 2: Survey participants recalled seeing or hearing Consumer campaign for 2022

Volume I – Electrical Industry

Section A2: Electrical Infrastructure

2.1. Audits by the Technical Regulator

2.1.1. SRMTMP Field Audits

In 2021-22, the operations of the Office of the Technical Regulator were impacted by the global Covid-19 pandemic leading to a reduced number of field audits of electrical infrastructure.

In addition to audits of compliance against an entity's SRMTMP, during the bushfire season OTR staff assist in the State's emergency management response as Control Agency for energy (or as a Support Agency where there is another Control Agency), and subsequently investigates bushfires where electrical infrastructure may have been involved in starting a major fire, including site visits, data analysis and compliance auditing.

The findings of these investigations are published on the department's website.

In 2021-22 SA Water Corporation, University of South Australia, District Council of Coober Pedy and EDL Coober Pedy Power Station were audited against compliance with their SRMTMP.

The areas audited variously included:

- Training systems.
- Safe Work Systems.
- Contractor management.
- Isolation practices.
- High voltage switching.
- As built drawing management.
- Commissioning and test plans.
- Accident investigation and reporting.
- 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. In each case, the OTR provided advice and recommendations to the entity on opportunities for improvement to their processes.

2.1.2. SA Water Corporation

The SA Water Corporation operates generation assets including photovoltaics (PV), battery energy storage systems (BESS) and synchronous generation. The current and on-going Zero Cost Energy Project (solar PV and BESS) consists of a number of new renewable projects, of which the Hope Valley and Bolivar sites are a part.

2.1.3. District Council of Coober Pedy

The District Council of Coober Pedy (DCCP) owns and operates the Coober Pedy electricity distribution network. The network comprises approximately 115 km of overhead lines, 13 km of underground cables and 193 distribution transformers.

2.1.4. EDL Coober Pedy power station

Coober Pedy power station is owned and operated by Energy Developments Pty Ltd (EDL), and comprises eight 0.5 MW reciprocating diesel engines, two 2.05 MW wind generators, 1 MW of solar generation and 600 kWh of battery energy storage.

2.1.5. University of South Australia Mawson Lakes solar

University of South Australia has carpark shelter, ground mounted and rooftop solar at its Mawson Lakes Campus. There are 5,484 monocrystalline solar modules with an export capacity of 1,645.40 kW.



Figure A1 E1: OTR Officers inspect UniSA Mawson Lakes solar equipment with site representatives

2.2. Generation

The *Planning, Development and Infrastructure (General) Regulations 2017* require 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 continues to receive numerous generator applications throughout the year. The proposed projects cover a wide range of technologies and complexities. In 2021-22, the Technical Regulator issued 17 certificates to proposed generators.

2.3. Transmission

2.3.1. Transmission Line Availability

The electricity transmission system transports power from the power stations directly to a series of sub-stations 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 over 5,929 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 98 substations and switchyards. Transmission line availability in 2021-22 was 99.34%. ElectraNet's Key Performance Indicators (KPIs) from its SRMTMP are listed in Table K1 in Volume IV.

2.4. Distribution

The distribution network delivers power to consumers. The major distribution network operator, SA Power Networks (SAPN), formerly known as ETSA Utilities, owns and maintains over 90,006 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 399 substations and switchyards.

The South Australian distribution network serves over 898,758 customers.

In 2021-22, fire starts attributed to distribution infrastructure showed a small decrease to 0.4 fire starts per 1,000 km of mains. SA Power Networks' KPIs are provided in Table K2 in Volume IV.

2.4.1. Reliability

The reliability indicator “normalised Unplanned System Average Interruption Duration Index” (USAIDI_n) for the SA Power Networks’ distribution system in 2021-22 was an average of 136 minutes per customer. This has increased from 127 minutes per customer reported in the previous year but achieves the service standard implied target of 150 minutes.

The Bureau of Meteorology (BOM) advised of numerous severe weather events in 2021-22 of which many were categorised as Significant Weather Events (SWE). There were five 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. These five events contributed 47.1 minutes to USAIDI and are removed from the calculation of normalised USAIDI.

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

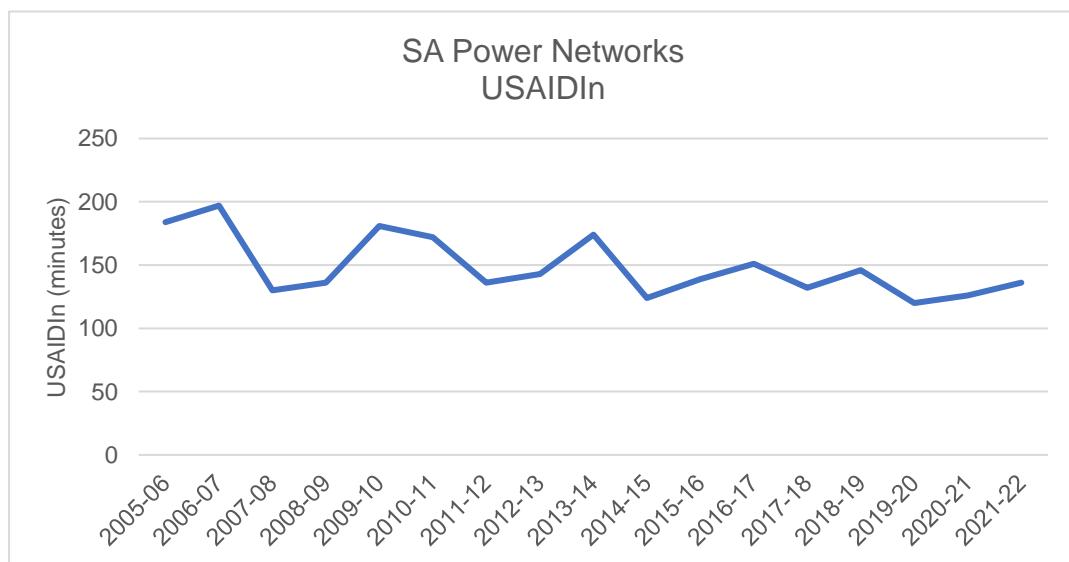


Figure A1 E2: State-wide Unplanned SAIDI for SA (minutes per customer)

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 (The Institute of Electrical and Electronics Engineers) Standard 1366.

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.

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

2.4.2. Outage Causes

The two major causes of unplanned interruptions across the State during the 2021-22 regulatory period continued to be weather and equipment failure. Using the performance measure of USAIDI_n, these two causes accounted for 60 minutes and 47 minutes respectively of the interruptions in 2021-22. Other causes included 5.4 minutes due to animals, mainly juvenile grey-headed flying foxes from the colony near the Adelaide Botanic Gardens.

The outage causes were generally relatively consistent with the previous years, as causes fall within the normally expected range. The Technical Regulator will also continue to monitor equipment failure reports.

2.5. Safety Clearances to Powerlines

2.5.1. Vegetation Clearance

Vegetation clearance regulation Review

The *Electricity (Principles of Vegetation Clearance) Regulations* were remade on 1 September 2021. Major changes implemented in the 2021 regulations included removal of both the bushfire risk area maps and the lists of trees approved for planting near powerlines. The maps are published on the Location SA Map Viewer and data.sa.gov.au, and the trees lists on sa.gov.au. Additions to the trees list were made in March 2022. The regulations now provide for the removal of saplings i.e. trees less than 5 years old, before they grow into the clearance zone. Also, clearance zones calculated for a particular powerline span using for example, sag and swing characteristics, are now offered as an alternative to requiring a prescribed worst-case clearance distance for each voltage to be used.

Risks associated with Vegetation near Powerlines

Falling vegetation continues to be a major factor in electricity outages. Damaged powerlines are a risk that can lead to sparking, and fires along with a risk of electric shock. In recent times, damage to electricity infrastructure due to falling trees and other vegetation – at times from outside the prescribed clearance zone – has led to major bushfires.

These incidents highlight the risks associated with vegetation near powerlines and the continued need for an effective vegetation management scheme.

Vegetation Clearance Objections

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

Exemption to Planting Restrictions

The Technical Regulator publishes lists of species of vegetation that may be planted under or in proximity to powerlines, under the *Electricity (Principles of Vegetation Clearance) Regulations 2021*. 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.

2.5.2. 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. Ten approvals were granted in 2021-22.

Equipment contacting overhead powerlines

18 incidents involving contact of equipment with powerlines were reported to the Technical Regulator in 2021-22. In each case, the OTR reviews reports to ensure that the cause of the contact has been correctly identified, and measures put in place to mitigate the risk of future incidents.

Section A3: Electrical Installations

3.1. Audits

In 2021-22, the Technical Regulator audited 1,973 electrical installations for compliance with the *Electricity Act 1996* and associated regulations. The number of audits conducted in the last 12 months have been impeded, in comparison to historical audits, due to Covid-19 outbreak and Government access restrictions. These restrictions have also affected intrastate auditing while delivering safety presentations. The majority of the audited installations are randomly selected from eCoC system, lists of new connections supplied by the distribution network service provider, SA Power Networks and other network operators. Additional installations audits were conducted due to complaints or a history of non-compliance.

The Technical Regulator assisted South Australian Police (SAPOL) at a total of 144 occasions. This includes attending 137 illegal cannabis growers' premises where dangerous wiring, including meter bypasses, were suspected. Numbers were low due to other commitments by SAPOL. Power was disconnected for installations deemed immediately dangerous until they were rectified by a licensed electrician.

The Renewable Energy team conducted 851 audits, 399 solar installations audited and 81 battery audits. A new sector of auditing was added to the renewable energy section, managing the inverter export settings. A total of 371 audits were completed which highlighted an incidence of over 80% of non-compliance.

3.2. Enforcement

In 2021-22, the Technical Regulator issued 32 expiations notices, slightly higher than last year. However, the number was impacted significantly, in comparison to historical enforcement, due to the Covid-19 outbreak and Government access restrictions to audit electrical work.

25 expiation notices were issued against owner/occupiers of premises for failing to maintain their electrical installation to an acceptable safe level. Seven expiation notices were issued to contractors / workers due to non-compliance or repeat of non-compliance.

One contractor was referred to Consumer and Business Services (CBS) for licensing disciplinary action.

3.3. Safety Awareness and Education

The Technical Regulator received 21,182 phone enquiries for interpretations or technical advice in relation to various electrical installation standards, from industry stakeholders, government departments and members of the public. Most of these calls were of a highly technical nature due to new industry innovation.

Attended industry events to discuss safety and compliance issues with electrical contractors. A total of 101 presentations were delivered, covering legislation and AS/NZS 3000 Wiring Rules and related standards, the updates to the electronic Certificates of Compliance, changes to solar photovoltaic (PV) installation standards, and reports on major and minor incidents. Safety and technical presentations were also delivered to apprentices, industry groups and government departments.

Regulation Roundup editions 48 and 49 were published and distributed to electrical workers, contractors and accessible on the [OTR website](#). The two editions covered technical information relating to specific sections of the Wiring Rules and other electrical standards, information on solar PV, battery installations and safe working practices. The feedback received from the industry demonstrates that Regulation Roundup has become a valued source of vital information to the electrical industry.

The Technical Regulator has retained a prominent profile in the electrical industry with a continued demand for a presence at industry functions. At these events, the OTR is available to provide valuable information to electrical workers and contractors. The OTR discuss electrical safety and compliance issues in detail.

The awareness promoted to the electrical installations industry in South Australia, at the annual National Electrical and Communications Association (NECA) Roadshows, includes changes to various Australian standards and an update on activity within the industry.

The Technical Regulator has conducted additional presentations to SA POL and the MFS. The presentation was on electrical hazards encountered on sites and increasing the awareness of solar and battery installations which are becoming more complex as industry innovation continues to develop.

The Technical Regulator's safety presentations to the industry continue to have a vital role in maintaining a good safety record within the industry and improving relations with electricians. The Technical Regulator also provides safety and technical presentations to apprentices, industry groups and other government departments on a regular basis.

The Technical Regulator was present at the Master Builders Association, the Sunday Mail home building expos, Trade tool expos and the Caravan and Camping Shows throughout the year. Such events create an ideal opportunity to further promote electrical safety, and answer queries from the public in a relaxed and friendly environment while also increasing public relations.

Unfortunately, some of the events and roadshows held this year have been cancelled due to the Covid-19 outbreak and government restrictions.

3.4. Incidents

In 2021-22, there was a total of zero electrical fatalities. There were two major electrical incidents; one involving a cannabis grower not electrical related, and the second, an unlicensed worker attempting to pull in cables from a cable pit located inside in a non-energised switchboard.

There were 179 minor electrical incidents; 14 being solar fires, one hydroponic fire, 40 minor incidents (including arcing incidents), 115 electrical related fires, three battery fires related to a solar-installation and six battery fires not related to a solar installation.

The Technical Regulator received a total of 1,142 electric shock reports over the last 12 month period. These shock reports include incidents with electrical installations, owner/occupier error and the electrical infrastructure which accounted for over 55% of events reported.

Table A1 E1: Numbers and Percentage of Shock Report by Recipient Category

Recipient Category	Number	%
Electrical Workers	58	5%
Employees	195	17%
General Public	839	73%
Other Trades	50	4%
Total	1,142	100%

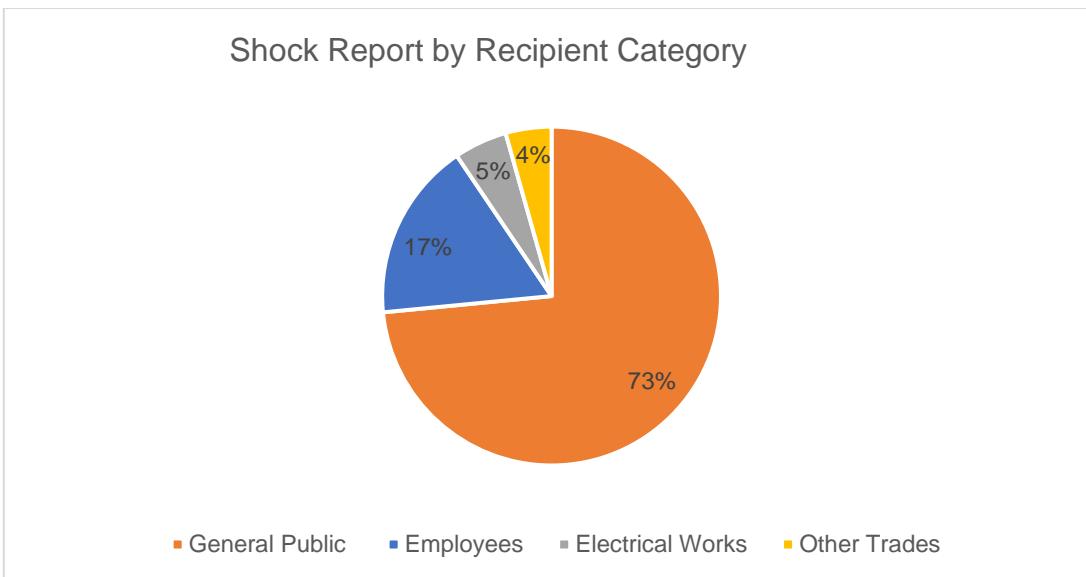


Figure A1 E3: Shock Report for 2021-22 Financial year by Recipient Category

Table A1 E2: Numbers and Percentage of Shock Report by Translated Cause Category

Translated Cause Category	Number	%
SAPN MEN	633	55%
Direct contact with live parts	163	14%
Defective insulation	142	12%
Electrostatic phenomena	58	5%
Electrical faults	18	2%
Inadequate circuit design	10	1%
Lack of earthing	15	1%
Loss of earthing	13	1%
Other	90	8%
Total	1,142	100%

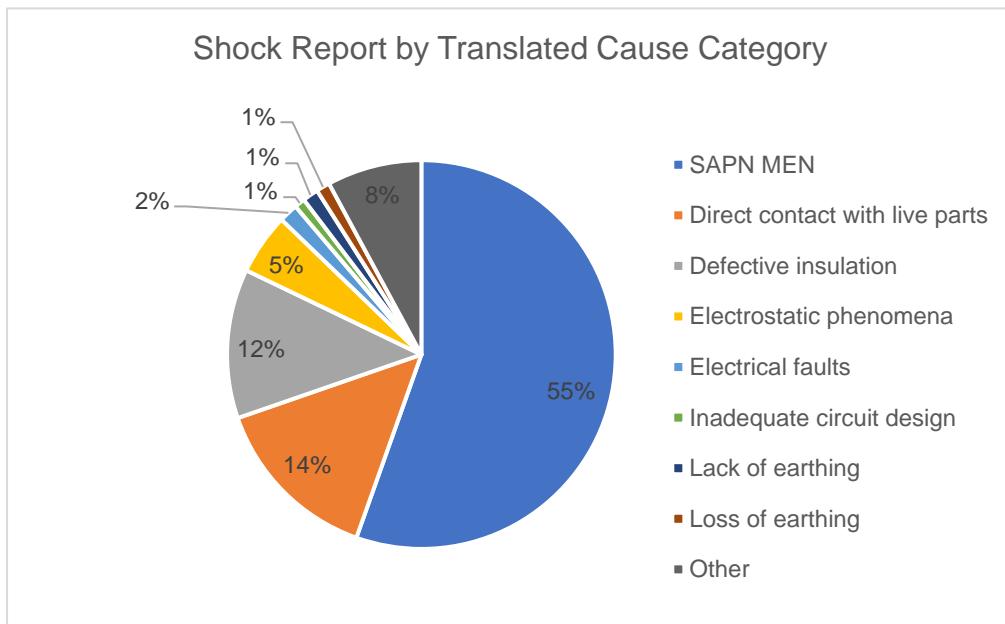


Figure A1 E4: Shock Report for 2021-22 Financial year by Translated Cause Category

Section A4: Electrical Products

The OTR 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. The OTR had a total of 104 applications for product approval, there were 13 desktop audits undertaken, and 9 product related incidents were investigated.

