Attachment 9.2

Asset Management Strategy

July 2025

PUBLIC

Australian Gas Networks

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Contents

1 Document Overview

1.1 Purpose

The South Australian Asset Management Strategy (AMS) document provides a high level and long-term view of the safe and efficient installation, operation and management of Australian Gas Networks' (AGN) distribution network. It defines the Asset Management Vision (Section 2) and Objectives (Section 3), explains the Asset Management Framework, Drivers and Processes (Section 3), provides an overview of the gas distribution network assets and summarises the key issues and strategies pertaining to these assets (Section 6 through Section 11).

1.2 Coverage

This AMS covers Australian Gas Networks' (AGN) assets in South Australia, Northern Territory and Mildura managed by the South Australian networks business of APT O&M Services Pty Ltd (APA Group or APA). An overview of the networks covered is shown in Table 1.

Table 1 – Regulatory Coverage of Networks

Regulatory Coverage	Network Entity
Regulated Assets	South Australian metro and regional networks
Unregulated Assets	Mildura and Alice Springs distribution networks, Riverland Pipeline System

1.3 Time Period

This AMS provides a strategic view of the management of assets for the next Access Arrangement Period (AA) from financial year FY27 to FY31. This is the five-year period from 1 July 2026 to 1 July 2031.

1.4 Document Review

The AMS is reviewed and approved at a minimum every five years, with interim reviews undertaken as needed to reflect significant changes or emerging requirements.

An approved copy of the current version of this AMS document is retained in the National Networks Document Library. Communication to relevant internal and external stakeholders, service providers and other relevant parties who require knowledge of this document is via the Intranet publication and standard company briefing processes.

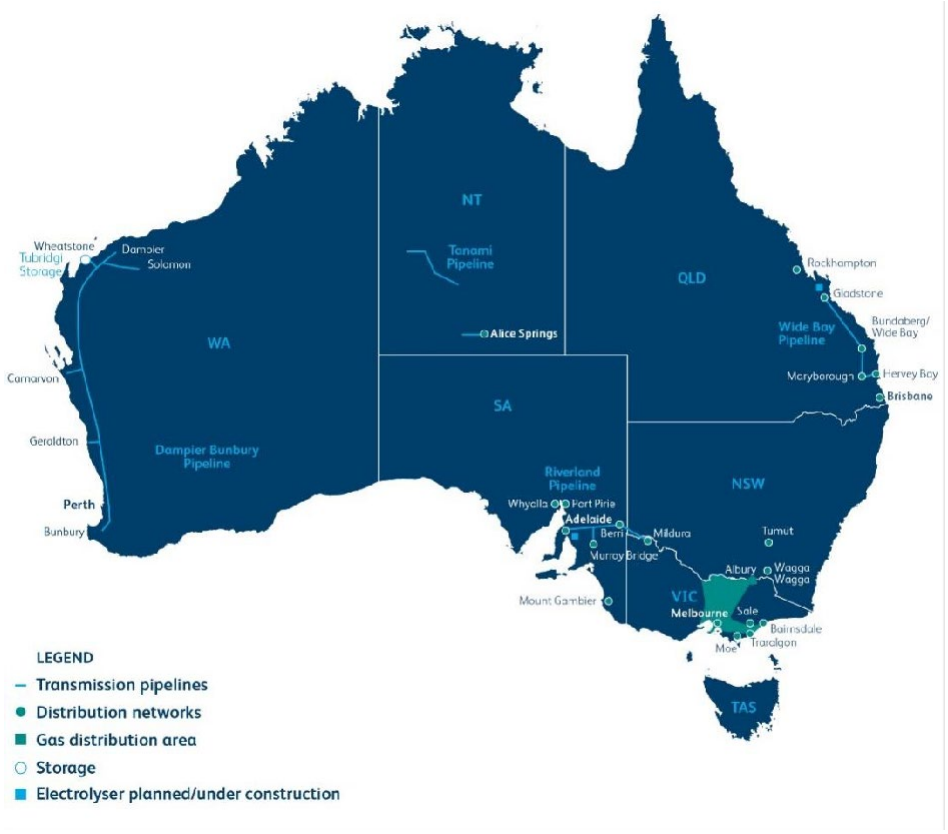
2 Australian Gas Networks (AGN)

2.1 About AGN

AGN is a gas distributor who supplies gas to over 1.3 million residential, commercial and industrial customers across South Australia, Victoria, Queensland (mostly Brisbane) as well as smaller towns in New South Wales (including Albury Gas Company and Southern NSW Networks) and the Northern Territory (Alice Springs). The network includes over 1,300 km of transmission pipelines and 25,000 km of distribution mains.

AGN forms part of Australian Gas Infrastructure Group (AGIG) which is one of the largest gas infrastructure businesses in Australia.

Figure 1 - AGIG Operations



AGN is the holder of the gas transmission and distribution licenses for the natural gas assets. APT Operation & Maintenance Services (referred to in this document as "APA") has been contracted by AGN to install, operate and maintain our gas infrastructure assets. In doing so APA must comply with all applicable laws and authorisations. APA is responsible for all aspects of the operation and management of AGN's networks in accordance with prudent and accepted industry standards.

In South Australia, the regulated AGN network supplies gas to approximately 485,000 end users through a network of more than 8,500 km of distribution mains, and 209 km of transmission pipelines (refer to footprint shown below). Both transmission pressure and distribution pressure systems contain the relevant equipment and systems required for operation such as pressure regulating facilities, corrosion protection systems and SCADA/Telemetry systems.

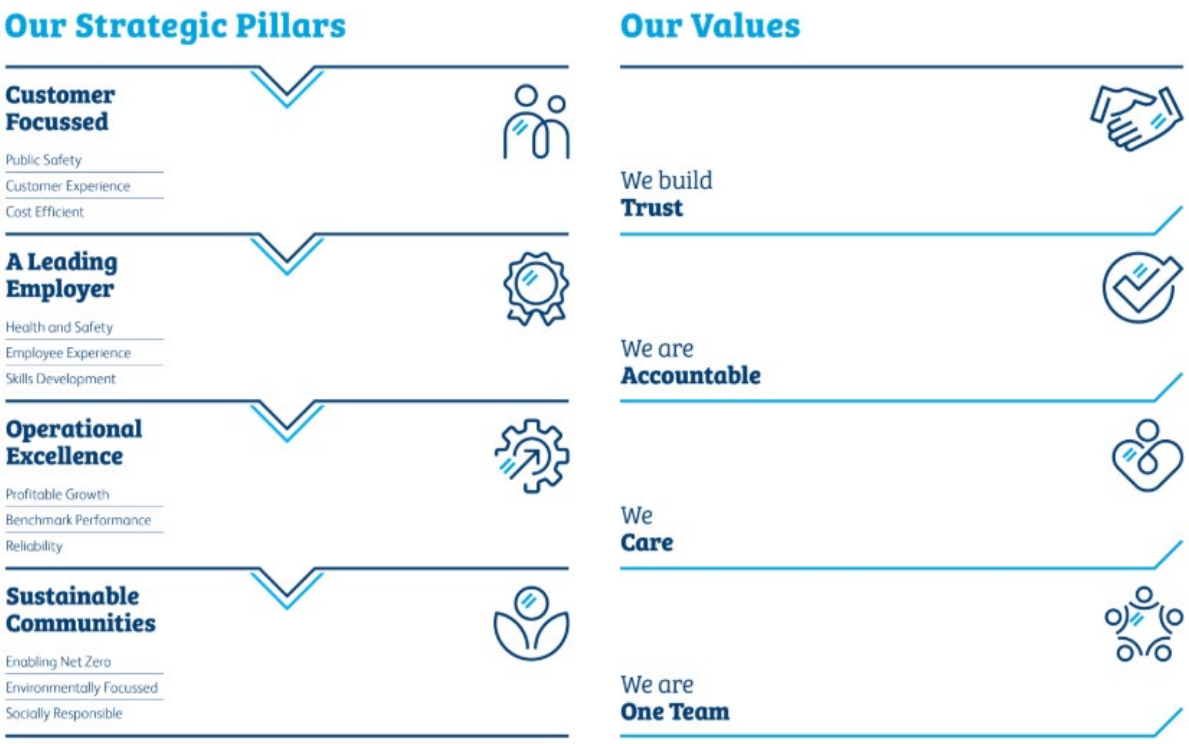
Meter and regulator assemblies, which vary based on consumption profile, can range from large industrial or commercial (I&C) units to small domestic units. An assembly is provided at each supply point to the customer from the distribution network.

The Northern Territory comprises a smaller gas distribution network of around 40km servicing 1,190 customers. In Mildura (Victoria), the distribution network is approximately 300km in size, providing gas to approximately 10,600 customers.

2.2 Vision

From AGIG's vision '**to deliver infrastructure essential to a sustainable energy future'** flows its strategic pillars and core values – together, they define its direction, shape decision-making, and drive meaningful impact.

Figure 1 AGIG Strategic Pillars and Values



2.3 Strategic Pillars & Values

2.3.1 Customer Focussed

As AGN's network is situated in both densely populated and regional areas, AGN strives to maintain public safety through both construction activities and day-to-day operation of the network. AGN aims to continuously reduce the duration and frequency of interruptions to customers and minimise inconveniences from any new connections, meter replacements and any construction activities. This is in line with AGNs objectives of improving reliability and enhancing customer experience.

Costs are a priority for our customers, which is why cost-efficiency is embedded in how we operate, innovate and deliver value.

The value "we build trust" is essential to delivering on our strategic goal of being customer focussed. Trust ensures transparency and accountability, with clear and reliable communication at the core of helping the public feel safe and well-informed.

2.3.2 A Leading Employer

AGN strives to be a leader in health and safety (H&S) by ensuring employees and contractors are mindful of the factors affecting their physical and mental health. This is done through strict H&S procedures, incentive programs and regular workshops and health screenings.

AGN is committed to cultivating an exceptional employee experience – reflected in strong engagement, retention, and a culture of continuous growth.

Skills development is also a priority for AGN ensuring that both contractors and employees have the relevant up to date skills and requirements for fulfilling their roles.

The value "we are accountable" ensures AGN takes ownership of HSE, creating a workplace where people feel protected and valued. The same accountability drives a strong customer experience and ongoing skills development, as AGN commits to delivering on what was promised and investing in its people.

2.3.3 Operational Excellence

AGN strives for operational excellence by upholding high standards of performance across all areas, from field crews to office staff. AGN's focus on efficiency, quality and continuous improvement ensures seamless coordination and long-term success throughout the business.

AGN aims to encourage growth of the network via in-fill development and through the introduction of gas into regional areas – where it is economic to do so.

AGN is committed to ensuring gas reliability through proactive maintenance, efficient processes, and a commitment to consistent, high-quality service delivery.

"We care" is shown through how well AGN run its operations – by growing sustainably, meeting high standard, and being reliable. When we care, we focus on doing things right for our customers, our teams and the future.

2.3.4 Sustainable Communities

AGN is committed to creating lasting postivie impacts on both the environment and society, with its approach to growth and operations rooted in sustainability and responsibility. This includes a carbon net-zero target by 2050 or sooner and championing community engagement through initatives such as local fundraising events, employee volunteer programs, and partnerships with organistation that address community needs in order to contribute meaningfully to the well-being and resilience of the communites it serves.

"We are one team" means we work together to builder stronger, more suistable communities. Together, we take action to reduce our impact on the environement and support the people who live in those communities.

2.4 Key Stakeholders

This AMS is required to address the requirements of key stakeholders that have an interest in the management of AGN's assets in South Australia, Northern Territory and Mildura, Victoria.

Table 2 Key Stakeholders

Organisation or Groups	Role
AGN	Network Owner
APA	Network Operator and Asset Manager
Australian Energy Market Operator (AEMO)	Gas Market operator in South Australia and Victoria.
Office of the Technical Regulator (OTR) Energy Safe Victoria (ESV)	Technical Regulator of the SA (OTR) and Mildura (ESV) network assets
Australian Energy Regulator (AER)	Economic Regulator of the SA and VIC regulated networks
Gas retailers and end users	Users of services provided by the assets
Department for Energy and Mining (DEM) (SA) Department of Energy, Environment and Climate Action (DEECA) (Vic) Department of Mining and Energy (DME) (NT)	Provision, administration of Transmission pipeline licenses in SA, Mildura and NT. Drives planning across precincts, infrastructure priorities, open space, the environment, natural resources - land, water, minerals, energy, and growing industries.
Essential Services Commission of South Australia (ESCOSA) Essential Services Commission of Victoria (ESCV)	Provision, administration and enforcement of energy distribution licenses and oversight of the security and reliability of the SA and Mildura networks.
Energy and Water Ombudsman SA (EWOSA) Energy and Water Ombudsman Victoria (EWOV)	Customer complaint resolution management in SA and Vic.
Industry Partners	Sharing industry information for best work practices
Land Holders	Land owners on pipeline easements

The key asset management requirements of each stakeholder are summarised as follows:

- AGN - as asset owner, requires that APA adopts appropriate asset management practices based on regulatory obligations, accepted industry codes and standards, and that these practices are consistent with those of a prudent and efficient network operator. AGN undertakes to manage the network assets in a safe, efficient and economic manner in partnership with its network operator;

- APA - as day-to-day operator and manager of the network assets, ensures that AGN's requirements as described above are fulfilled. APA is responsible for all aspects of the operation and management of the networks in accordance with the licenses, regulatory requirements and applicable industry standards;
- AEMO – as the market operator, provides market settlement data in the Market Information Bulletin Board (MIBB);
- OTR / ESV – as the technical regulators, they require compliance with legislative and industry standards as they apply to the safe operation of the networks;
- AER - as the economic regulator, requires economically efficient operating costs and provides oversight such that network charges are reflective of prudent capital investment and comply with the National Gas Rules (NGR) and National Energy Retail Rules (NERR);
- Gas retailers and customers – require provision of a safe, secure and reliable supply of gas at a reasonable cost. Cost of supply should include a high level of service delivery and quick response to gas supply problems and associated issues;
- DEM / DEECA / DME – provide provision and administration of the transmission pipeline licenses. Requires alignment and compliance with AS 2885;
- ESCOSA / ESCV regulate AGN's gas distribution operations in SA and Mildura through the provision, administration and enforcement of a licensing regime, which is supported by industry codes that contain SA or Victorian (as applicable) specific requirements that are in addition to the national regulatory framework; and
- EWOSA / EWOV – requires prompt response and resolution to end customer complaints.

2.5 Key Corporate Policies

Table 3 shows the corporate policies of AGN and APA that provide context and inform the asset management vision, objectives, processes and performance requirements of our assets.

Table 3 - Guiding Corporate Policies and Plans

	Policy / Plan	Document Number
AGIG / AGN	Compliance Policy	AGIG-POL-Compliance
	AGIG – HSE Zero HARM Principles	AGIG-POL-HSE-0005
	Health and Safety Policy	AGIG-POL-HSE-0001
	Environment Policy	AGIG-POL-HSE-0002_3
	AGIG – HSE Statement of Commitment	AGIG-POL-HSE-0004

	Policy / Plan	Document Number
APA	Health Safety Environment and Heritage Policy	APA Group Policy – Health, Safety, Environment and Heritage Policy
	HSE Non-Negotiables Policy	APA HSE GP 01.02 T6
	Information and Records Management Policy	APA Information and Records Management Policy
	Procurement Policy	APA Group Policy - Procurement
	Risk Management Policy	APA Group Risk Management Policy
	Networks Emergency Response Management Plan	400-PL-ER-0001
	Engineering and technical policies, procedures and standards	Various

2.6 Operating Licenses

2.6.1 Gas Distribution License – South Australia

AGN's South Australian gas distribution system is as defined in its Gas Distribution License, issued by the ESCOSA under section 19 of the Gas Act 1997. AGN's gas distribution license was originally issued on 16 September 1998 and is amended from time to time.

The license has several key compliance conditions including the obligations to:

- Comply with the requirements under the Gas Act 1997 and the National Gas (South Australia) Act 2008;
- Comply with applicable codes or rules made under the Essential Services Commission Act 2002;
- Prepare, revise and maintain a Safety, Reliability, Maintenance and Technical Management Plans (SRMTMP), and have this approved by the OTR;
- Comply with customer-related standards and procedures; and
- Comply with other applicable codes, standards, rules and guidelines specified by the Commission.

2.6.2 Gas Distribution License – Mildura

AGN's Mildura network is as defined in its Gas Distribution License, issued by the ESCV under section 48E of the Gas Industry Act 1994. AGN's gas distribution license was originally issued on 28 October 1999 and is amended from time to time.

The license has several key compliance conditions including the obligations to:

- Comply with the requirements under the Gas Industry Act 1994;
- Prepare, revise and maintain a Safety Case and have this approved by ESV;
- Comply with customer-related standards and procedures; and
- Comply with other applicable codes, standards, rules and guidelines specified by the Commission.