No voluntary recall notices were issued following negotiations with the suppliers.

Section A5: Electrical Safety Awareness

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

- Ensured OTR engineers frequently made site visits to share information about working safely near powerlines with building industry companies and local councils and provided advice on safety and regulatory compliance of buildings and structures.
- 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 public.

Volume II – Gas Industry

Section A6: Gas Infrastructure

6.1. 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. Table A1 G1 shows the amount of gas delivered to the State. About 51% of gas delivered in SA was used in generating electricity in 2021-22, which is in line with the previous years.

Table A1 G1: Overview of natural gas delivered to the State

Financial Year	Total amount of gas delivered to SA (peta-joules, PJ)	Amount delivered for electricity generation	Amount delivered to networks
2020-21	81.9 PJ	47.3 PJ	34.6 PJ
2021-22	72.2 PJ	37.0 PJ	35.2 PJ
Variation	-11.8%	-21.8%	1.7%

Figure A1 G1 demonstrates the amount of gas being used to generate electricity in South Australia over the past two years.

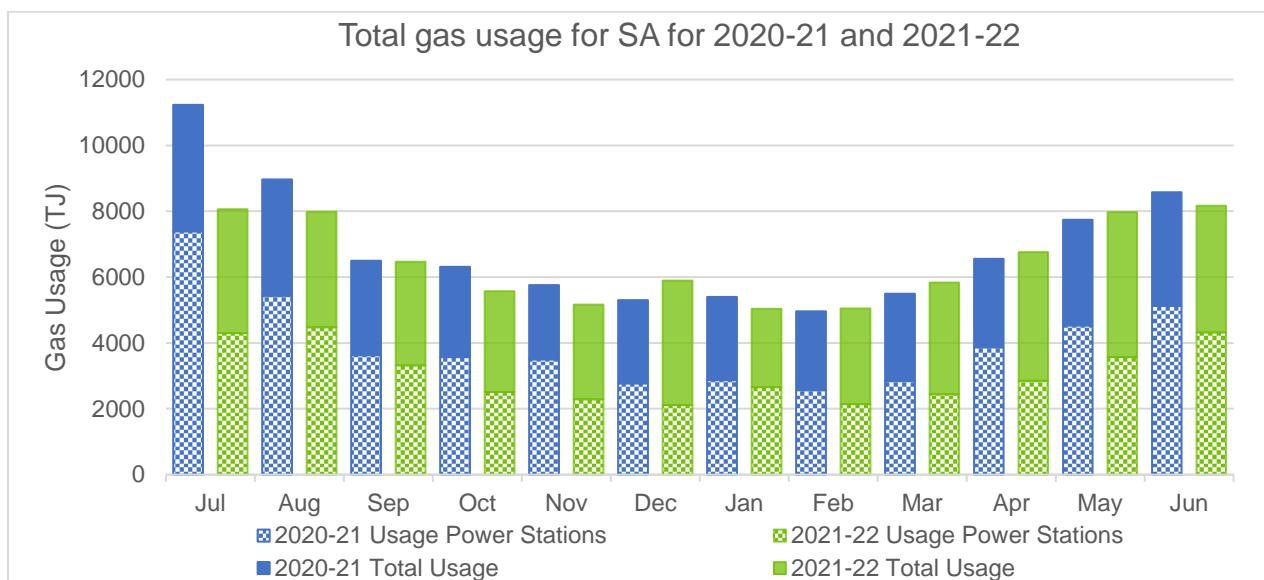


Figure A1 G1: Total gas usage and usage for power generation in 2020-21 and 2021-22

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 A1 G2.

Table A1 G2: Overview of natural gas delivered to the State

Source	2017-18	2018-19	2019-20	2020-21	2021-2022
South Australia	13%	21%	26%	36%	30%
Victoria	47%	43%	35%	36%	44%
Queensland	40%	36%	39%	28%	26%

In 2021-2022, as indicated on Figure A1 G2, the majority of gas was delivered from Victoria. This was in equal portion to that reported in the previous year (and which has been observed historically).

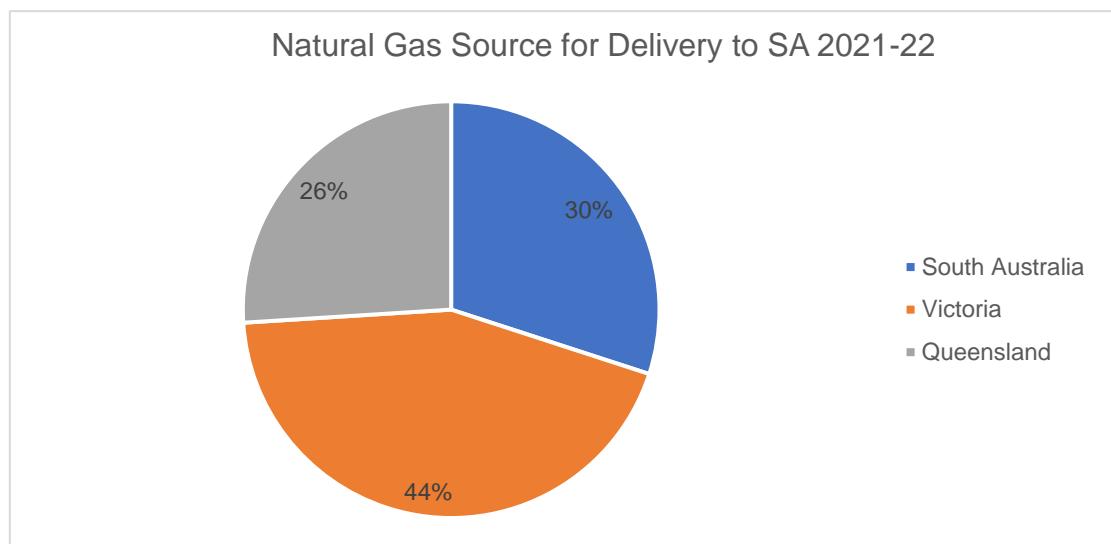


Figure A1 G2: Natural gas delivered to the SA in 2021-22

It can be seen from Figure A1 G3, that the overall amount of gas supplied to the networks in 2021-22 has slightly increased from 2020-21. Despite the slight increase in 2018-19 and 2021-22, there has been a steady decline while the total number of consumers increased by 5,264 last financial year, with the distribution of consumers across the State demonstrated in Table A1 G4.

Table A1 G3: Annual quantity of gas entering AGN's SA networks (including Farm Taps)

Transmission pipeline	Gas Quantity (tera-joules, TJ) (1 July 2021 – 30 June 2022)
Moomba and QSN (MAP Gas)	14,762
SEAGas	390
South East	6,596
Farm Taps	9,684
TOTAL	31,432

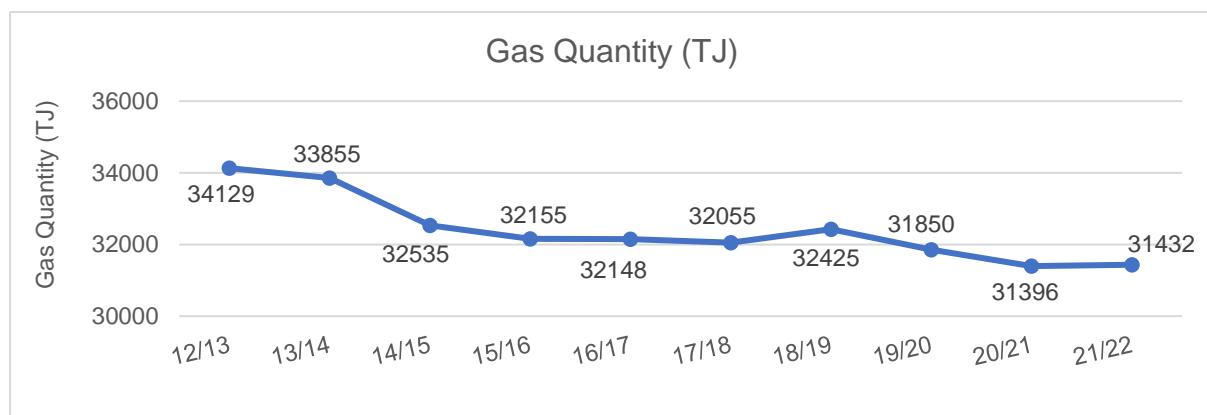


Figure A1 G3:Trend in the quantity of gas entering the distribution system over the last 10 years

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

Table A1 G4: Approximate number of consumers in the natural gas distribution networks in South Australia

Network location	Consumers (as of 30/06/2022)
Adelaide (including Virginia, Waterloo Corner & Two Wells)	449,481
Whyalla	4,222
Port Pirie	5,479
Mount Gambier	9,414
Peterborough	77
Nuriootpa	1,301
Angaston	388
Tanunda	322
Berri/Glossop	108
Murray Bridge	494
Freeling/Wasleyes	376
Total	471,662

The number of consumers connected to natural gas has been steadily growing over the years as demonstrated on Figure A1 G4.

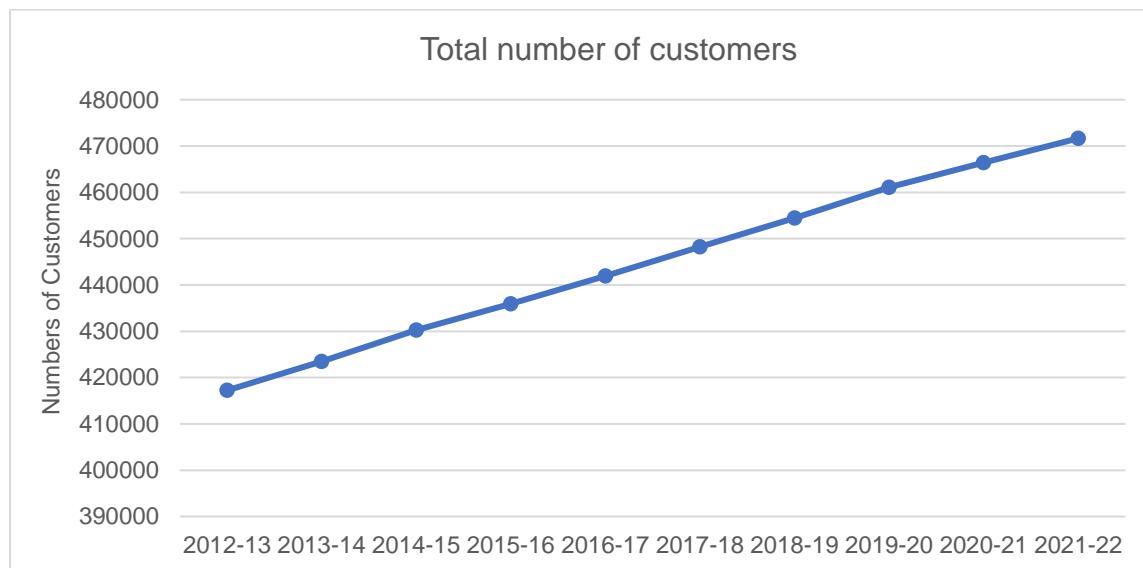


Figure A1 G4: Numbers of consumers in the natural gas distribution networks over the past 10 years

6.2. Gas Infrastructure

6.2.1. Natural Gas networks

In July 2019, Enwave Tonsley Pty Ltd commenced gas supply to the embedded natural gas distribution network at the new residential site at the Tonsley Innovation District. In September 2020, the Technical Regulator was advised that Enwave Tonsley Pty Ltd became CleanPeak Energy Tonsley Pty Ltd ('CPE') and the CPE gas distribution licence was issued by the Essential Services Commission of South Australia ('the Commission') which reflects this change of name. As a result of the change, the Technical Regulator reviewed and approved the appropriate changes which CPE has incorporated into their Safety, Reliability, Maintenance and Technical Management Plan.

The embedded network is a reticulated natural gas network with a capacity to supply approximately 850 residential customers and 20 commercial customers. Gas is supplied to the embedded network from the Australian Gas Networks (AGN) natural gas distribution system via a non-pressure regulated metered supply point. As of 30 June 2022, there were 107 customers connected to gas supply at the site. In 2021-22, the network has been operated in conformance with the Safety, Reliability, Maintenance and Technical Management Plan approved by the Technical Regulator.

6.2.2. Hydrogen Park SA (HyP SA)

In 2021-22, AGN provided the regular updates to the Technical Regulator on the details and progress of a 5% hydrogen blended renewable gas project (HyP SA) at the Tonsley Innovation District.

From 19 May 2021, around 720 properties at the suburb of Mitchell Park, adjacent to the Tonsley Innovation District, have received 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 emissions 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.

AGN updated the Technical Regulator on the results of sampling and testing to confirm the blending within the networks. The results showed that the blending was maintained throughout the networks and no dilution of odorants took place.

AGN informed the Technical Regulator of their intention to expand the current blended network to an additional 3,000 customers. The Technical Regulator was supportive of the proposal, and it will form part of the next approval of AGN's SRMTMP.

6.3. Safety of Natural Gas Infrastructure

In August 2021, AGN submitted a revised Gas Measurement Management Plan (GMMP) for 2021-2022 which was reviewed and approved by the Technical Regulator. From July 2020, the Technical Regulator is responsible for an approval of the GMMP following the changes made to the Gas Metering Code by the Commission.

Despite the slight increase in the numbers of overdue gas meters, in 2021-2022, the Technical Regulator was pleased with AGN's performance (Table A1 G5 and Figure A1 G5). The Technical Regulator was advised that the appropriate measures implemented by AGN (e.g. new program to organise access to meters and a process change in the way meters approaching the end of their approved service life are identified) contributed to the reduction and likely to trend downward the numbers in the future.