2.6.3 Transmission Pipeline Licenses

AGN's transmission pipelines, as defined in Appendix, are licensed in accordance with the requirements of the:

- Petroleum and Geothermal Energy Act 2002 in South Australia, administered by Department of Energy and Mining (DEM);
- Pipelines Act 2005 and Pipelines Regulations 2017 in Victoria administered by Department of Energy, Environment and Climate Action (DEECA); and
- Energy Pipelines Act 2015 in the Northern Territory, administered by Department of Mining and Energy (DME).

The individual licenses contain details of pipe location and route, length, diameter, maximum allowable operating pressure (MAOP) and material specifications.

2.7 Network Operations

AGN is the holder of the gas transmission and distribution licenses for the natural gas assets. APT Operation & Maintenance Services (referred to in this document as "APA") has been contracted by AGN to install, operate and maintain their gas infrastructure assets. In doing so APA must comply with all applicable laws and authorisations. APA is responsible for all aspects of the operation and management of AGN's networks in accordance with prudent and accepted industry standards.

APA's operational activities are underpinned by its Health, Safety and Environment (HSE) Policy and Safety Management System "Safeguard", which has been developed to deliver on its HSE commitments, including providing a zero harm work environment.

3 Asset Management at AGN

Asset Management occurs within the context of our Asset Management Framework (AMF), which delivers a consistent, collaborative and integrated approach to the management of the asset lifecycle to achieve optimum outcomes and ensure efficiency across the network.

This AMS has been developed as part of the AMF and provides a summary of the strategies for the main issues pertaining to our gas distribution network assets.

3.1 Asset Management Definition

Asset management is an evolving area of business practice which focusses on the assets (broadly defined) held by an organisation.

The Asset Management Council (Australia) defines asset management as, "The lifecycle management of physical assets to achieve the stated outputs of the enterprise". This definition specifies a focus upon the delivery of a stated capability in which assets play a key role, and in which the business must manage its physical assets commensurate with the business need for that capability. Thus, the definition is concerned with short, medium and long-term considerations from the conception of the asset's need, through its complete operating life, until its disposal phase.

In the AGN context, this means the recognition of the whole lifecycle of all its gas distribution and transmission assets, together with the internal and external factors which influence that lifecycle, and implementation of processes and procedures to:

- Influence and manage asset lifecycles;
- Intervene to prudently and efficiently correct deficiencies; and/or
- Extend asset lives; or
- Replace assets at the end of their lives

3.2 Asset Management Approach

Our asset management approach is to ensure an optimal balancing of capital and recurrent expenditure, so that maintenance, replacement and augmentation of the gas distribution network, delivers the required level of services at the lowest possible life cycle cost. Gas distribution is capital intensive and so except in the case where outputs are mandated, cost benefit analysis needs to be undertaken in order to assess whether the overall economic value of capital expenditure is positive.

As per rule 79 (3) of the National Gas Rules (NGR), in deciding whether the 'overall economic value of capital expenditure is positive', consideration is to be given to economic value directly accruing to the service provider, gas producers, users and end users.

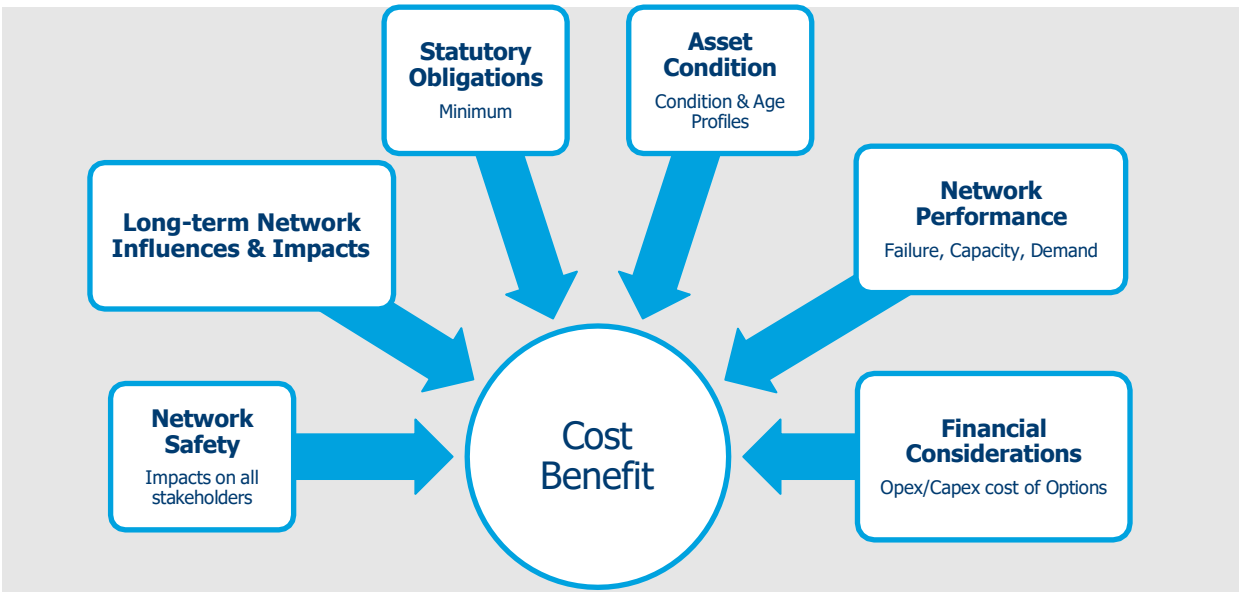
Further to this, consideration is to be given to the 'economic value of changes to Australia's greenhouse gas emissions', either directly or indirectly accruing to the service provider, gas producers, users or end users.

Consistent with this, in assessing the incremental costs we have regard to:

- Direct costs;
- Allocation of capitalised overheads;
- Imposed costs stemming from the program, which accrue to network users and end customers; and
- The economic value of a reduction in greenhouse gas emissions.

Where the delivery of certain outputs is a function of the external obligations placed upon the business (e.g. legislation stipulating network safety requirements), a different approach is undertaken. Often (but not in every case), we adopt a cost effectiveness (least cost) analysis to ensure that where options exist, the output is delivered at least cost. Delivered benefits are a function of the explicit customer value proposition, or proxy via the adoption of minimum performance standards which are stipulated in legislation or other statutory or regulatory instruments.

Figure 4 -Cost Benefit Analysis Drivers



In our asset management approach, 'Delivered Benefits' are dependent upon optimal works execution through:

- Efficient construction, maintenance and operation of network assets in accordance with the asset strategies, asset management plan and budget;
- Ensure effective management of programs (inspections, etc.); and
- Effective capturing, management and diagnosis of asset condition and performance data.

3.3 Asset Management Framework

We have adopted an AMF that delivers a consistent, collaborative and integrated approach to the management of the asset lifecycle to achieve optimum outcomes in an efficient way across AGN and APA.

Asset management is a year-round process with two parallel streams:

- Monitoring asset performance and condition, and implementation of the previous year's asset projects and programs of work; and
- Review of asset issues, quantifying risks, development of technical solutions, budgeting, and securing approvals for proposed programs of work.

The AMS is a key asset management document within this framework. As indicated in Figure 5 below, the AMS is informed by the four (4) asset lifecycle processes. From these processes, the required capital programs needed to achieve the long-term objectives of the various asset classes are derived.

3.3.1 Asset Management Strategy

The Asset Management Strategy and related lifecycle strategies are derived from the Asset Management Policy, as well as key internal and external inputs.

External influences include:

- Regulatory environment - See Section 4 for further details on legislation, technical standards, and regulatory authorities.
- Customer expectations – Include safe delivery of their requirement, no outages and good customer service. See Section 3.8 and Section 5.1 for further details on long term growth planning and performance indicators.
- Commercial appetite – Includes long term vision of networks. See Section 3.6 for further details on asset management drivers.

Internal influences including lifecycle management processes to manage capacity and growth include:

- Performance & Condition Monitoring
- Asset Related failures and incident investigation
- Compliance Evaluation
- System Audit and Improvement actions
- Growth and capacity analyses
- Asset Retirement

3.3.2 Lifecycle Strategies

The Asset Management Strategy forms the basis for the lifecycle strategies applicable to different classes of network assets. The strategies detail the lifecycle management of those specific assets.

The strategies also ensure that projects are justified under AGIG's values and align with our asset management policy and approach. Details of the lifecycle strategies can be found in Section 7 through Section 11.

3.3.3 Asset Management Plan

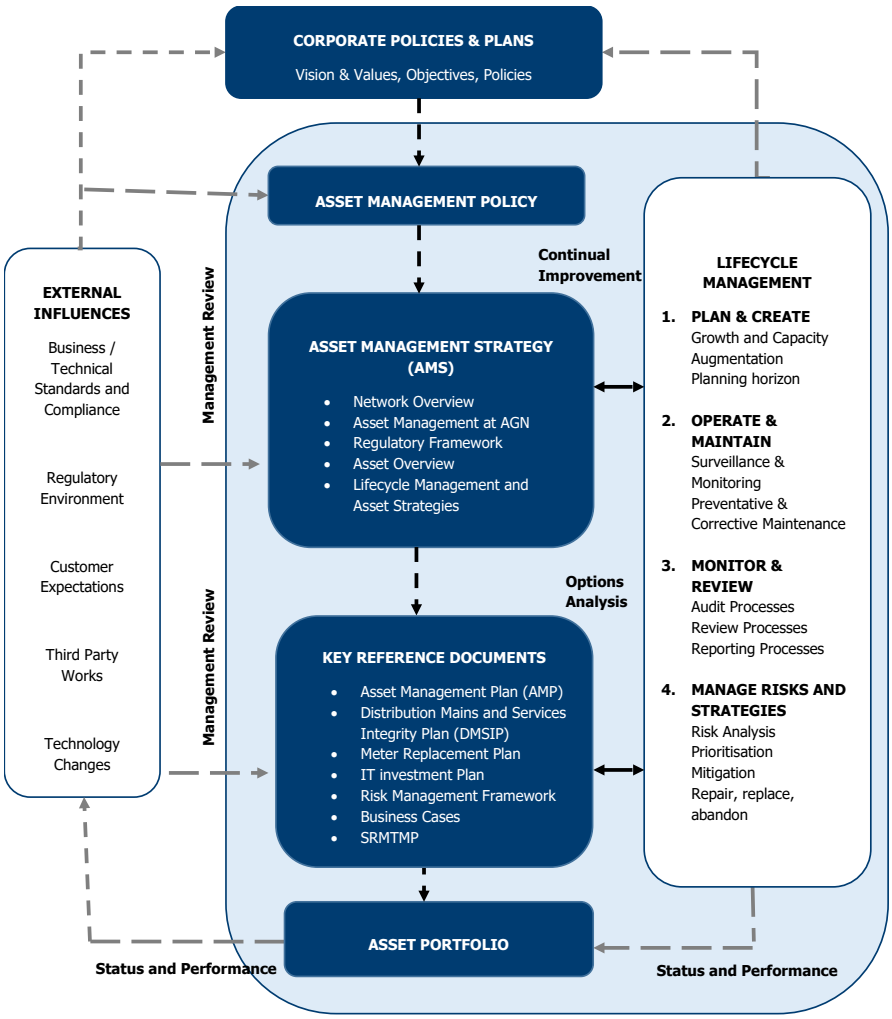
Informed by this AMS and in turn corporate visions, operational performance, business plans and an assessment of the external business environment, the Asset Management Plan (AMP) is central to the delivery of network services to key stakeholders.

The AMP has the following key objectives:

- It defines the linkage between the overarching AMS which contains asset specific lifecycle strategies to business cases at the project or program level; and
- It provides a high-level summary of projects and programs defined within AGN's planned capital expenditure profile for the forecast period of five (5) years.

Refer to the SA AGN Asset Management Plan (FY27-FY31) for further details.

Figure 5 - Asset Management Framework



3.4 Asset Management Policy

The Asset Management Policy supports the efficient and effective delivery of value underpinned by the implementation of the AMF which is utilised to develop strategic initiatives aligned to our vision and values, enabling effective Asset Management of our network assets.

APA, as the asset operator, establishes strategic initiatives that collectively enable Asset Management of our assets to balance risk, cost and performance to deliver maximum long term value.

As part of the Asset Management Policy, we adhere to the following:

a) We maintain appropriate safety protocols at our assets to ensure our people remain safe and our assets operate safely;

b) We take a long term focus on our assets - we will not compromise short term gain for long term detriment of an asset;

c) We balance risk, cost and performance when allocating resourcing;

d) We meet the commitments we make to regulators, employees and stakeholders; and

e) We will not compromise our reputation in making asset decisions.

This Policy and associated AMF are based on ISO 55000 – Asset Management Fundamentals, which are:

f) Value: Assets exist to provide value to the organisation and its stakeholders;

g) Alignment: Asset management translates the organisational objectives into technical and financial decisions, plans and activities;

h) Leadership: Leadership and workplace culture are determinants of realisation of value; and

i) Assurance: Asset management assures that assets will fulfil their required purpose.

3.5 Asset Objectives

We align to six (6) asset objectives which are linked to our vision and underpin our asset management practices. By achieving these objectives, we deliver for our customers, remain a good employer and are sustainably cost efficient.

Table 4 – Asset Objectives

Operate and invest in our assets to keep the public and our employees safe	We will achieve this by: • Investing in and operating our network in line with zero harm principle and all laws and relevant industry standards; • Managing known risks to as low as reasonably practicable (ALARP); and • Meeting emergency response Key Performance Indicators (KPIs) (call centre, high priority leaks).
Maintain continuity of supply to our customers	We will achieve this by: • Meeting network reliability KPIs; • Maintaining operating pressures through monitoring and augmenting our network; and • Addressing leaks in line with our leak management plan.
Improve our customers' service experience in line with their expectations	We will do this by: • Maintaining accuracy of metering assets within relevant industry standards; • Delivering valued services to customers at the lowest sustainable price; and • Meeting customer KPIs (reliability/outages, safety, complaints, and overall customer satisfaction).
Balance network performance and costs to deliver affordable services	We will do this by: • Optimising overall asset lifecycle management costs; • Maintaining operating efficiency without compromising safety and reliability; • Developing investment plans that consider stakeholder expectations; and • Leveraging people, data and technology to deliver continuous improvement.
Promote gas usage to ensure the networks remain sustainable	We will achieve this by: • Connecting new greenfield expansion projects in a timely manner; • Enabling new urban infill connections; • Engaging with key stakeholders to develop adequate network solutions for future supply options; • Increasing long term competitiveness of networks through higher asset utilisation; and • Promoting use of renewable gas.

Embrace innovation and work towards net-zero emissions	We will achieve this by: • Considering alternative innovative, sustainable and/or lower long-term cost solutions in our investment decisions; • Pursuing research and development opportunities where they facilitate us to meet our vision and objectives; and • Supporting the transition to low- and net-zero gas supplies and the move to smarter gas networks.

3.6 Asset Management Drivers

The following several factors shape our Asset Management strategies and practices:

a) **Corporate Policies and Plans**: The corporate policies listed in Section 2.5 provide direction and guidance for the AMF and processes;

b) **Safety**: Ensuring the safety of the workforce and the community is a primary driver for our asset management activities. Our gas distribution network carries the inherent safety risks associated with transporting natural gas. Any leak can pose a safety risk; however, the greatest risk occurs where mains break or crack, releasing gas into (or beneath) a building where it may collect, be ignited and cause an explosion.

Asset management activities are designed to increase the likelihood of leaks being detected and repaired before they can pose a threat to public safety. A key indicator of asset condition can be age. However, asset condition is also heavily dependent on the material, location, and conditions under which the pipe was laid.

SRMTMP: We prepare a SRMTMP as part of our regulatory framework, applied to our SA gas networks. The SRMTMP includes work, health and safety (WHS) issues and matters relating to technical standards, operation, maintenance and emergency procedures and management practices with continuing review and improvement.

The SRMTMP describes how we will comply with the requirements of legislation as well as relevant standards and codes. These standards and codes form the technical framework for ensuring high levels of safety and reliability in the operation of our gas distribution network. It provides a mechanism to compare safety and reliability expectations with actual performance. It also provides an auditable quality approach to safety.

We also prepare a Safety Case for our Victorian networks, inclusive of the Mildura Network. The Safety Case is required under the Gas Safety Act 1997, prepared in line with the Gas Safety Regulations 2018 and is accepted by Energy Safe Victoria (ESV).

c) **Network Growth**: On-going growth drives expansion of the network into new areas and includes additional mains and pressure control facilities to augment network capacity. New connections are made to the network every year giving rise to additional network mains, services and meters. Drivers for new residential connections include population and associated housing growth, interest rates, and building codes for homes. The primary driver for new industrial and commercial connections is delivered energy cost compared to the nearest alternative.

d) **Customer Consumption**: Residential consumption drivers include weather, retail gas price, microeconomic factors, appliance efficiency and alternative energy appliances. Drivers for commercial and industrial consumption include the retail gas price, micro- and macro- economic factors, and appliance efficiency;

e) **Asset Useful Life**: The useful service life of an asset is the period during which it is expected to be usable for the purpose it was acquired/designed. The term applies to:

   i. Actual physical life, where beyond this it is not possible to continue operations, or

   ii. Economic life, where the cost of repair and maintenance becomes greater than the cost of replacement.