Table A1 G5: Overdue gas meters in 2019-20, 2020-21 and 2021-22

Overdue Gas Meters	With 10-year life	With 15-year life
As of July 2020	389	239
As of July 2021	299	165
As of July 2022	405	117

Figure A1 G5 demonstrates overdue gas meters over the last 7 years.

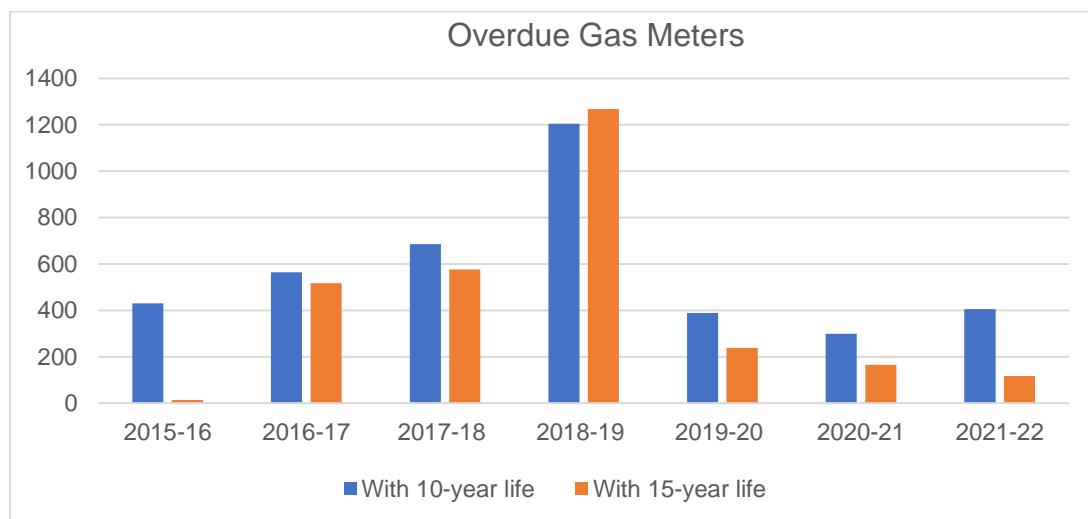


Figure A1 G5: Overdue gas meters over the past 7 years

6.3.1. Safety Reliability Maintenance and Technical Management Plan (SRMTMP)

In August 2021, AGN submitted 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 are some concerns 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 September 2021, the Technical Regulator approved the CleanPeak Energy Tonsley Pty Ltd 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 CleanPeak Energy's operations and maintenance staff ensure safe, reliable and sustainable management of the network.

The Technical Regulator noted 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.

6.3.2. Auditing for safety and technical compliance

During 2021-2022, 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 2020-21.
- Terrorism and Cyber Attacks Risk Management – review as to how AGN and APA evaluate and respond to potential security threats, counter-terrorism alerts and cyber-attacks that may impact on critical gas distribution infrastructure, facilities, security of gas supply and personnel.
- APA's management of third-party interference/incidents – review how APA manages the notification, response, repair, investigation, and communications processes regarding all reported inferences and incidents caused by third party.
- Systems and procedures to fulfil APA's obligations with respect to installations, operations, maintenance and emergency preparedness of the regional gas distribution network in Mount Gambier.
- Internal monitoring, auditing and reviewing of APA's SRMTMP implementation – review what is APA internally auditing, how does verification audit process work, how are actions tracking and monitoring processes managed and reported.
- Field processes/practices for design, installation (e.g. joining, squeeze-off etc.) of polyethylene (PE) pipes at the multiuser sites and the management of APA's responses to gas outages/incidents at the sites.
- Current APA practices for selection, installation, repair and testing of domestic and I&C meters – review APA's processes from assuring that the AGN gas meters are appropriately selected, installed, maintained and tested.
- APA's processes for new gas connections to new domestic, industrial, and commercial (I&C) premises – review whether APA actively follow up the appropriate process starting from the notification of a new connection to the selection and setting up of the meter.
- Distribution Mains and Services Integrity Plan (DMSIP) – review APA's compliance for 2021-22 (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 (2022-23). Review the mains replacement prioritisation process. Review an 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 2021-22 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 appropriate 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.

6.3.3. Gas incidents

There were 14 major outages in 2021-22 (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 2021-22 was slightly lower than the number of major outages (20) in 2020-21.

In 2021-22, the Technical Regulator continued to support 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.

6.3.4. Gas leak reports

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 A1 G6 provides the trend in these parameters for the last five years.

Table A1 G6: Data reported by the APA group over the last five years

Data reported by APA	2017-18	2018-19	2019-20	2020-21	2021-22
Third party damage	620	665	537	460	475
Gas leak public reports (excluding third party)	1,986	1,673	1,600	1,304	1,545
UAFG (tera-joules, TJ)	716	692	603	437	392

During 2021-22, APA Group provided approximately 94,602 location services to various third parties via DBYD, higher than 2020-21 (88,785). This highlighted the impact of the reduced construction activities during the Covid-19 lockdowns in 2020-21 but also indicating that the South Australian public is aware of using the DBYD service to minimise the risks of gas incidents.

Public reports for gas leaks have slightly increased over the last year, 2,020 recorded for 2021-22 (Figure A1 G6) which can be divided between:

- 1,545 publicly reported gas mains and services leaks.
- 475 public reports of third-party damage.

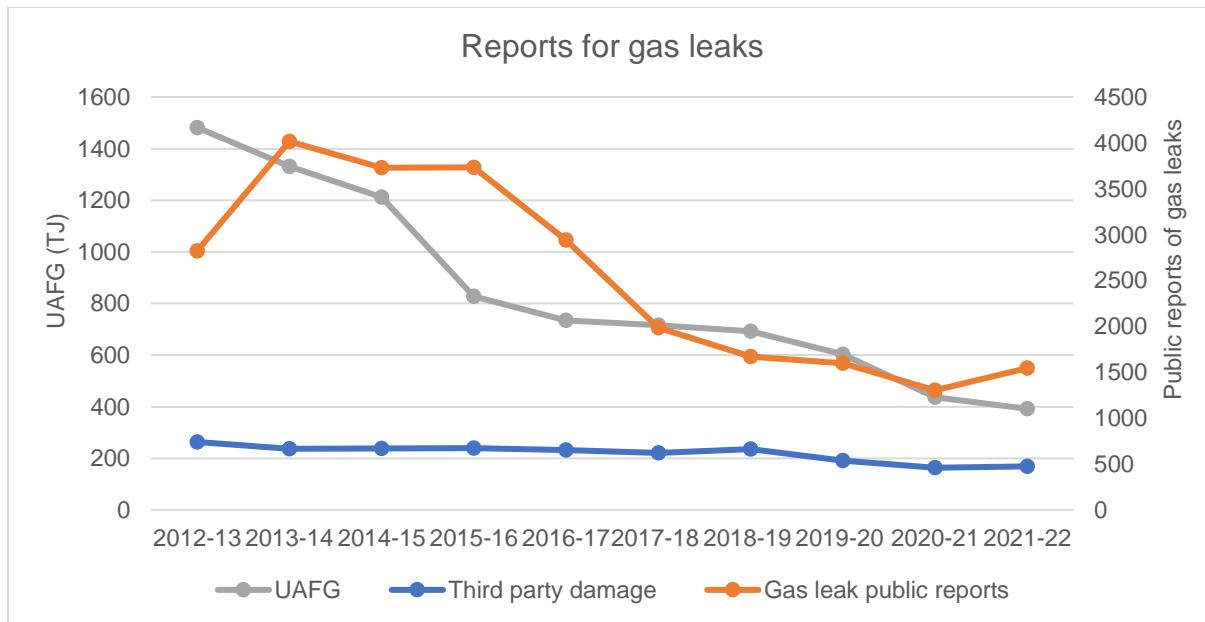


Figure A1 G6:Numbers of public reports of gas leak and UAFG

The Technical Regulator noted that the reported UAFG value was 392 TJ, based on the Australian Energy Market Operator (AEMO) calculations (as of 30 June 2022). This has greatly reduced over the last 10 years (Figure A1 G6). This value represents approximately 1.3% of the total quantity of gas that entered the distribution system (including Farmtaps) and approximately 1.8% (excluding Farmtaps). The great reduction of UAFG seems to be mainly attributed to the amount of

cast iron and unprotected steel mains replacement which AGN carried over the last 10 years. This significant decreasing trend in UAFG to 392 TJ is a pleasing outcome indicating improvement into the integrity of the AGN distribution networks, reliability of gas supply and the significant reduction of methane emissions into the atmosphere.

The Technical Regulator has also supported and promoted a use of six videos produced by [SafeWork SA](#) for all industry stakeholders which address the appropriate safety and procedural steps to be undertaken by third parties working in the proximity of the utilities' assets to reduce the safety risks to the public in South Australia. These videos have been established following a number of Utility Asset Strike Avoidance' workshops organised by SafeWork SA in which the Technical Regulator has participated.

6.3.5. AGN mains replacement program

Following a review of the AGN mains replacement program (as AGN reported to the Technical Regulator in 2020-21), the Technical Regulator noted that AGN has replaced approximately 152.9 km of old cast iron, unprotected steel and HDPE gas mains. The overall progress of mains replacement was approximately 8.6 km below the AGN annual target of 161 km, due to the impacts of Covid-19.

The Technical Regulator is pleased that AGN has achieved its annual regulatory target of mains replacement in the Adelaide Central Business District (CBD) in 2021-22 and has successfully completed all of the Adelaide CBD mains replacement program with all extreme risks removed.

AGN advised the Technical Regulator that it has budgeted to replace a further 161 km of gas mains in 2022-23. The Technical Regulator noted that, in addition to block low pressure cast iron and unprotected steel mains replacement (86.5 km), AGN will continue work in 2022-23 on the replacement of 47 km of HDPE mains prioritised as locations of greatest risk.

Generally, the Technical Regulator supports most of the technical/field activities which AGN proposed to carry out on the gas distribution networks in South Australia to ensure safety and reliability of the networks over the five years of the AGN Access Arrangement. The AGN mains replacement program during the 2021-26 Access Arrangement period was the major issue for the Technical Regulator's consideration.

6.4. Safety of LPG Distribution Networks

The Technical Regulator was advised by ELS about a further expansion of the LPG distribution network at the Bluestone Estate development in Mount Barker. In 2021-22, The Bluestone Estate development was close to completion, with approximately 1,553 customers connected to the LPG distribution network.

The Technical Regulator monitored the progress of the construction of ELS' new LPG distribution networks in Mount Barker located at the Aston Hills Estate (300 customers already connected with the potential to increase to approximately 1,900 customers), the Springlake Estate (409 customers connected) and at Newenham Estate (228 customers connected).

The Technical Regulator was advised that, in 2021-22, ELS continued the construction of the LPG networks at the 2 new developments in Mount Barker (Hawthorn Road, 34 connection and Emerald Way, 55 connection). In addition, in 2021-22, AGN continued the construction of its own LPG distribution network at the Glenlea Estate in Mount Barker with approximately 101 customers connected to the network. 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 A1 G7: LPG distribution networks under development in South Australia

Network Location	Owner/ Operator	Length of Main (m)	Operating Pressure (kPa)	Number of customers
Mount Barker (Bluestone Estate, Lifestyle Village and Scarlet Crest Estate)	ELS	19,343	120	1,578
Mount Barker (Springlake Development)	ELS	6,133	120	408
Mount Barker (Aston Hills Development)	ELS	5,600	100	300
Mount Barker (Newenham Development)	ELS	3,886	70	228
Mount Barker (Hawthorn Road)	ELS	1,086	70	34
Mount Barker (Minters Fields Development)	ELS	4,260	100	338
Mount Barker (Amblemead Development)	ELS	1,777	120	198
Mount Barker (Blefari Development)	ELS	5,522	100	313
Mount Barker (Matilda Rise Development)	ELS	663	70	42
Mount Barker (Clover Park Development)	ELS	3,135	70	200
Mount Barker (The Lodge Development)	ELS	330	70	54
Mt Barker (Adore Development)	ELS	188	70	28
Mount Barker (Glen lee Development)	AGN	3,700	100	101
Mount Barker (Emerald Way)	ELS	680	100	55
Clare (Hanlins Rise Estate)	Elgas	1,900	140	65

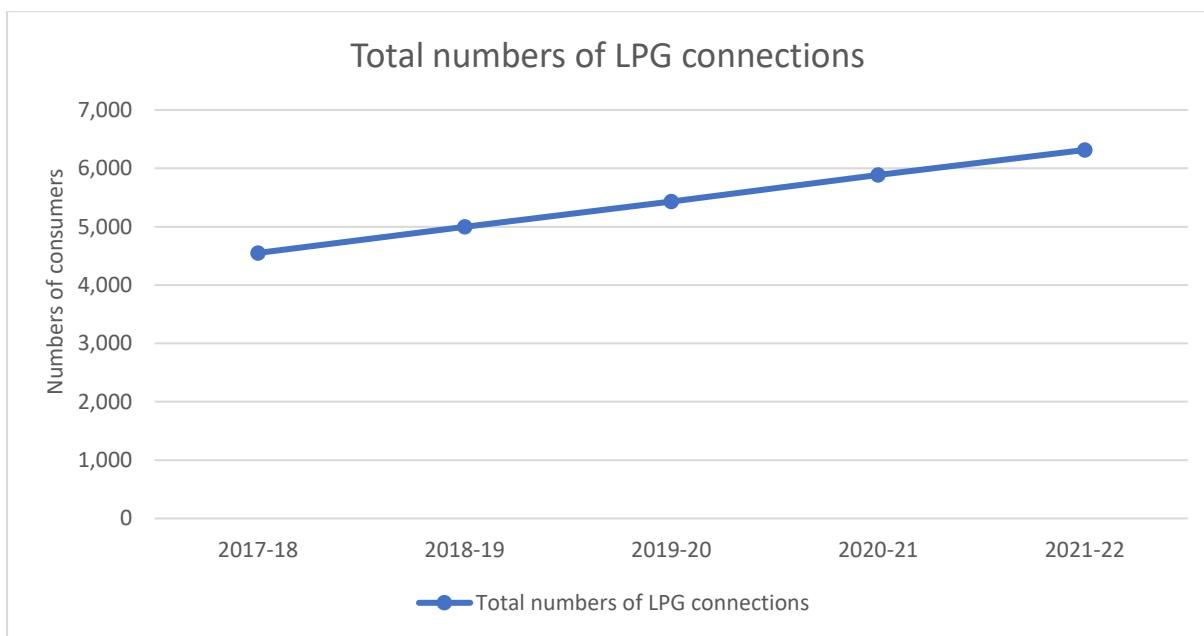


Figure A1 G7: Total numbers of LPG consumers over the past 5 years

6.4.1. Auditing for safety and technical compliance

In 2021-22, 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 LPG distribution networks in South Australia (i.e. Origin Energy LPG at Cape Jaffa Anchorage, Victor Harbor, Renmark, Port Lincoln and Wallaroo, ELS at Mount Barker and Elgas Ltd at Clare). The Technical Regulator's general finding from the audits was that the operators of the LPG networks had adequate systems in place for most of the areas audited to ensure the safe operation of their LPG networks.

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

6.4.2. Incident reporting

There were no deaths or personal injuries from the LPG distribution networks incidents in South Australia during 2021-22.

ELS reported to the Technical Regulator that there were 17 gas leaks reported to ELS from the LPG distribution networks in Mount Barker in 2021-22. All of them have been promptly repaired by ELS's field staff. Not all were actual gas leaks, some were identified as false alarms.