Within gas networks, assets such as distribution mains and services have very long useful lives (50-60 years), whereas SCADA assets have shorter lives (5-10 years) due to technology improvements and obsolescence.

f) **Asset Condition**: The overall condition of the asset has a bearing on risks that might be apparent as it ages and degrades over time. For example, as mains age increasing expenditure is necessary to repair an increasing frequency of leaks. There is a point where it is more economically viable to replace a main than it is to continue repairing it.

g) **Security of Supply**: Gas networks are typically a complex series of interconnected pipes that generally provide more than one gas supply path to any customer within the network. Network design for extensions, alterations, augmentation and replacement considers scenarios where a single point of failure could result in significant number of customers losing supply. These scenarios are evaluated based on cost and risk, with additional mains, regulators and surveillance equipment installed where considered appropriate;

h) **Economic Regulatory Frameworks**: The economic regulatory requirements of the NGL and NGR impose obligations on us to incur the expenditure in a prudent and efficient manner as well as in accordance with good industry practice; it also requires that the expenditure must be justifiable;

i) **Technical Regulatory Frameworks**: The installation, operation and maintenance of the distribution network is governed by Australian Standards including AS 4645 for distribution networks and AS 2885 for transmission pipelines. Programs such as the periodic replacement of gas meters is carried out in accordance with the requirements of the South Australian Metering Code and AS/NZS 4944:2006 Gas meters - In-service Compliance Testing.

j) **Third Party Works**: Capital works programs by other utilities, local government, road and rail authorities require that from time to time, gas mains be moved, modified and/or replaced. The cost of such works is recovered from the requesting authority.

k) **Changing Technology**: New technology often brings with it significant improvements in functionality and reduced maintenance costs. However, asset management strategies must also consider the implications for older equipment that may become unsupported and therefore obsolete before the end of their intended service lives. Changes in technology also influence gas demand, where energy efficient technologies and other energy sources such as renewables become more competitive, which often results in a slowing of demand growth.

l) **Achieving Net Zero Networks**: One very significant change being faced by AGN and all gas distribution businesses in Australia is climate change. Australia is party to global imperatives, strategies and agreements which seek to limit the effect of climate change by moving away from fossil fuels, of which natural gas is one, to renewable and less emission intense energy sources. The long-term view is that the use of natural gas may be supplanted by renewable energy sources such as wind and solar and related technologies such as battery storage.

   AGN is knowledgeable and understanding of these major global and local trends, but is also aware that gas distribution systems carry more end-use energy than the electricity distribution networks. To completely supplant natural gas with renewable based electricity will require prohibitively large investments (doubling or more) in the electricity distribution networks.

   As part of AGIG, we have a Net Zero Ambition as set out in our ESG report (refer Attachment 2.1) which aims to reduce the carbon intensity of the gas we transport by replacing natural gas with renewable gas.

We believe we are at the forefront of this strategic shift in industry with our HyP SA, Hyp Gladstone, and Hyp Murray Valley projects, which will inject a blend of natural gas and hydrogen into the South Australia, Queensland, and Victorian / NSW distribution networks.

Conversion of the distribution systems to these types of fuels will have several implications for the management of the network.

m) **Security:** Commonwealth and state governments have imposed legal responsibility on both the owners and operators of critical gas infrastructure and to take all necessary preventative security measures to ensure continuity of supply from safety threats, malicious / criminal threats, and accidents / natural disasters. As a result, there are initiatives to enhance security around SCADA controlled network assets.

n) **Information Management:** Big data analytics is the process of examining large and varied data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences and other useful information that can help organisations make more-informed business and asset decisions.

i. Distribution analytics spans from operational reporting and analytics through planning analysis through to real-time analytics. Each layer provides additional decision-making capability and analysis services required to support and operate the distribution network in future.

ii. The service supply industry, based on smart meters, smart grids, and enhanced customer relationship management systems, is generating massive data sets that utility companies are moving to analyse.

3.7 Lifecycle Management of Assets

We deploy our AMF through four (4) major processes, which reflect the lifecycle of an asset from creation to disposal/abandonment:

1 Plan and Create;

2 Operate and Maintain;

3 Monitor and Review;

4 Manage Risks and Strategies

3.7.1 Plan and Create

Planning and creation considers current and future customer growth and load demands, asset performance and service needs, and secures the necessary approvals for expenditure. It includes the creation of new assets to:

- Extend the mains network (either small extensions to connect new domestic customers or large extensions to service new step-out developments such as new estates or extension to unserviced areas);
- Provide new network, metering and SCADA facilities; and
- Augment the existing assets as capacity limitations are reached due to demand growth.

Planning Horizons

We use a rolling 5 to 10-year plan for assets. Year one (1) of the plan represents firm requirements for the next budget year, while subsequent year forecasts are indicative reflecting forecast connections, growth and utilisation rates, network performance and condition.

- Mains replacement planning is based on an assessment of risk, performance and condition/integrity;
- Mains extension analyses, including extending mains to new estates or major industrial customers, is based on cost-benefit modelling using a planning horizon applicable to each case; and

- Major network augmentation projects are evaluated using a horizon consistent with the reliability of forecast information.

As an example, our risk-based approach has improved efficiency through prioritising the criticality and urgency of the mains replacement program by developing a high density polyethylene (HDPE) inspection and squeeze off clamping program to cost effectively reduce risk and extend the life of vintage HDPE 575 DN40 and DN50 mains.

Key Financial Controls

Network asset creation is subject to the following financial controls, which ensure that creation of assets only occurs in accordance within established prudent approval processes:

1. All domestic mains extensions, Industrial & Commercial (I&C) connections are evaluated using a Net Present Value (NPV) model, while mains replacement projects are evaluated on a risk-based approach;
2. All capital expenditure projects are subject to a formal business case/justification requiring management approval, and in the case of growth projects, a standard financial model;
3. A defined delegation of authority is in place to determine the approval requirements (by either APA or AGN) for all projects; and
4. APA reports to us monthly on progress against capital budget and schedule for major capital projects.

3.7.2 Operate and Maintain (O&M)

Our approach to network operation and maintenance is detailed in the SRMTMP. Operation and Maintenance involves three principal sub-processes:

1. Surveillance & Monitoring.
2. Preventative Maintenance; and
3. Corrective Maintenance.

Maintenance of assets is undertaken to ensure that they continue to fulfil their intended functions (performance levels) within their expected lifetime. Maintenance processes and frequencies consider:

- Asset type, age, history and risk of failure;
- Location and operating environment;
- Manufacturer's recommendations;
- Condition monitoring;
- Australian Standards requirements; and
- Good industry practice.

Operating Manuals, Procedures, Plans and Technical Instructions describe minimum requirements for the maintenance and condition monitoring of network assets. They detail the frequency and scope of work to be carried out and are used in conjunction with relevant codes of practice and equipment manufacturers' instructions.

Operation & Maintenance practices are audited from time to time by external auditors and the OTR. Regional licensed pipelines and networks are regularly audited by APA, AGN, OTR, or external consultancy auditors for compliance with the license conditions and AS2885.3 and AS4645 requirements.

We determine our maintenance activities by introducing incremental refinements to established programs as a result of accumulated knowledge of the asset base. From time to time these schedules are revised to cater for external changes (e.g. new legislation) or reviewed from a zero-base (e.g. application of Reliability Centered Maintenance to maintenance schedules).

Maintenance programs are established to minimise the total lifecycle cost of the asset, taking into account the risk and consequence of failure.

Maintenance activity is forecast to reduce in the next 10 years on a per connection basis because of the targeted capital investment planned for the network, particularly the mains replacement program. This investment will result in a reduced number of leaks and reducing the number of activities associated with visits to regulators.

APA's Maximo Enterprise Asset Management system (EAM) is used to manage the maintenance and inspection regimes for distribution assets. Work orders are issued for the specified work activities and tracked to completion. This tool helps us deliver on our maintenance strategy which is to continue existing maintenance regimes and undertake reactive repair (or replacement) when new issues or risks are identified.

Surveillance and Monitoring

The aim of surveillance is for early detection of an issue or failure, to allow for timely dissemination of information for corrective actions to be undertaken. Monitoring involves the continual analysis of routine measurements (e.g. cathodic protection readings) and observations to detect changes in the environment or status of an asset.

Table 5 below outlines activities undertaken for surveillance and monitoring.

Table 5 – Activities Undertaken for Surveillance and Monitoring

Process	Activities
Surveillance and Monitoring	Telemetry monitoring (pressures, temperatures, alarms)
	Cathodic protection monitoring
	Coating survey, leak survey
	Odorant and gas quality monitoring (National Gas Rules, Part 19 Declared Wholesale Market Rules)
	Pipeline patrol and inspection
	Special crossing inspections
	Camera Inspection of distribution mains
	Inline Inspection (ILI) of transmission mains

Preventative Maintenance

Preventative Maintenance (PM) is planned maintenance that prolongs the lifespan of our assets, and equipment. PM is a systemic approach of maintenance activities that are performed routinely and aimed at reducing and preventing failures. Surveillance and condition monitoring play a key role in identifying the PM activities and frequencies.

Table 6 below outlines activities undertaken for Preventative Maintenance.

Table 6 – Activities Undertaken for Preventative Maintenance

Process	Activities
Preventative Maintenance	Cathodic protection maintenance
	Meter maintenance (I&C)
	Network Facility Installations
	Telemetry System maintenance
	Regulators and Valves maintenance
	Reinforcement at squeeze off points

Corrective Maintenance

Corrective Maintenance (CM) refers to activities undertaken to address and rectify asset failures, defects or performance issues on our assets. Unlike Preventative Maintenance, CM activities can be both planned (e.g. when a known fault is identified during an inspection) or unplanned (when an asset fails unexpectedly, often referred to as breakdown maintenance).

Table 7 below outlines activities undertaken for Corrective Maintenance.

Table 7 – Activities Undertaken for Corrective Maintenance

Process	Activities
Corrective Maintenance	Repairing leaks and third party damage
	Repairing cathodic protection system faults
	Repairing pipe coating failures/faults
	Clearing water ingress and other blockages
	Telemetry system faults
	Fault finding on network facility installations
	Resolving meter problems / failures
	Reinforcement at leaking squeeze off points
	Resolving supply issues

3.7.3 Monitor and Review

All gas distribution assets are continually monitored to review their performance and maintain integrity in line with accepted standards of operation.

Performance aspects include the ability to provide the required capacity to meet customer demands for gas, delivered at required flow rates and pressures.

Assets are monitored to highlight existing and emerging issues related to normal aging over time, accelerated aging or new risk issues.

Operational data is collected on a continuous basis, with programs in place to monitor trends and identify emerging issues. Following risk analysis, new or changed operational procedures are implemented, or capital projects/programs generated.

Audit Processes

Auditing ensures that all activities and processes comply with required industry standards. The results of both internal and external auditing are reported to Management.

Key internal audits include:

- Supervisor monitoring audits - To ensure field activities are performed in accordance with internal requirements and relevant legislation;
- Verification audits - Conducted by trained quality and safety auditors, under a certified ISO 9001 management system, independent to the operating function. The purpose of these audits is to verify that audits of task related activities provide credible and consistent results;
- Technical facility audits - Performed by trained quality and safety auditors under an ISO 9001 management system, since the level of exposure of the business tends to be greater with critical gas facilities. Findings from these audits are reported to Management through detailed reports; and
- HSE Management system audits - provide evidence that the APA HSE system is effective.

These audits are conducted by trained safety auditors and reported to management through reports.

Key external audits include:

- AGN audits - Performed on an "as required" basis to provide confidence that APA is conducting their operational function with due diligence and in compliance with our requirements. The results of these audits are communicated to the APA Management team.
- Regulatory audits - Conducted by regulators as a means of ensuring that activities performed conform to legislative requirements. Audit results form an important input to management improvement processes.
- Safety Plan audits – external auditors may be engaged to conduct audits on particular aspects of safety or operating plans.

Review Processes

Both formal and informal reviews undertaken across the organisation provide valuable input into planning and management processes. The following outline key areas used to assist in planning and management decision making:

- Asset Condition and KPIs - Asset KPIs detailed in Section 5.2 are the primary measures of asset performance, condition and integrity. These are reviewed monthly and reported in the APA monthly operating and management report, as well as the annual Distribution System Performance Review (DSPR).
- Skills and Competencies - Skills and competencies of staff and contractors are viewed as critical in the effective management of the assets. Activities in the business have been assessed for risk, and where ranked as critical, are managed through a robust method of individual certification. Critical activities may only be performed by operators who can demonstrate their competence to nationally registered assessors and have been issued with an 'authorisation to operate'. These critical skills are reassessed every two years to ensure competency is maintained and to provide an opportunity to assess the effectiveness of training.

Reporting Processes

Business reporting is largely hierarchical in nature with the key principal of ensuring that the business is meeting its goals and objectives. Reports are typically classified into four categories: compliance, operational, exception and financial. In general, the vertical reporting structure has the following levels:

- Corporate governance compliance report is a high-level acknowledgement that activities and functions provided by the business conform to all legislative and industry expectations. The report is produced six-monthly for AGN's Board and Risk and Compliance Committee;
- The AGN operational report is produced monthly and draws together key operating criteria, system performance, HSE performance, financial measures, internal and external audits, and other predictive measures into a single, extensive document;
- Departmental reports are produced monthly for the General Manager, APA and provide key operational performance information and HSE performance;
- Section reports are also produced monthly and keep departmental managers informed of the activities under their leadership;
- HSE committee reports are produced by each operating unit to keep all staff informed of the issues that affect their area of operation and management;
- In some situations, the vertical reporting structure is augmented by horizontal reporting methods. Examples of such reporting include hazard alerts, technical bulletins, management presentations, emails and noticeboards;

- Budget planning and monitoring is undertaken to ensure planned work is delivered efficiently and within economic constraints. Detailed budgets are prepared annually and monitored monthly; and
- Regulatory Reporting – The licensed transmission pipelines and distribution networks are included in quarterly and annual regulatory reporting requirements to the OTR in accordance with the Performance Reporting Guidelines (for South Australia), and the Gas Distribution Code. The guideline and Code prescribes various operational reports:
  - Major Interruptions;
  - Statistical Information;
  - Technical Information;
  - Key performance indicators;
  - Unaccounted for Gas (UAFG); and
  - Mains replacement progress.

  The Mildura networks is included in quarterly and annual regulatory reporting requirements to ESV as required by the *Information Specification – Performance Indicators: Requirements for Reporting by Victorian Gas Distribution Companies (January 2009)*

3.7.4 Manage Risks and Strategies

Risk Management

We recognise risk management as an integral part of our operations and strategic planning. Risk management, including risk identification, evaluation, treatment and documentation, is undertaken in a systematic manner to comply with ISO 31000.

There is an inherent risk associated with gas mains and services. Whenever a gas main leaks, cracks, or breaks there is the potential for the community and employees to be seriously injured, or for supply to be disrupted. The risk can vary depending on the location, material type, pressure and age of each gas main or service inlet. We review the performance indicators of mains to assess the potential risk associated with deterioration in condition.

We have n ongoing processes for a. systematic identification, analysis, assessment, treatment, monitoring and communication of all credible risks associated with conveyance of gas across the network; b. regulatory compliance and; c. construction and maintenance activities. Risk assessments are regularly updated to reflect new information on asset conditions, and the consequent risk rating guides the actions and activities that ensure network safety and compliance is maintained as efficiently and effectively as possible.

The risk management process undertaken is in accordance with the APA Risk Management Policy and Risk Management System. All network assets are regularly assessed for a range of identified risks. Following identification mitigations are implemented to reduce the risks in accordance with the risk management policy. This results in projects which are proposed, approved and tracked to completion, or operational activities which are placed into operational and maintenance work management systems.

In addition, all emergencies and incidents are managed under the guidelines outlined in the Emergency Response Management Plan (APA 400-PL-ER-0001).

Strategies

We apply a range of strategies to manage our assets effectively, including augmentation, repair, replacement and abandonment. The chosen approach depends on factors such as asset condition, risk, cost-effectiveness and long-tern network needs.

- **Augmentation**

  Network reinforcements or augmentations are required because of insufficient capacity or redundancy in the network.

- **Repair**

  Repairs to assets are necessary when they fail to perform their intended function. This can be due to part failures, third party damage or age and condition of asset. Component failures typically occur on network facilities and SCADA assets, while repairs are necessary on mains and services as a result of third-party interventions (e.g. damage by Contractor undertaking excavation works) or asset deterioration.