Section A7: Gas Installations

7.1. Natural Gas and LPG Installations

7.1.1. 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, pipework, flueing and ventilation where necessary. The following table shows the approximate number of new or modified installations and connections over the year.

Table A1 G8: New or modified installations and connections

	2018-19	2019-20	2020-21	2021-22
New domestic and light commercial appliances installed	20,667	25,477	26,124	25,207
Existing installations that required replacement	11,940	13,135	12,267	11,299
New natural gas connections to distribution network (residential & commercial/industrial)	7,979	8,323	8,005	7,433
New reticulation LPG connections to residential and light commercial premise	447	393	410	426

In larger new residential developments such as Mount Barker Estate where natural gas is not available, LPG (Propane) is supplied by means of reticulated gas network systems supplied from large storage tanks located on the perimeter of the estate.

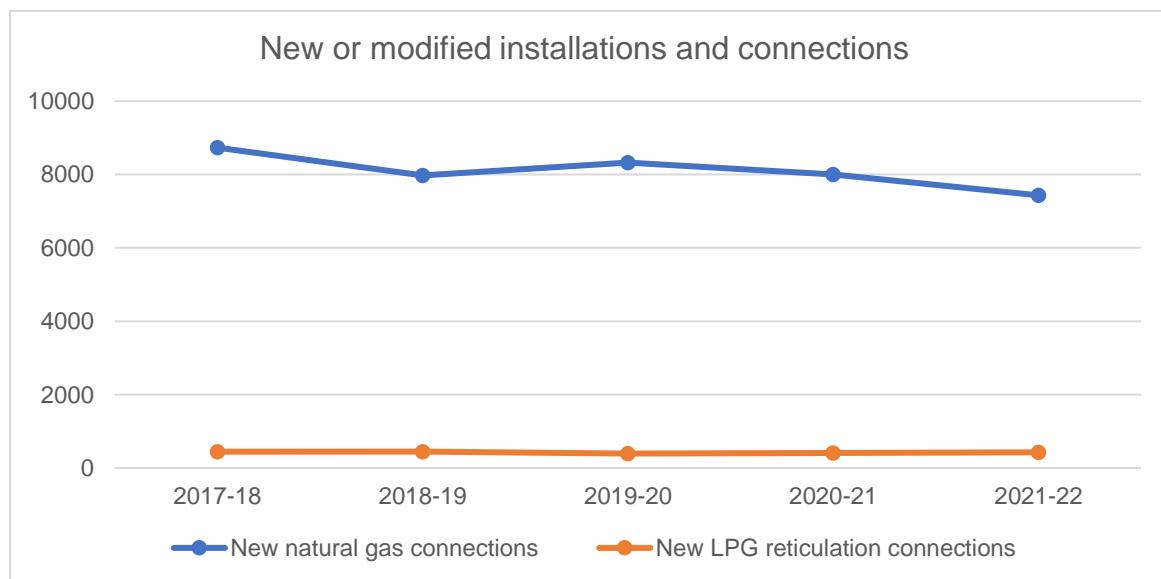


Figure A1 G8: New natural gas connection and reticulation LPG connection the past 5 years

7.1.2. Industrial and Large Commercial Gas Installations

The OTR monitors industrial and commercial, elevated pressure and complex gas installations in the design and construction phases. There were several complex projects throughout the 2021-2022 period such as the Yatala Prison redevelopment and Samara Engineering 200 kPa installation. The

OTR undertook desktop reviews of all initial designs and visited the work sites on numerous occasions for each project to review the newly constructed work for compliance. Where compliance issues were identified the installations were modified by the contractors to meet the deemed to satisfy requirements of AS/NZS 5601.1 gas installation standard.



Figure A1 G9: Gas installations in near completion at Yatala Prison Redevelopment and Samara Engineering

7.1.3. Industrial and Commercial Type B Appliances

There is a legislative requirement for Type B (industrial) gas appliances to be certified to AS 3814 before commercial operation. The OTR monitors Type B appliance certifications through accredited certifiers. Submissions are provided to certifiers by equipment suppliers, manufacturers, or commissioning agents for desktop review. If satisfactory, temporary commissioning gas is granted. The equipment can then be commissioned under supervision before on-site safety testing and certification. The OTR monitors Type B appliance certifications by certifiers. In the 2021-22 period, there were 146 Type B appliances tested and certified.



Type B appliances are individually tested and certified by private certifiers accredited by the Technical Regulator prior to commercial operation.

Figure A1 G10: Photo of a type B steam boiler

7.1.4. Investigation

The OTR reactively investigates complaints and reports of incidents / accidents involving gas installations and appliances. The following snapshot illustrates some of the examples of cases attended throughout 2021-22. With the emergence of Covid-19 the OTR has enacted effective management plans to reduce the risks to employees and the public. Those plans are regularly reviewed to maintain currency given government advice in response to community infection rates and restrictions.



Figure A1 G11 shows multilayered composite piping installed outdoors. Composite piping is not UV stable and cannot be used as a final connection to a gas appliance. This unit complex site was investigated after the OTR received a complaint from the network operator.

Figure A1 G11: Failed outlet service



Figure A1 G12 showing DIY gas work by a homeowner. Inspectors visited the premises, made safe and defected the installation. Homeowner instructed to engage a licensed gas fitter to remediate the installation.

Figure A1 G12: DIY gas work

7.1.5. Auditing for Compliance

Proactive Audits

27,173 residential and light commercial gas installation jobs were completed in South Australia during 2021-22 and of these installation jobs 1,044 were audited in this manner. While auditing, the processes were changed to adapt to the constraints imposed by the Covid-19 pandemic. Audits were

targeted towards outdoor gas appliances, while auditors were given PPE and training to minimise risks of interfacing with customers. Customers were vetted with health questions and employees were monitored to ensure health markers were met.

Table A1 G9: Results of installation auditing

Area of Audit	2017-18	2018-19	2019-20	2020-21	2021-22
Domestic/light commercial audits	1,353	1,419	1,542	1,427	1,044
100% Domestic safety checks at all new meter connections *	8,732	7,979	8,323	8,005	7,433
I&C audits	82	97	80	76	206
Caravan & tourist park gas safety audits	9	0	0	0	7
Caravan Retailer audits **	-	13	23	4	1
Complaints resolved	633	605	421	462	426
Investigative interviews	3	6	4	2	1
Warning letters sent	169	150	147	106	73
Expiation notices issued	0	0	1	3	0
Referrals to Consumer and Business Services (CBS) – re: licensing issues	2	7	3	3	1
Referrals for remedial training. (<i>Self-initiated enrolment</i>)	2	1	1	2	0

* 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.

1,123 large commercial and industrial gas installations were completed during 2021-22 and the Technical Regulator proactively audited 206 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 A1 G13: Type B hot water heater and overhead pipework inspection audited by an Authorised Officer

Audits of permanent gas installations at tourist and caravan parks

One model of caravan was audited at a caravan retailer during 2021-22. The inspection was part of an ongoing investigation scoping faulty cookers for caravans and motorhomes which form part of a product recall investigation listed with the ACCC. Seven further caravan and caravan park installations were audited.

Installation Audit Results

The number of proactive audits of residential and light commercial installations that were completed in the year was 1,044, with a split of 803 inspections for natural gas versus 241 for LPG installation. LPG installations are audited at a higher relative rate for the population base for several reasons:

- LPG 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 73 warning letters were issued during the year, 53 to gas fitting contractors, 20 warning letters to owners. No expiation notices were issued in 2021-22. The Technical Regulator prefers that non-conformances are addressed and rectified by the gas fitter as part of their remediation of work and education. This results in a positive outcome for the consumer in that the installation is made compliant and the gas fitter actively learns from their mistake. Gas fitters also lose income earning opportunities while rectifying their work. Taking legal action may introduce the risk of not facilitating remediation of the actual non-conformance.

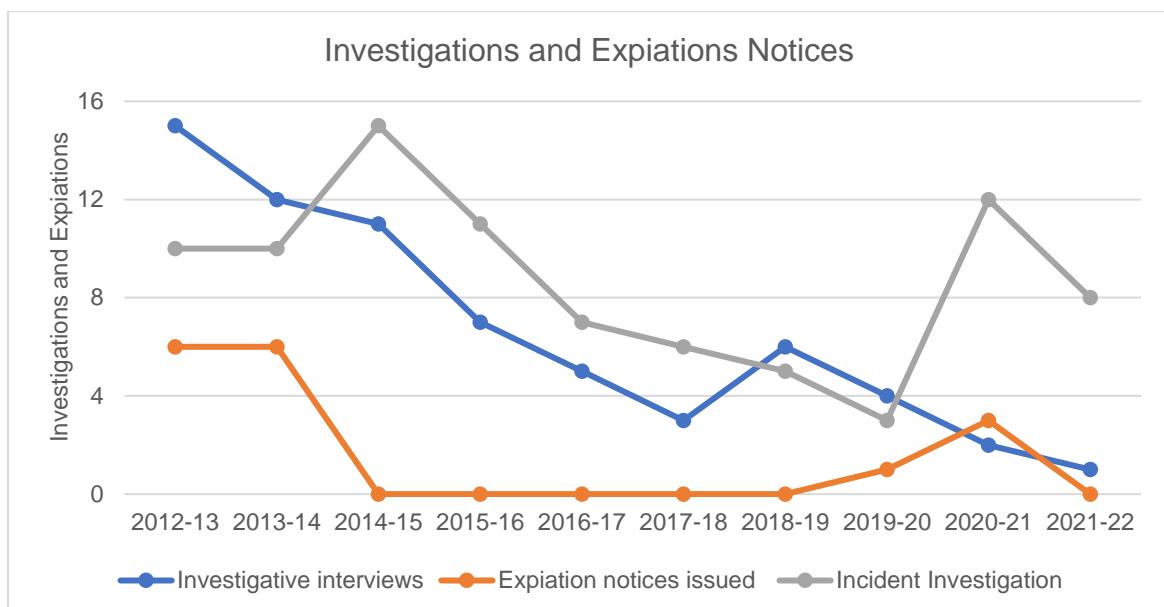


Figure A1 G14: Investigations and Expiation Notices

Referrals to CBS

There was one referral to CBS during the year. People found to be performing gas installation work whilst unlicensed, unregistered or performing work outside the scope of their licence or registration are referred to the licensing authority CBS for action. CBS investigates the matters and considers the recommendations made by the Technical Regulator in making their deliberations.

Tier 2 certification

Previously there were 2 local contractors in SA that conducted safety assessments of uncertified commercial catering appliances, the OTR would review their test results and if correct issue a certificate to the owner of the appliance.

The OTR decided to change this arrangement to involve a conformance assessment body (CAB) to undertake the safety assessment and certification of these appliances. IAPMO Oceana has agreed to undertake Tier 2 (safety assessments) for SA.

Testing is only available to uncertified Type A commercial catering equipment that are not readily available in Australia. For other individual and unique appliances that are not readily available in Australia, these will need to be assessed on a case-by-case basis at the discretion of IAPMO.

Uncertified Type A appliances that are **not** suitable for Tier 2 certification include:

- Gas water heaters.
- Space heaters.
- Domestic cookers.
- Decorative log fires.
- Central heaters.
- Hydronic heating boilers.
- Pool / spa heaters.
- Recreational boat and caravan appliances.

7.1.6. Gas incidents – Installations

In 2021-22, there were a total of eight gas related incidents resulting in injury or property damage. Four reported incidents were LPG and four were for natural gas. They were all investigated and are summarised as follows:

- House fire: small gas leak in the outlet service that built up in the ceiling cavity which reached the lower explosive limit of gas / air ratio and ignited when the central heater was tuned on causing an explosion and extensive damage to the house. No fatalities or injuries reported.
- Low gas pressure incident: a Rheeem Stellar delayed ignition where unburnt gas had accumulated within the HWS combustion chamber and internal flue when the thermostat called for heat, delayed ignition caused an explosion and damaged the HWS which required replacement. No fatalities or injuries were reported.
- Gas burner compliance issue: this was reported by a gas fitter, that when converting from NG to LPG it was difficult to control the flame on one of the burners. The appliance was sent back to Italy for inspection and found the jet was not at 90 degrees to the venturi. Smeg have issued a rework kit.
- 9kg LPG cylinder and ring burner incident occurred after the occupant connected the ring burner in the backyard. Occupant lit the ring burner, which ignited gas escaping from the cylinder POL connection, which was not leak tested before lighting the burner. The ensuing fire ignited nearby combustible materials that caused extensive damage to the rear of the house. Minor burns to occupant's hands were reported.



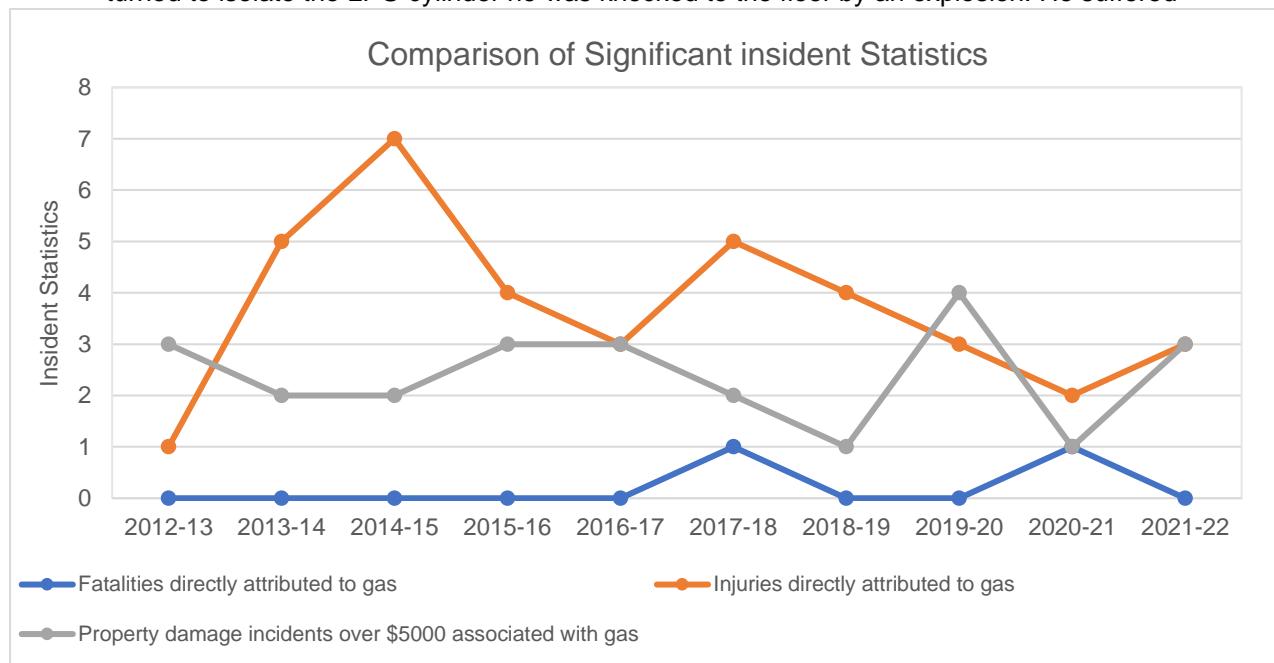
Figure A1 G15: LPG ring burner caused house fire

- Gas contractor installed a natural gas cooker to LPG without converting. Several complaints were raised by staff members and the gas fitter returned twice and said there was no leak and Mount Barker gas burns differently to town gas. A second gas fitter was called after the chef was admitted to hospital for tests and realised the gas cooker was burning the wrong fuel. The original gas fitter was reported to CBS and his gas licence was removed until he completes combustion training.
- Fire investigation: An uncapped ball valve in the lounge room was bypassing gas which allowed a build-up of gas to reach the lower explosive limit of gas/air ratio which ignited on an unknown ignition source causing an explosion and a subsequent fire which caused extensive damage to the property.