  Repair of leaks on mains and services is one of APA's primary work activities. AGN, APA and the technical regulators in each state closely monitor leak occurrence and repair data, including time to respond to, and repair, reported leaks.

- **Replacement**

  Assets that are approaching the end of their useful service life, or those that experience accelerated deterioration, are identified for replacement. Where feasible (and safe to do so), refurbishment is considered as an option to extend the asset's useful life. The option to replace or refurbish is typically considered as part of the business case process.

  The asset replacement decision is driven by the prudent balance between avoiding future costs of maintenance, current replacement cost, risk, regulatory compliance and levels of service. Where replacement is identified as the prudent option, the asset replacement program considers the efficient allocation of resources.

  In general, useful service life can vary from:

  - 5 to 10 years for SCADA assets, which are particularly sensitive to technical obsolescence;
  - 10 to 20 years for domestic and I&C meters; and
  - 50 to 60 years for distribution mains and services.

- **Abandonment**

  Where an asset has reached the end of its useful life (and cannot be refurbished), it is decommissioned. Like the commissioning process, our decommissioning process is guided by AS/NZS 4645 (for distribution assets) and AS/NZS 2885 (for transmission assets).

3.8 Capacity Management

Network capacity is managed by:

- monitoring network performance;
- assessing forecast demand; and
- assessing threats to supply.

Network capacity issues are addressed according to the risk they present, and undertaken subject to qualitative and quantitative analysis of costs and benefits. The network requires augmentation when:

- the minimum pressure in a network falls, or is forecast to fall, below the recommended minimum end of main pressure during design load conditions; or
- there is insufficient redundancy within the network, which adversely affects the security of supply to a large number of customers.

The capacity management process involves the following activities:

- Maintaining baseline capacity models – Network configurations within the Geospatial Information System (GIS) are exported into capacity modelling software (known as Synergi). Network models are validated against actual field conditions using gate station inputs, large volume customer hourly demand, system pressures and derived domestic, commercial and industrial loads. Computer models are iteratively balanced so that modelled pressures match those from the field;
- Design load assessment – Domestic, commercial and small industrial design loads are derived from the validated baseline network load, corrected to allow for additional consumption consistent with a one-in-two or one-in-twenty probability winter's day. Tariff D customer load is normalised based on variation in consumption during the daily peak hour period throughout winter. In each case the design load is based on a peak hourly load as this is the important parameter for maintaining supply to the network;
- Forecasting load growth – a range of trusted sources, including Planning Authority publications, precinct structure plans, publicly available documentation from "forecast.id" and HIA statistics, as well as internal marketing data, are used to forecast the number and location of new residential connections. Market trend analysis is used to determine the rate of new connections for industrial and commercial, and demand market sectors.

  The additional connections are converted to an expected hourly demand within the network to develop an annual load growth profile that is superimposed on the network model to identify future capacity constraints;
- Network scenario modelling – Synergi is used to evaluate various load scenarios and augmentation options. Capacity shortfalls are identified, and solutions modelled to confirm augmentation requirements;
- Mains replacement planning – the output of the mains replacement planning process is combined with capacity and security of supply issues to optimise the location and size of principal supply mains within the network;
- Project initiation – the various capacity, replacement and security of supply issues are reviewed and options considered. These projects are reviewed annually to confirm their timing and scope.

3.9 Key Documents and Data Sources

The following documents and processes in Table 8 provide information to, or draw information from, this AMS.

Table 8 – Document/ Processes providing information to or from the AMS

Document / Process
SA Asset Management Plan FY27-FY31
Distribution Mains and Services Integrity Plan (SA) (DMSIP)
Meter Replacement Plan (SA)
Safety, Reliability, Maintenance and Technical Management Plans (SRMTMP) (SA)
Pipeline Integrity Management Plan (PIMP)
Pipeline Safety Management Studies (SMS)
Formal Safety Assessment (FSA)
Pipeline Remaining Life Reviews (RLR's)
Gas Distribution License
Transmission Pipeline Licenses

4 Regulatory Frameworks

4.1 Legislation

The primary legislation for compliance of gas networks in South Australia is the Gas Act 1997 (SA) and the National Gas (South Australia) Act 2008. The Gas Act 1997 (SA) regulates the gas supply industry within South Australia, including specifying compliance with appropriate technical Australian Standards, and outlines the functions of the Technical Regulator. The National Gas (South Australia) Act 2008 implement the National Gas Law (NGL) in South Australia by delineating the rules of national regulatory bodies such as the Australian Energy Regulator (AER) and the Australian Energy Market operator (AEMO).

The key legislation we are required to comply with is outlined in Table 9 below.

Table 9 – Key Legislation

State	Legislation	Description
Federal	National Gas Law (NGL)	Regulation of Wholesale and Retail Gas Markets
	National Gas Rules (NGR)	Govern access to natural gas pipeline services and elements of broader natural gas markets Access Arrangement Decisions
	National Energy Retail Rules (NERR)[1]	Govern the sale and supply of energy from retailers and distributors to customers
	National Measurement ACT 1960	Legislation for Australia's measurement system that applies to utility meters
	General Laws	E.g. *Corporations Act 2001*
Victoria	Gas Safety Act 1997	Industry Specific Regulatory Framework Vic
	Gas Safety Regulations 2018	Industry Specific Regulatory Framework Vic
	Gas Industry Act 2001	This Act regulates the Victorian gas industry
	Pipelines Act 2005	Regulatory Framework that applies to transmission pipelines in Victoria
	Pipeline Regulations 2017	Regulatory Framework that applies to transmission pipelines in Victoria
	Essential Service Commission Act 2001	Provides generally for the ESCV's functions and powers
South Australia	Gas Act 1997 (SA)	Industry Specific Regulatory Framework, SA
	Gas Regulations 2012	Industry Specific Regulatory Framework, SA
	National Gas (South Australia) Act 2008	Implements the National Gas Law (NGL) in SA

[1] Only applicable in New South Wales, Queensland, South Australia, Tasmania and the Australian Capital Territory

State	Legislation	Description
	Petroleum and Geothermal Act 2000	Regulatory Framework that applies to transmission pipelines in SA
	Petroleum and Geothermal Energy Regulations 2013	Regulatory Framework that applies to transmission pipelines in SA
	Essential Services Commission Act 2002	General framework for regulated industries in SA
Northern Territory	Energy Pipelines Act 1981	Regulatory Framework that applies to transmission pipelines in NT
	Energy Pipelines Regulations 2001	Regulatory Framework that applies to transmission pipelines in NT
	Dangerous Goods Act 1998	Legislation that sets out the requirements and allowances for licensing, packaging, storage, transportation and use of fuel gas.
	Dangerous Goods Regulations 1985	Legislation that sets out the requirements and allowances for licensing, packaging, storage, transportation and use of fuel gas.

4.2 Technical Standards

Two key sets of Australian Standards referred to by the Gas Act 1997 (SA) that cover the full life cycle operation of AGN's South Australian gas network are:

- AS 2885 Pipelines - Gas and Liquid Petroleum suite of standards as applicable to systems operating at a pressure greater than 1050 kPa; and
- AS/ANZ 4645 Gas Distribution Networks suite of standards as applicable to systems operating up to the 1050 kPa threshold.

AS 2885 and AS/NZS 4645 standards are complimented by several other Australian and international standards. Compliance with both the AS/NZS 4645 and AS 2885 suite of standards is a requirement of the Gas Act 1997 (SA) and subsequent regulations.

We comply with the various Acts, Standards, Codes and regulatory legislation regarding safety, economic, operational, environmental management, and asset security of the distribution networks (as in Table 9 above).

Our Environmental Management System is consistent with expectations detailed within the above and below AS/NZS standards:

- AS/NZS ISO 14001, Environment Management Systems
- AS/NZS 4801, Safety Management Systems

4.3 Regulatory Authorities

The applicable state and national regulator which we work closely with to monitor and discharge our obligations are summarised in Table 10.