Figure A1 G16: Explosion and fire at a residential property

- Demolition contractor damaged a gas pipe in a bathroom floor, could not find gas isolation valve, MFS were called, MFS could not isolate the main gas meter as there was no handle, they eventually found an isolation valve in the lobby of building. APA were called to site to monitor gas readings.
- Owner was using cook top and saw flames burning around the cook top knobs, and as he turned to isolate the LPG cylinder he was knocked to the floor by an explosion. He suffered



slight burns to his face and lost facial and arm hair. A brass flared nut was split but not leaking. A burner tube seemed to be the source of leak.

Figure A1 G17: Comparison of Significant Incident Statistics

7.1.7. Electronic Gas Certificates of Compliance (eCoC)

The Gas Installation and Appliance Safety team have developed a new system to generate gas safety audits by utilising the electronic Certificates of Compliance (eCoC) email delivery platform. When a contractor/worker submits a gas eCoC, the recipient receives an email with a .pdf eCoC attachment, and in this email there is a link for the recipient to nominate an expression of interest to have the gas work indicated in the eCoC safety checked. When the recipient clicks on the link all they need to do is add the gas eCoC number, email address and confirm their contact details are correct, and then a case number is automatically created in PEGI and placed in the audit dashboard for the inspectors to

access. The inspector simply contacts the recipient either by phone or email and arrange for a site visit to complete the audit. Emails can be dispatched in real time, thus improving communications with recipients to give them an option to have the recent gas work completed audited and safety checked. This process has been designed to increase efficiency for the gas team to create auditing opportunities.

7.1.8. 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 approximately 7,095 technical enquiries relating to gas installations or appliances.

The Technical Regulator has developed several technical guides and 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

All public speaking events and presentations were cancelled due to staffing shortages within the gas installation and appliance safety team.

Section A8: Gas Products

The program to audit and monitor retailer stores, with a view of eliminating the sale of uncertified gas appliances in South Australia, targeted major, larger retailers that sell gas appliances e.g. Bunnings, as well as minor retailers and small stores 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. A risk-based approach has been used to monitor physical stores.

Currently, the primary issue is the regulation of appliances sold via online marketplaces, i.e. eBay, Facebook marketplaces or Amazon. The OTR has been collaborating with Consumer and Business Services (CBS), the Australian Competition and Consumer Commission (ACCC) and other regulatory agencies in other jurisdictions to achieve better outcomes at a national level. The formation of a working group with other regulators aims to identify ways which reduce the risk of unsafe electrical and gas appliances sold via online marketplaces to Australia and New Zealand consumers. The working group objective is to increase consumers and suppliers/distributors' awareness regarding certification requirements through education and to reduce sales of unsafe appliances through marketplaces as well as finding effective ways of monitoring marketplaces.

Over 2021-2022, the OTR monitored online marketplaces; eBay and Facebook marketplaces. The OTR was able to identify 35 uncertified gas appliances being sold to South Australian consumers through these marketplaces, and was successful at removing 60% of the uncertified appliances.

Section A9: Gas Regulatory Coordination

9.1. 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.

9.1.1. AG-001, Gas Appliances Committee

In 2021-22, 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 early 2023 with the final catch-up draft of the central Part 0 Standard.

The following projects were undertaken during 2021-22:

- Publishing of AS 2658 LPG portable and mobile appliances. The Standard was revised to align to 5263.0 while remaining an independent standard.
- Publishing of AS 4563 – Commercial catering gas equipment.
- Completion of draft of AS/NZS 5263.0 – General Requirements, the draft went through public comments in early 2022 and will go through a second round of public comment in late 2022 as significant technical changes occurred based on the comments received. Publication is expected in 2023.
- Project proposal approved to include Nb gas into Type A standards, for standards which have not included limit gas testing for historical reasons. AS 4563, AS/NZS 5263.1.4, AS/NZS 5263.1.7, AS/NZS 5263.1.10 and AS/NZS 5263.1.11.
- Joint project between AG-001 and ME-093 members to put together an Australian Technical Specification for the design and manufacturing of hydrogen appliances based on existing Australian Standards.

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

In 2021-22, the Technical Regulator participated in the AG-008 Gas Distribution committee as a representative of the GTRC. The committee members carried out numerous discussions throughout the year using Microsoft Teams and through on-site meetings 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 amendments for the Committee's 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, biomethane and biogas. The issues related to gaps in legislation and technical and standards requirements to enable safe blending of hydrogen, biomethane and biogas in gas distribution networks represented the main focus of the recent discussions between the Committee members.

During the Committee's activities, the Technical Regulator communicated information to and from industry stakeholders (e.g. gas distribution networks operators, Future Fuels Cooperative Research Centre (FFCRC) researchers, the public in South Australia, and GTRC) and Standards Australia (e.g. ME 093 Committee- Hydrogen Technologies) to ensure that their views are represented in the development of the future improvement to AS/NZS 4645.

9.1.3. AG-010, Natural Gas Quality Specifications

The Technical Regulator is a member of the AG-010 Natural Gas Quality Specifications Committee as a representative of the GTRC. The committee is principally responsible for the review of AS 4564 – General Purpose Natural Gas which had last been published in June 2020.

AS 4564 lists the general characteristics of natural gas to be used for industrial, commercial or domestic use. Most jurisdictions call up this Standard in their legislation relevant to natural gas.

In 2021-22, AG-001 did not undertake any specific activity, however, it is expected that in the future the Committee will reconvene to discuss adding hydrogen into the Standard.

9.1.4. ME-093 Hydrogen Technologies

In 2021-22, the Technical Regulator participated in the ME-093 Committee as a representative of the GTRC. This Committee was created as a mirror committee of the International Standard Committee ISO TC 197.

It incorporates a broad scope including hydrogen fuel cells, generators, production, storage, transport, use in networks and appliances and liaises on a regular basis with other Standards Australia Committees to identify gaps in Standards in regard to hydrogen.

The Technical Regulator is also involved with two working groups within ME-093, one related to gas distribution networks and one related to gas appliances, which are responsible for developing guidance documents for the industry as the first step of developing specific hydrogen Standards.

The following projects were undertaken during 2021-22:

Publishing of the following standards:

- AS 62282.3.300:2021 - Fuel cell technologies, Part 3.300: Stationary fuel cell power systems – Installation (IEC 62282-3-300:2012 (ED.1.0), MOD).
- AS ISO 19880.5:2021 – Gaseous hydrogen – Fuelling stations, Part 5: Dispenser hoses and hose assemblies.
- AS ISO 19880.8:2021 – Gaseous hydrogen – Fuelling stations, Part 8: Fuel quality control.
- AS 62282.3.100:2021 – Fuel cell technologies, Part 3.100: Stationary fuel cell power systems – Safety (IEC 62282-3-100:2019 (ED.2.0), MOD).

Development of the following documents with publication expected later in 2022:

- AS 19880.1 – gaseous hydrogen – fuelling stations – Part 1: general requirements.
- AS 62282.2.100 – Fuel cell technologies, Part 2.100 Fuel cell modules – Safety.
- SA TS 5359 – The storage and handling of hydrogen.

9.1.5. AG-006, Gas Installation Committee (AS/NZS 5601)

For 2021-22, the OTR provided committee representation as a GTRC nominated member for a short period from July to September 2021, but this ceased due to the passing of Tom Sika. From June 2022, the new Manager for Gas Installation and Appliance Safety on behalf of the OTR is providing committee representation as a GTRC nominated member. The committee continued to convene throughout the year via Teams' meetings to progress public comments associated with the full revision of AS/NZS 5601 (Part 1 Gas Installations-General installations).

The full revision of Part 1 defines and aligns performance based and deemed to satisfy clauses, revisits and provides additional pipe sizing tables, homogenises defined terms with other standards where possible, introduces new terms and aligns the content to Standards ISO requirements for terms and language.

The revision project AS/NZS 5601.1 is in the final stages and the Committee will be submitting project proposals for amendments and revisions of the following Standards:

- AS/NZS 5601.1:2022, Gas Installations, Part 1: General installations (yet to be published),
- AS/NZS 5601.2:2020, Gas installations, Part 2: LPG installations in caravans and boats for non-propulsive purposes,

If the projects are approved, it would be expected that the Committee works through the drafts of the above Standards, with regular Committee meetings and Working Group meetings as required, working towards finalisation and publication. The commencing meetings (to be scheduled if the projects are approved) will provide clarity around the scope and actions required on this body of work.

Volume III – Water and Plumbing Industry

Section A10: Water and Sewerage Infrastructure

10.1. Regulation of Water Industry Entities

10.1.1. Technical review of licence applications

There were zero licence applications, four licence exemption applications and three licence variation applications received or reviewed during 2021-2022.

10.1.2. Safety, Reliability, Maintenance and Technical Management Plans (SRMTMPs)

The Technical Regulator reviewed and approved the following SRMTMPs during 2021-22:

Table A1 W1: Number of SRMTMPs received, reviewed and approved

Year	SRMTMPs Received and Reviewed	SRMTMPs approved
2021-22	33	25
2020-21	34	26
2019-20	32	29
2018-19	19	14
2017-18	30	16
2016-17	38	23

10.1.3. Water industry entity audits

During 2021-22, a total of 17 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 included in Table W2.

Table A1 W2: Number of audits undertaken in per type of services

Type of services	Audits undertaken 2018-19	Audits undertaken 2019-20	Audits undertaken 2020-21	Audits undertaken 2021-22
Drinking water, non-drinking water and sewerage	1	1	2	3
Drinking water	2	1	1	0
Drinking and sewerage	0	2	0	0
Non-drinking and drinking water	0	1	0	0
Non-drinking water and sewerage	2	1	12	6
Non-drinking water	2	1	3	2
Sewerage	4	3	1	6

TOTAL	11	10	19	17
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The licence type of water industry entities audited is included in Table W3.

Table A1 W3: Number of audits undertaken per type of licence

Type of licence	Audits undertaken 2018-19	Audits undertaken 2019-20	Audits undertaken 2020-21	Audits undertaken 2021-22
Minor	4	6	7	7
Intermediate	6	3	11	9
Major	1	1	1	1
TOTAL	11	10	19	17

The licence type of water industry entities audited is included in Table W3.

10.2. Industry Training

10.2.1. Brown Card Training for South Australia

In May 2022, the OTR launched the SA Brown Card training for water industry entities and water industry contractors in South Australia.

The course was developed by the Queensland Water Directorate and the Water Skills partnership to educate the importance of, and requirements for, maintaining public health, minimising environmental harm as well as general workplace health and safety when working around sewerage and recycled water assets.

The OTR coordinated a review of the original Brown Card in conjunction with other South Australian Government departments to modify the training to include South Australian regulatory requirements. The training is supported by the South Australian Government and is available at no charge to water industry employees and contractors working with wastewater and recycled water in South Australia.

The training takes approximately 90 minutes to complete and consists of information slides and a short quiz. Once the training is complete a “Brown Card” certificate of completion is issued to the participating person and is valid for three years. The SA Brown Card is a non-accredited course but a valuable learning resource for sewerage and recycled water workplace health and safety basics.

Information on how to sign up to the SA Brown Card can be found on the [OTR webpage](#).

Section A11: Plumbing Installations

11.1. Plumbing Compliance

11.1.1. Expiations & Enforcement

The following compliance activities were undertaken between 1 July 2021 to 30 June 2022:

- 6,718 plumbing audits were conducted.
- 23 enforcement notices and 7 warning letters were issued for breaches of the *Water Industry Act 2012*.
- 9 investigations were referred to Consumer and Business Services (CBS).
- 129 compliance investigations were initiated.
- 8 interviews were conducted to discuss non-compliant plumbing installations.
- 7 expiation notices were issued for non-compliant plumbing.
- 4 re-inspection fees were issued.
- 14 plumbing induction interviews were conducted.
- 3 Freedom of Information requests were processed.

Plumbing compliance investigations are instigated as a result of reports from customers alerting the OTR to non-compliant plumbing, or non-compliant plumbing being identified through sample audits of on-site plumbing installations. Plumbing installation audit results are monitored through a fortnightly data review allowing the Technical Regulator to ensure all outstanding non-compliant installations are rectified. The OTR Plumbing Section works with industry to achieve a high level of technical and safety outcomes for on-site plumbing installations in South Australia.

11.1.2. Plumbing Certificates of Compliance

For the period 1 July 2021 to 30 June 2022, 31,552 plumbing Certificates of Compliance were submitted to the Office of the Technical Regulator.

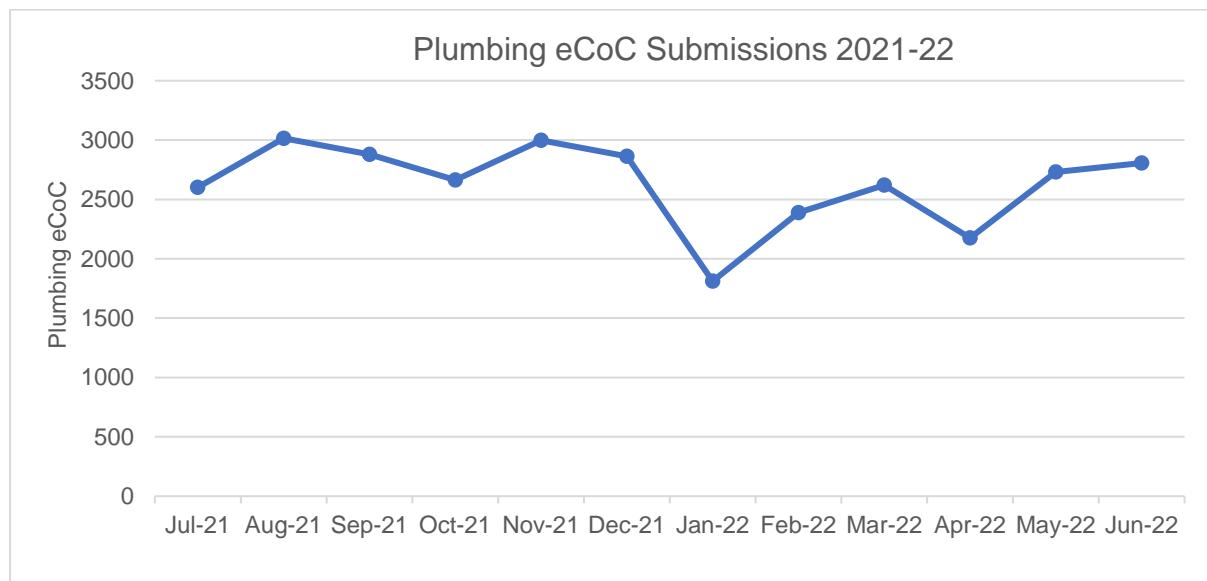


Figure A1 W1: Plumbing Certificates of Compliance statistics

11.2. Plumbing Audits

11.2.1. Plumbing Bookings and Audits

Plumbers are required to notify the Office of the Technical Regulator when on-site plumbing and drainage installations are connected to SA Water infrastructure. Site audits are random and selected within the electronic Certificate of Compliance (eCoC) 'Plumbbookings' case management system. OTR audit allocations depend upon booking type, associated risks and relevant public safety issues

(e.g. in-ground drainage, backflow protection, non-drinking water, in-ground fire services) and contractor's case history.

The Technical Regulator conducted a total of 6,718 on-site plumbing audits and 625 desktop hydraulic design audits in the 2021-22 financial year. On-site audits included 110 final audits on newly constructed residential and commercial developments. Final audits examine the entire components of the on-site plumbing installation.

Table A1 W4: On-site Plumbing Audits 2021-22

Audit Category	Commercial	Residential	Total
Above Ground Sanitary Plumbing	191	1,015	1,206
Relining of Sanitary Drainage Pipework	5	13	18
Sanitary Drainage Installations	277	1,652	1,929
Trade Waste Plumbing	244	N/A	244
Underfloor Plumbing	252	1,945	2,197
Non-Drinking Water (in ground)	3	129	132
Non-Drinking Water (in wall)	6	229	235
Non-Drinking Water Irrigation - Parks/Recreational	1	N/A	1
Drinking Water Irrigation- Parks/Recreational	1		1
Fire Services (in ground)	126		126
Hot Water Heater Installations	14	194	208
Hot and Cold (first fix)	15	70	85
Backflow Audits	65	12	77
Encumbrance Investigation	6	23	29
Site Inspection	21	37	58
Site Meeting	28	8	36
Final Audit	110		110
Sewer Investigations	2	12	14
Water Investigations	6	6	12
Total	1,373	5,345	6,718

Plumbing and drainage installations can range from the addition of a toilet en-suite on a residential home, to more complex commercial and industrial installations within shopping centres, industry, or multi-storey high-rise apartments. All plumbing audits are assessed against the Plumbing Standard (published by the Technical Regulator pursuant to section 66 of the *Water Industry Act 2012*). This Standard has adopted relevant sections of the Plumbing Code of Australia (PCA). All plumbing installations must meet the performance requirements of the PCA through the deemed-to-satisfy

solutions as set out under the AS/NZS 3500 plumbing and drainage Standard or, in some cases, by a Performance Solution in accordance with the performance criteria set out under the PCA. On-site audits have increased in 2021-2022 as Covid-19 restrictions have been eased.

11.2.2. Metropolitan and Regional Audits

The OTR undertakes audits of plumbing installations in both the metropolitan and regional areas of South Australia (refer to Figure A1 W2: Metropolitan on-site plumbing installation audits for the 2021-2022 financial year).

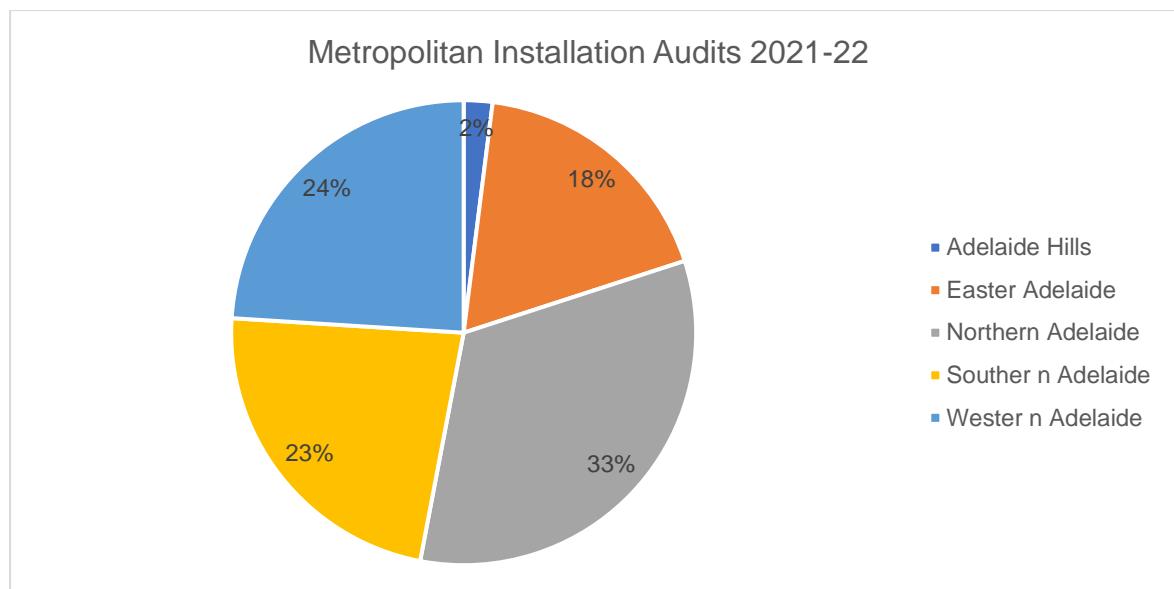


Figure A1 W2: Metropolitan on-site plumbing installation audits for 2021-22

The Technical Regulator has continued to maintain its regulatory presence in regional areas of South Australia via programmed audits of on-site plumbing. In 2021-22, 572 audits were conducted in regional areas of South Australia (refer to Figure A1 W3: Regional on-site plumbing installation audits for the 2021-22 financial year).

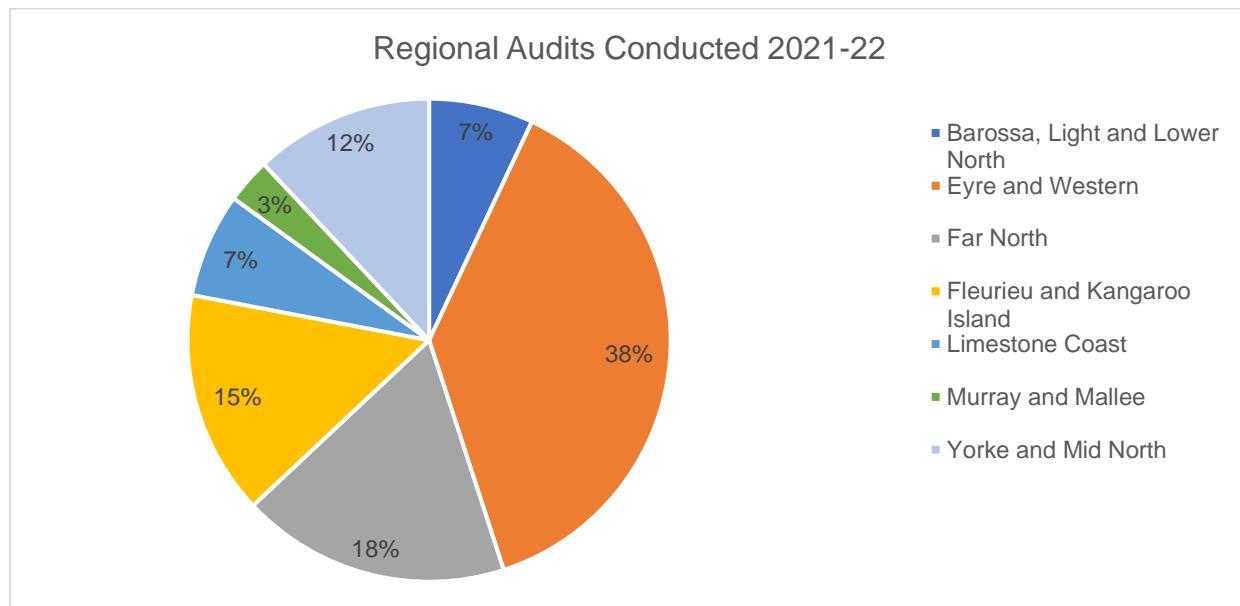


Figure A1 W3: Regional on-site plumbing installation audits for 2021-22

11.3. Fire Fighting and Non-drinking Water Services

The Technical Regulator consults with plumbing practitioners, hydraulic consultants, designers, and industry stakeholders on installations and hydraulic designs relating to inground fire hydrant services, drinking and non-drinking water services.

11.3.1. Fire Service Audits

During 2021-22, 126 fire service audits were carried out. Hydraulic Design Submissions provided by the industry contractors were reviewed to assist the OTR in monitoring and auditing on-site fire service installations and audits of on-site water services.

The Office of the Technical Regulator is not the regulator for fire sprinkler systems, however where fire sprinkler systems are interconnected with a building's drinking water pipework, the OTR undertakes sample audits of these systems to ensure the safety of the drinking water supplies to the building.

The Australian Building Codes Board have referenced a new fire sprinkler system specification into the National Construction Code Volume 3. The new system is the FPAA101D specification. The design and installation of these new systems has been subject to desk top auditing and on-site compliance checking. These types of systems are not yet common throughout the industry but there is an expectation for growth in popularity to occur due to the anticipated industry cost savings this system provides where compared to a conventional fire sprinkler system.

11.3.2. Non-Drinking Water Services Audit

OTR Plumbing Installations Inspectors conducted 369 non-drinking water audits on new residential dwellings, commercial properties and municipal parks plumbed with dual water services (drinking water and non-drinking water services). The trend to use non-drinking water as the primary irrigation supply for municipal parks and gardens remains constant, these public areas are audited to ensure separation of the services and public safety.

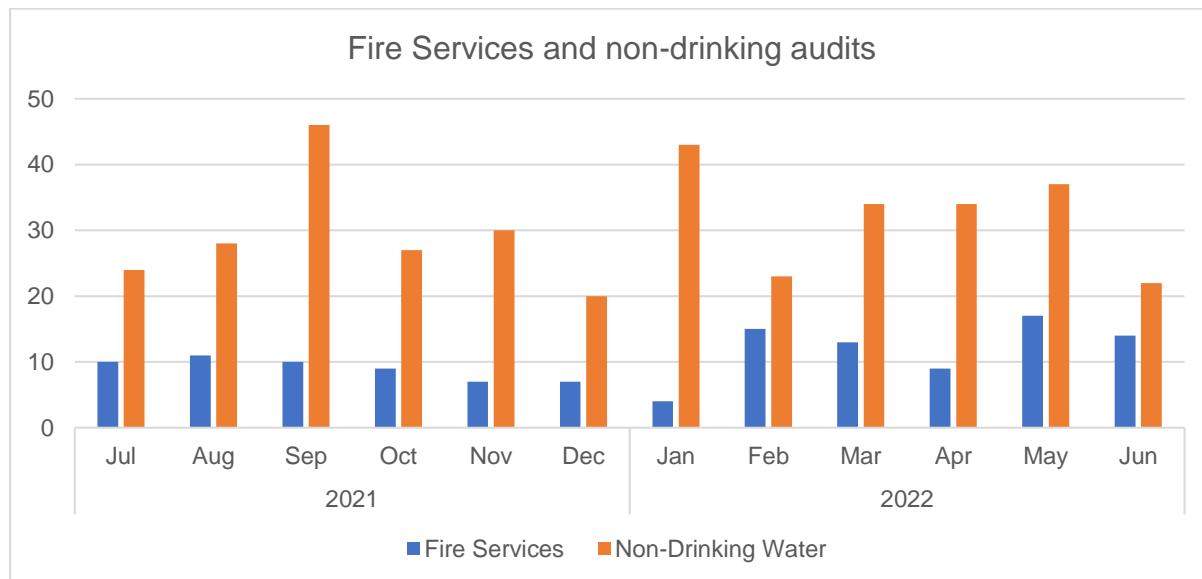


Figure A1 W4: Fire service and non-drinking water audits for 2021-22

11.4. Cross-connection Control and Backflow Prevention

The Technical Regulator audits on-site plumbing water service installations to ensure the safety of the drinking water network and to prevent cross-connections and backflow events. Testable Backflow prevention devices (where required) are connected to residential, commercial, and industrial sites to prevent contaminants entering a properties water service and the entity drinking water infrastructure.

Interactive Water Features (IWF) have become a popular installation in children's play areas. The Office of the Technical Regulator has consulted with SA Health and produced an Industry Advisory Notice to assist in providing advice on the design of the plumbing and equipment installations associated with the interactive water features.

The OTR is working with SA Water to audit a range of metered water services identified on high-risk sites, the audits are to ensure the properties containment backflow prevention devices are compliant.

The Technical Regulator continues to monitor backflow prevention devices installed in on-site plumbing systems. Property owners are obligated under section 69 of the *Water Industry Act 2012* (the Act) to maintain equipment on the customer's side of the connection point.

11.5. Industry Information and Training

The Technical Regulator continues to work in support of the plumbing industry by providing important updates on regulatory matters which include amendments to the National Construction Code Volume 3 (Plumbing Code of Australia) and the AS/NZS 3500 Plumbing and drainage series. The OTR also advises industry on procedural and administrative matters, which ensures that industry has a full understanding of its responsibilities under the Act when designing and installing plumbing and drainage systems.

Seminars and information sessions are conducted both in person and by webinar. The Technical Regulator is chair of the Water Industry Technical Advisory Committee (WITAC) and is represented on the Plumbing Codes Committee (PCC) and the Plumbing Industry Reference Group (PIRG). Information is distributed through the publication of advisory notes, articles for the OTR's Regulation Round Up newsletter and articles prepared for the Master Plumbers Association magazine. The OTR regularly hosts seminars and information sessions which are an effective tool for engaging the plumbing industry by providing valuable feedback when raising and clarifying concerns with regulatory and technical matters.

The Office of the Technical Regulator, in conjunction with the Master Plumbers Association of SA Inc, conducted plumbing industry Roadshows in Mount Gambier, Port Lincoln, Clare, Port Pirie, Port Augusta, Nairne, Tonsley, Ceduna, Wallaroo and Thebarton during 2021-22.

Information sessions were also conducted with TAFE and Peer plumbing students on Fire Hydrant Service, Non-Drinking Water and Backflow Prevention installations. The OTR also provided advice to local council environmental health officers via local government association webinars and face-to-face meetings at local councils.

The Office of the Technical Regulator also conducted plumbing presentations at several plumbing firms during the 2021-22 financial year. Plumbing firms can invite the Technical Regulator to discuss changes to the Plumbing Code and AS/NZS 3500 plumbing and drainage standard series.

This year, the general theme of the roadshows revolved around providing updates on the revision of the AS/NZS 3500:2021 Plumbing and drainage standard series, the Plumbing Code of Australia 2022, and Watermark Certification for plumbing products. The roadshows also refreshed plumbers and stakeholders' knowledge on compliance issues that plumbing inspectors see in the field. Specific topics covered this year included.

- Junctions in drains.
- Backflow Device Hazard Assessment Verification Method.
- Water services in steel framed buildings.
- FPA101D installations.
- Backflow requirements on Hose taps.

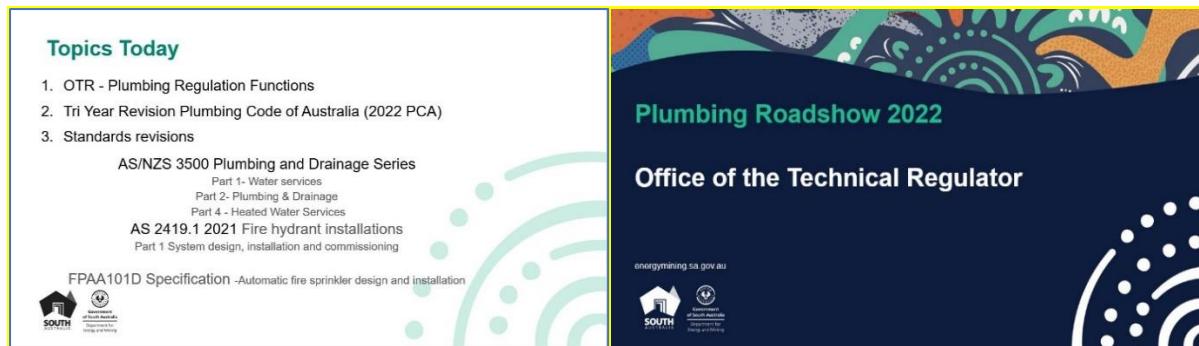


Figure A1 W5: 2021 Roadshow Seminar Topic

11.6. Property Interest Reporting and Data Management

11.6.1. Property Interest Reports

Property Interest Report responses are initiated when a vendor (such as a conveyancer or homeowner) submits a Form 1 Vendors Statement through Land Services SA. If the OTR has a registered interest in the property listed on the Form 1 Vendors Statement, the OTR will respond with details of the interest. The OTR holds an interest in properties that have been identified to have non-compliant plumbing work or backflow prevention device maintenance requirements. This process is usually initiated when a property is being prepared for sale or transfer.

The Technical Regulator processed a total of 1,635 Property Interest Reporting (PIR) requests for the 2021-22 financial year, which is 24% higher than the number received the previous year.

Figure A1 W6 provides the monthly breakdown of PIR requests for 2021-22.

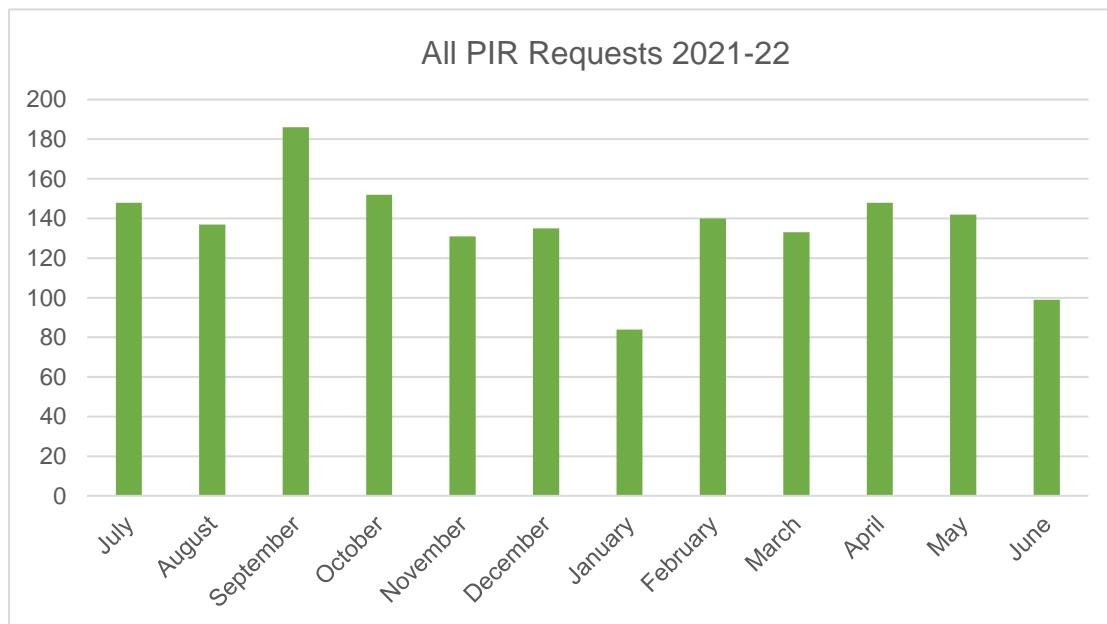


Figure A1 W6: PIR monthly statistics for 2021-22

11.6.2. Data Management

The plumbing section is continuing to improve the data management procedures that are in place to prevent the receipt of unnecessary PIR requests.

This financial year has seen a significant increase in the demand for Property Interest Reports. The data cleansing measures that the OTR has put in place over the previous years has helped to ensure appropriate response wait times even during periods of peak demand. Response from stakeholders regarding these changes has continued to be positive and appreciated.

Section A12: Plumbing Products

12.1. *Plumbing Products certified under the WaterMark Certification Scheme*

The National Construction Code Volume Three – The Plumbing Code of Australia (PCA) sets out the performance requirements and deemed-to-satisfy-solutions for the design and construction of plumbing and drainage systems. The PCA also sets out the requirements for plumbing products used in the construction of a plumbing and drainage installation. Plumbing products are certified and authorised through the application of the WaterMark Certification Scheme.

The Australian Building Codes Board (ABCB) manage the WaterMark Certification Scheme (the Scheme), with the Plumbing Code Committee (which includes State and Territory government and industry representatives) helping in the administration of this 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, with products that have been identified through the risk assessment process as requiring WaterMark Certification 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 Office of the Technical Regulator represents South Australia on plumbing product certification matters.

South Australia as a member of the Plumbing Code Committee assists the ABCB in the development and revision of WaterMark technical specifications and Standards for the plumbing products. The OTR also ensures that WaterMark certified plumbing products installed in South Australia are meeting the requirements of the WaterMark scheme.

Section A13: Regulatory Coordination

13.1. Regulatory Reform - Plumbing Code and Technical Standards

13.1.1. 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 Office of the Technical Regulator represents South Australia on the PCC.

Examples of recent and current work projects undertaken by the PCC include:

- Review of the 2022 National Construction Code.
- Undertaking research and development projects to provide valuable information and input into the development of the Plumbing Code of Australia (PCA). Recent research projects have included Sanitary plumbing and drainage pipe sizing and a project to verify hazard ratings for cross-connection control devices.

Note: The Technical Regulator reviewed the South Australian variations and additions to the National Construction Code 2022.

13.1.2. 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 Office of the Technical Regulator represents South Australia on several working sub-committees that review the AS/NZS 3500 Plumbing and Drainage standard series and other Australian Standards which are referenced under the Plumbing Code of Australia.

The AS/NZS 3500 Plumbing and Drainage Standard series 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 1,2,3 & 4 was published on 28 May 2021. The revised Standard Parts 1,2, 3 & 4 will be referenced under the Plumbing Code of Australia 2022 edition.

13.1.3. Dual Reticulation Infrastructure Standard

The Technical Regulator has published the [Standard for Dual Reticulation Infrastructure \(259.9 KB PDF\)](#). It 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.

The Standard has been published after extensive consultation with stakeholders from the South Australian water industry.

The intent is not for legacy assets to be updated, but that going forward, the design, installation and construction of dual reticulation infrastructure including — up to the point of connection to a property — will be in accordance with the Standard.

This Standard is in addition to requirements set out in the [Water Services Association of Australia \(WSAA\) codes](#).

13.1.4. Infrastructure Standard

The Technical Regulator has published an [Infrastructure Standard](#) which adopts the [Water Services Association of Australia \(WSAA\) codes](#) as the principle minimum Standard for water and sewerage infrastructure.

The intent is not for legacy assets to be updated, but that going forward, WSAA codes, supplementary notices and supporting documents which are equivalent to or exceed WSAA requirements shall be used for any design, installation, inspection, alteration, repair, maintenance, removal, disconnection or decommissioning of water and sewerage infrastructure.

The WSAA codes complement standards, codes and guidelines in current legislation – a copy is available for viewing at the Office of the Technical Regulator.

By formalising the WSAA codes as the Infrastructure Standard, the Office of the Technical Regulator recognises that the WSAA codes have gone through a peer-review process and are widely accepted for the requirements of water and sewerage infrastructure.

If utilities produce supplementary notices and supporting documents which are equivalent to or exceed WSAA requirements, then these will be recognised as suitable as part of this standard.

13.2. Water Industry Technical Advisory Committee (WITAC)

For the period from 1 July 2021 and 30 June 2022, one technical advisory meeting was held on 17 November 2021. Topics covered at the meeting included:

- Dual Reticulation Infrastructure Standard.
- Update on water and sewerage infrastructure.
- Water and Sewerage Infrastructure audit feedback.
- National Performance Report Indicator review update and trials.
- Update on staff changes for water and sewerage infrastructure.
- Plumbing roadshows and industry communication.
- Plumbing regulation report.
- Plumbing Code of Australia projects.
- Continuous professional development.
- Plumbing National Standard/specification reviews.
- Certificates of Compliance Scheme.

Volume IV – Key Performance Indicators

Table K 1: ElectraNet Key Performance Indicators

Performance Indicator	Performance Measured	Definition of Indicator	2018-19	2019-20	2020-21	2021-22
Substation Routine Task Rate	Volume of planned substation maintenance	Number of Substation Routine Tasks completed	5,343	5,910	5,668	6,396
Line Routine Task Rate	Planned line maintenance during the period	Number of Line Routine Tasks completed during the reporting period	1,555	1,790	1,889	839
Substation Corrective Task Rate	Unplanned Substation maintenance during the period	Number of Substation Corrective Tasks completed during the reporting period	6,398	7,768	6,079	6,528
Line Corrective Task Rate	Unplanned Line maintenance during the period	Number of Line Corrective Tasks completed during the reporting period	7,180	7,791	8,609	6,120
Vegetation Infringements	Vegetation maintenance	Number of reported vegetation infringements unresolved within 7 days during the fire season	0	0	0	0
Fire Starts	Line maintenance	Number of fire starts caused by ElectraNet transmission assets.	0	0	3	2
Major Plant Failure Events	Events reported under 73(3)(a) of the Electricity (General) Regulations 2012	Number of failures of major plant requiring replacement (eg. HV transformers, circuit breakers, disconnectors, instrument transformers)	0	0	5	7
Electric Shock Reports	Safety	Number of shock reports	0	1	0	0
Switching Incident Rate	Switching safety	Number of switching incidents per number of switching plans issued	0.45%	0.08%	0.40%	0.37%

Lost Time Injuries	Safety	Number of injuries resulting in more than one day lost	0	0	0	0
Lost Time Injury Frequency Rate	Safety	Number of injuries resulting in more than one day lost per million hours worked	0	0	0	0
Medical Treatment Injuries	Safety	Number of medical treatment injuries	0	0	0	0
Medical Treatment Injury Frequency Rate	Safety	Number of medical treatment injuries per million hours worked	0	0	0	0
Contractor Safety Incidents involving Injury	ElectraNet's contract or safety	Number of reported construction and maintenance contractor safety incidents involving injury	8 (2 LTI & 6 MTI)	7 (2 LTI & 5 MTI)	8 (0 LTI & 8 MTI)	7 (0 LTI & 7 MTI)
Emergency Management Plan Exercises	ElectraNet's emergency response preparedness	Number of completed Emergency Management Plan exercises	6	7	5	4

Table K 2: Some of SA Power Networks Key Performance Indicators

Safety Management Indicators	2018-19	2019-20	2020-21	2021-22
Annual cumulative numbers of lost time accidents involving SA Power Networks personnel (including contractors)	3 Lost Time	8 Lost Time	15 Lost Time	4 Lost Time
Annual cumulative numbers of near misses involving SA Power Networks personnel (including contractors)	1,196 Near Miss	964 Near Miss	1,186 Near Miss	1,012 Near Miss
Hazard logs greater than 30 days old	52	5	67	46
Number of in progress hazard logs	52	15	100	221
Actual workplace inspections carried out per annual inspections planned ¹	1,921 ¹	2,604/2,179	N/A ²	4,938/5,827
Number of shock reports per 1,000 km of mains	5.7	8.5	7.7	8.3
Number of damage claims per 1,000 km of mains	1.5	2.0	2.4	0.4
Number of fire starts per 1,000 km of mains	0.8	0.7	0.6	22
Number of switching incidents	27	27	24	22
Number of completed emergency plan exercises	4	6	5	4
Technical Management Indicators				
% meters within tolerance (per planned sample)	95.37%	96.68%	88.30%	90.5%
General Information				
Number of requests for underground locations provided per year	113,132	118,638	113,485	118,461
Number of revenue metering investigations carried out per year	1,746	1,276	1,451	1,359
Audited compliance against internal vegetation clearance procedures and agreements	Completed by GHD in December 2018	Completed by GHD and OTR in November 2019	Completed by GHD in November 2020	Completed by GHD in November 2021

Note 1: Estimated only by SA Power Networks

Note 2: Access Permits are issued for all Requests for Network Access (RNA) & for ad-hoc requests to cut trees by SA Power Networks engaged tree cutters or to dig near SA Power Networks cables

Table K 3: APA Group's Key Performance Indicators

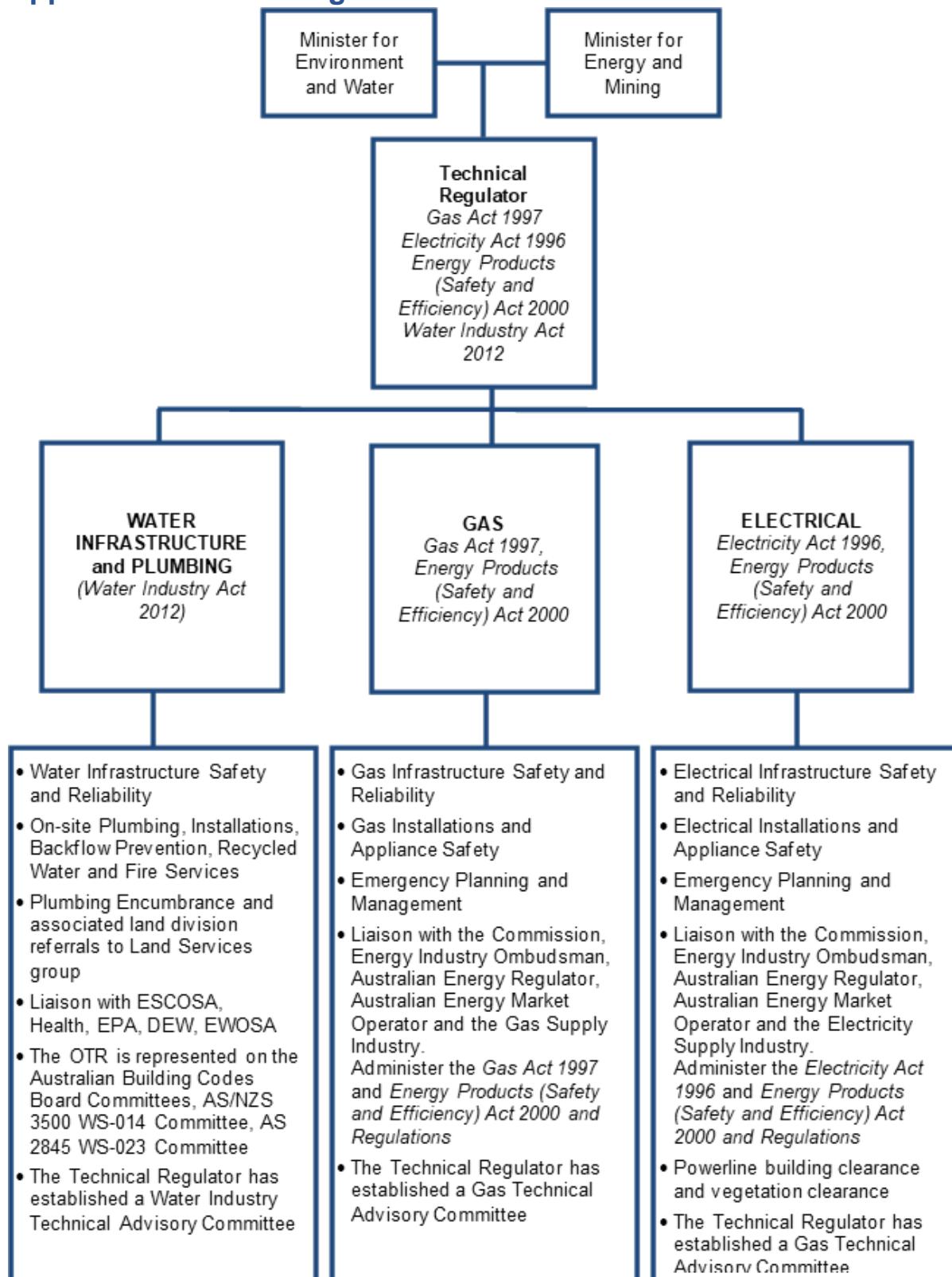
Key Performance Indicators (KPIs) for the distribution networks, as supplied by AGN, owner of the distribution networks in South Australia, and the APA Group, operator of these networks, are as follows:

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	2019-20	2020-21	2021-22
1. Safety			
1.1. The maintenance of continuous, reliable gas supply			
Number of complaints of poor supply pressure	3	4	11
Number of gas outages (>5 consumers affected)	24	20	12
1.2. Instances of third-party damage			
Number of damages to the mains and services, caused by third parties	537	460	475
Number of DBYD locations provided to third parties	97,244	88,785	94,602
1.3. Dealing with potential accidents or unsafe situations			
Emergency plan exercises	5	3	2
Number of evacuations directly attributed to a gas leak from mains or inlet services	4	1	1
Number of instances where a gas leak from a network enters a building	15	6	6
Number of fires or explosions caused by a gas leak from a network	0	1	0
2. Measurement			
2.1. Extent to which meters are being changed over (Gas Measurement Management Plan)			
Number of meters changed:			
Domestic	16,441	17,184	17,627
Industrial/commercial	994	533	646
Number of overdue meters with:			
10 years' life	389	299	405
15 years' life	239	165	117
3. Gas Quality			
3.1. The quantity of gas entering the Distribution System			
Total gas entering the Distribution System (including farm taps) (TJ)	31,850	31,396	31,432
3.2. The maintenance of continuous, reliable gas supply			
Number of poor combustion/poor pressure incidents reported	3	4	11

Number of excursions exceeding one-fifth of the Lower Explosive Limit (LEL)	3	6	9
Number of excursions below 7 mg/m ³ total odorant	16	20	23
Total number of excursions from the gas quality requirements, as specified in AS 4564	0	0	0
4. Reliability			
4.1. Description and specification of Distribution System and its components			
Length of distribution system (km)	8,420	8,498	8,529
4.2. Mains replacement program²			
Total Length of mains replaced (km)	209.4	203.8	152.9
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)	603	437	392
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)	1,600	1,304	1,545
Percentage of publicly reported gas leaks where gas leak was found	87%	85%	80%
Number of leaks detected by Leakage Surveys (per km of surveyed mains)	0.27	0.15	0.15
4.5. Extent of Training			
Percentage of refresher training compliance to scheduled volumes	89%	87%	92%
5. Connections			
5.1. Extent of access to system as required by return			
Number of consumer connections (at 30 June each year)	461,059	466,438	471,662
Number of new connections completed	8,323	8,005	7,433

Appendix 2: OTR Background



Appendix 3: Electronic Certificates of Compliance Form

ELECTRICAL CERTIFICATE OF COMPLIANCE																				
<i>As required by the Electricity Act 1996</i>																				
<p>Certificate Number: E0000000</p> <table border="1"> <tr> <td>Owner/Client name</td> <td colspan="2">Ms Jane Doe</td> </tr> <tr> <td>Installation Address</td> <td colspan="2">1 Doe St, ADELAIDE, SA 5000</td> </tr> <tr> <td>Premises Type</td> <td colspan="2">House/Domestic</td> </tr> <tr> <td>Date of Electrical Work</td> <td>Started: 01/01/2018</td> <td>Finished: 01/01/2018</td> </tr> <tr> <td>Network Operator</td> <td>SAPN</td> <td></td> </tr> </table>			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	Network Operator	SAPN				
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																		
Network Operator	SAPN																			
SECTION A - JOB DETAILS <table border="1"> <thead> <tr> <th>Work Category</th> <th>Work Type</th> <th>Work Performed</th> </tr> </thead> <tbody> <tr> <td>New Install</td> <td>Other</td> <td>Install 2 gang socket outlet to north wall in bedroom 2 on existing RCD protected power circuit P2.</td> </tr> </tbody> </table>			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.												
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.																				
<table border="1"> <tr> <td>Risk Assessment</td> <td colspan="2">None Observed</td> </tr> </table>			Risk Assessment	None Observed																
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> .																				
<table border="1"> <tr> <td>Name</td> <td colspan="2">John Doe</td> </tr> <tr> <td>Licence Number</td> <td colspan="2">PGE0001</td> </tr> <tr> <td>Date Certified</td> <td colspan="2">13/02/2018</td> </tr> </table>			Name	John Doe		Licence Number	PGE0001		Date Certified	13/02/2018										
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.																				
<table border="1"> <tr> <td>Name</td> <td colspan="2">John Doe</td> </tr> <tr> <td>Business Name</td> <td colspan="2">J Doe Electrical</td> </tr> <tr> <td>Licence Number</td> <td colspan="2">PGE0001</td> </tr> <tr> <td>Phone/Mobile</td> <td>0412345678</td> <td>Email ian.furness@sa.gov.au</td> </tr> <tr> <td>Address</td> <td colspan="2">2 Does St, ADELAIDE, SA 5000</td> </tr> <tr> <td>Date Certified</td> <td colspan="2">13/02/2018</td> </tr> </table>			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	
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																			
<p>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.</p>																				
Page: 1 of 2																				
<small>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</small>																				

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 business and consumer licence under section 16 of the Act

Appendix 4: Electrical Products

A4.1. Proclaimed Electrical Products

There are over 604 classes of products proclaimed under the *Energy Products (Safety & Efficiency) Act 2000* for safety purposes. Proclaimed products are also known as Level 3 electrical equipment, and the full list of current regulated Level 3 products can be found on [EESS](#).

Appendix 5 Electrical definitions, formulas and units

A5.1. 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 back-fed from elsewhere in the system as opposed to a 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 lower voltage 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).

A5.2. 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.
-----------------------------	--

A5.3. Performance Indicator Formulae

Planned Outage Factor

$$\frac{\text{MWh out of service due to planned outage} \times 100\%}{\text{Installed plant capacity (MW)} \times 8760 \text{ hours}}$$

Maintenance Outage Factor

$$\frac{\text{MWh out of service due to maintenance outages} \times 100\%}{\text{Installed plant capacity (MW)} \times 8760 \text{ hours}}$$

Equivalent Forced Outage Factor

$$\frac{\text{MWh out of service due to forced outage} \times 100\%}{\text{Installed plant capacity (MW)} \times 8760 \text{ hours}}$$

Equivalent Availability Factor

$$\frac{(\text{Installed plant capacity (MW)} \times 8,760 - \text{MWh losses due to outages}) \times 100\%}{\text{Installed plant capacity (MW)} \times 8760 \text{ hours}}$$

Medical Injury Frequency Rate

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

A5.4. 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

A5.5 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 6: 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 7: 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

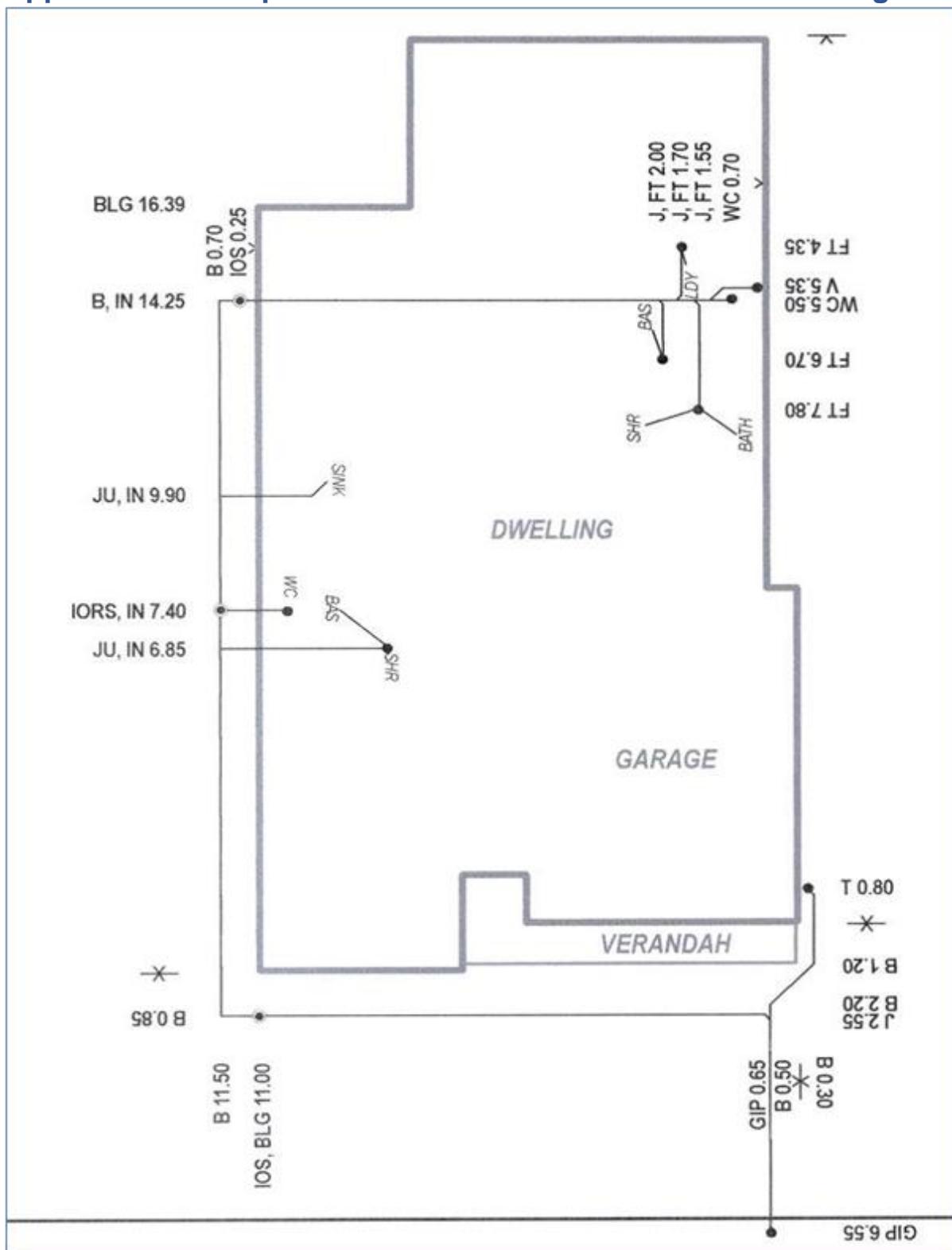
This Scheme may be varied or revoked by the Technical Regulator.

Dated 5 January 2016

R. Faunt

R. FAUNT
TECHNICAL REGULATOR

Appendix 8: Example of internal Drain as Constructed Drawing



Appendix 9: Plumbing Code within the regulatory framework

How the Plumbing Code of Australia fits into the Regulatory Framework

South Australia

Water Industry Act 2012

An Act 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; and for other purposes.

Plumbing Standard

Published by the Technical Regulator pursuant to section 66 of the Water Industry Act 2012

National Construction Code Series Volume 3 Plumbing Code of Australia (PCA)



Referenced Standards: AS/NZS 3500 Series Deemed-to Satisfy Provisions



Government of
South Australia

Appendix 10: Water Industry Entities and licences

Licensee	Licence category	Drinking water	Non-drinking water	Sewerage
Adelaide Hills Council	Intermediate	No	Yes	Yes
Adelaide Plains Council	Minor	No	Yes	Yes
Alano Utilities Pty Ltd	Minor	No	Yes	Yes
Alexandrina Council	Intermediate	No	Yes	Yes
Berri Barmera Council	Intermediate	No	Yes	Yes
BHP Billiton Olympic Dam Corporation Pty Ltd	Minor	Yes	No	No
Cape Jaffa Anchorage Essential Services Pty Ltd	Minor	No	Yes	Yes
City of Onkaparinga - sewerage	Intermediate	No	Yes	Yes
City of Onkaparinga - water	Minor	No	Yes	No
City of Port Adelaide Enfield	Minor	No	Yes	Yes
City of Port Lincoln	Minor	No	Yes	No
City of Salisbury	Intermediate	No	Yes	No
City of Tea Tree Gully	Intermediate	No	Yes	Yes
City of Playford	Minor	No	Yes	No
Clare & Gilbert Valleys Council	Intermediate	No	Yes	Yes
Coorong District Council	Intermediate	No	Yes	Yes
Copper Coast Council	Intermediate	No	Yes	Yes
CPE Tonsley Pty Ltd	Intermediate	No	Yes	No
District Council of Barunga West	Intermediate	No	Yes	Yes
District Council of Ceduna	Intermediate	No	Yes	Yes
District Council of Cleve - Arno Bay	Minor	No	Yes	Yes
District Council of Cleve - Cleve	Minor	No	Yes	Yes
District Council of Coober Pedy	Minor	Yes	Yes	Yes
District Council of Elliston	Minor	Yes	Yes	Yes
District Council of Franklin Harbour	Intermediate	Yes	Yes	Yes
District Council of Grant	Intermediate	No	Yes	Yes
District Council of Karoonda East Murray	Minor	No	Yes	Yes
District Council of Kimba	Minor	No	Yes	Yes
District Council of Lower Eyre Peninsula	Intermediate	No	Yes	Yes

District Council of Mount Barker	Intermediate	No	Yes	Yes
District Council of Mount Remarkable	Intermediate	Yes	Yes	Yes
District Council of Orroroo Carrieton	Minor	No	Yes	Yes
District Council of Peterborough	Intermediate	No	Yes	Yes
District Council of Robe	Intermediate	No	Yes	Yes
District Council of Streaky Bay	Intermediate	No	Yes	Yes
District Council of Tumby Bay	Intermediate	No	Yes	Yes
District Council of Loxton Waikerie	Intermediate	No	Yes	Yes
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 - Hawker	Minor	No	No	Yes
Flinders Ranges Council - Quorn	Minor	No	No	Yes
Kangaroo Island Council	Intermediate	No	Yes	Yes
Kingston District Council	Intermediate	No	Yes	Yes
Light Regional Council	Intermediate	No	Yes	Yes
Lightsview Re-Water Supply Co Pty Ltd	Intermediate	No	Yes	No
Michell Infrastructure Pty Ltd	Minor	No	Yes	No
Mid Murray Council	Intermediate	No	Yes	Yes
Monarto Water Network Ltd	Minor	No	Yes	No
Municipal Council of Roxby Downs	Intermediate	Yes	Yes	Yes
Naracoorte Lucindale Council	Minor	No	No	Yes
Northern Areas Council	Intermediate	No	Yes	Yes
NWIC Pty Ltd	Intermediate	No	Yes	No
Port Augusta City Council	Intermediate	No	Yes	Yes
Port Pirie Regional Council	Intermediate	No	Yes	Yes
Regional Council of Goyder – Burra	Minor	No	Yes	Yes
Regional Council of Goyder – Eudunda	Minor	No	Yes	Yes
Renmark Paringa Council	Intermediate	No	Yes	Yes

Robusto Investments Pty Ltd	Minor	Yes	No	No
Rural City of Murray Bridge	Minor	Yes	Yes	Yes
South Australian Water Corporation (SA Water)	Major	Yes	Yes	Yes
Southern Mallee District Council	Intermediate	No	Yes	Yes
Tatiara District Council	Intermediate	No	Yes	Yes
The Barossa Council	Intermediate	No	Yes	Yes
The City of Charles Sturt	Minor	No	Yes	No
The Corporation of the City of Marion	Minor	No	Yes	No
The Corporation of the City of Whyalla	Minor	Yes	Yes	No
Wakefield Regional Council	Intermediate	No	Yes	Yes
Wattle Range Council	Intermediate	No	Yes	Yes
Wudinna District Council	Minor	No	Yes	Yes
Yorke Peninsula Council	Intermediate	Yes	Yes	Yes

Appendix 11: 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 (formerly known as Envestra Limited) – the 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
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
DIT	Department for Infrastructure and Transport
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 LPG 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 (1,000 Pascals) – unit of pressure
KPI	Key Performance Indicator
LED	Light Emitting Diode
LGA	Local Government Association
LMP	Leakage Management Plan
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LSG	Land Services Group
LV	Low voltage (less than 1,000 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
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 Retail 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	<p>a. Water plumbing work, sanitary plumbing work or draining work on the Customer's side of any connection point.</p> <p>b. Any other work brought within the ambit of this definition by the regulations;</p>
POL connection	'POL' is a type of valve for LPG 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

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