Table 10 – Gas Distribution and Transmission Regulators

Regulator	Responsibilities
AER	Economic regulation to ensure compliance with National Gas Law and Rules (NGL; NGR)
	Governing Third Party Access
	Monitors, investigates and enforces compliance with national energy legislation and rules
AEMO	Market and Transmission Systems operator
OTR	Responsible for monitoring gas safety and other technical matters in South Australia
DEM	Administer transmission pipelines legislation in SA
DEECA	Administer transmission pipelines legislation in Vic
DME	Administer transmission pipelines legislation in NT
EWOSA	Responsible for customer complaints and related issues in South Australia
ESCOSA	Industry Licensing requirements (Distribution) Gas Distribution Code and Gas Measurement Code in South Australia
ESCV	Industry Licensing requirements (Distribution) Gas Distribution System Code
ESV	Act as the technical regulator for the Energy Industry in Victoria and oversees the safety of employees, contractors, consumers and the general public. Monitoring and enforcing compliance (with but not limited) to the Gas Safety Act 1997 and the Gas Safety (Safety Case) Regulations 2018.
EWOV	Responsible for customer complaints and related issues in Victoria
WorkSafe NT	Responsible for monitoring gas safety and other technical matters in Northern Territory

5 Asset Performance Summary

5.1 Asset Class Performance Requirements

The following sections describe the general performance requirements for each asset class.

5.1.1 Transmission & Distribution Mains

1 Transmission capacity sufficient to maintain supply during a 1-in-20 year event;

2 Distribution capacity sufficient to maintain supply during a 1-in-2 year event;

3 Gas pressure maintained above recommended minimum values at network extremities.

4 No harm to persons or property due to network failure;

5 Total mains and service leaks reported per km of main reduce over time;

6 The moving annual 12-month UAFG is at a level that is considered acceptable for the characteristics of the network; and

7 The number of third-party damages per km of main is consistent with that of a prudent operator.

5.1.2 Network Facilities

1 Networks do not exceed their MAOP;

2 Supply pressures are reliably controlled to maintain adequate end of mains pressures, above recommended minimums, with no loss of supply; and

3 Cathodic protection systems are operated and maintained in accordance with Cathodic Protection procedure, and pipe to soil potentials maintained within the values required by this procedure and associated Work Instructions.

5.1.3 Metering

1 Metering accuracies are maintained within tolerances specified in the SA Gas Metering Code, the National Measurement Act and AS/NZS 4944: Gas meters - In-service Compliance Testing;

2 Timeframes for installation, upgrading and maintenance are in accordance with the SA Gas Metering Code; and

3 Metering data is supplied within the timeframes specified by the Retail Market Procedures and in accordance with the SA Gas Metering Code.

5.1.4 SCADA Facilities

1 Sufficient monitoring and control are in place to enable efficient planning, monitoring and emergency response; and

2 Demand customer data is accurate, validated (estimated/substituted) and supplied in accordance with the Retail Market Procedures and the applicable gas metering codes.

5.2 Performance Indicators

The following Key Performance Indicators (KPI's) are reported to senior management, while various KPI's are also provided to the technical regulators in each state as required. This includes the number of:

- Poor pressure incidents reported;
- Excursions exceeding 1/5th of Lower Explosive Limit (LEL);
- Excursions below 7 mg/m3 total odorant;
- Excursions outside of gas quality requirements as per AS 4645;
- Instances of third party damages (mains and services);
- Location information provided to third parties;
- Instances where a gas leak from a network enters a building;
- Fires or explosions caused by a gas leak from a network;
- Public reported leaks (mains and inlets);
- Public reported leaks where a gas leak was found;
- Leaks detected by Leakage Surveys (per km of surveyed mains);
- Details of the Mains Replacement Program;
- Evacuations directly attributed to a gas leak from mains or inlet;
- Percentage training compliance;
- Completed emergency response exercises;
- Residential and industrial/commercial gas meters changed and/or with overdue life;
- Customer connections (at 30 June each year); and
- No. of new connections completed.

In addition, AGN and APA regularly monitor the response time to answer calls from the public to reports of gas, the response time to attend gas escapes, the timeliness of repair of gas escapes, and progress of scheduled leak surveys. These KPIs are monitored monthly by senior AGN and APA management.

6 Network Adaptation Strategy – Net Zero Ambition

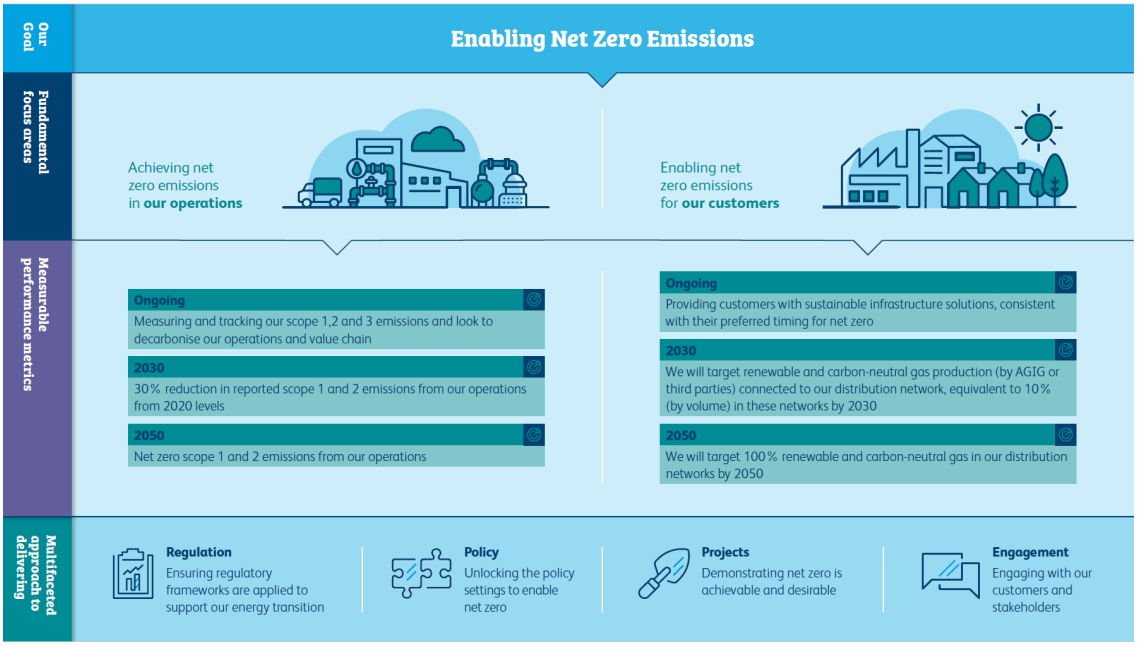
The science of climate change and its impacts on our natural and built environments is well recognised. Addressing climate change requires collective action across value chains. AGIG's Net Zero Ambition is to:

- Achieve net zero emissions in its own operations
- Enable net zero for its customers

AGIG is targeting net zero scope 1 and 2 emissions across all its operations by 2050, with an interim aim to reduce our scope 1 and 2 emissions by 30% from 2020 levels by 2030.

While the energy AGIG delivers is not classified as a scope 1, 2, or 3 emissions, its Net Zero Ambition emphasises going beyond its direct responsibilities to support its customers in their efforts to reduce emissions.

AGIG's Net Zero Ambition aligns with several UN SDG Targets and is detailed in its Sustainability Report.



6.1 Hydrogen Readiness

To prepare for the injection of hydrogen—both at 20% volume blends and for future 100% hydrogen conversion—AGN must update its asset management practices and processes to ensure all assets are hydrogen compatible prior to introduction. Different parts of the network will require tailored modifications depending on whether they are being prepared for a 20% blend or full 100% hydrogen conversion. These modifications include:

6.1.1 Introduction of Hydrogen (blending and/or full conversion)

Replace Incompatible Parts

Hydrogen can cause embrittlement of some metals, leading to a reduction in tolerance to crack-like defects and an acceleration of fatigue failure. We have identified that components with parts made from copper alloys, most aluminium alloys, and stable austenitic stainless steels are suitable for 10% and 100% hydrogen service. Other metals with poor performance such as cast irons, high strength carbon steels (e.g. chrome-moly), martensitic stainless steels and nickel alloys also may not be compatible with hydrogen.

Working with the manufacturers to eliminate as many components as possible, AGN has identified

that there are only 232 incompatible parts within its network that require remediation to allow for the safe introduction of a hydrogen blend. Incompatible components will be addressed under a staggered approach over the coming two AA periods.

Weld procedures and hardness testing

A compatibility review found that most of AGIG's (including AGN) pipelines (>1,050kPa) with design factors below .04 and Network steel piping (<1,050kPa) can safely be used to transport hydrogen blends or pure hydrogen. However, existing weld procedures will not be appropriate and must be re-qualified.

Welding procedures for 28 steel pipelines are required to ensure the safe operation of our steel pipelines. This will include hardness testing for a random sample of welds in each pipeline, to show compliance with the hardness limits of ASME B31.12.

Pipeline repair equipment

Additional work is required to assess compatibility of transmission pipeline repairs undertaken with Plidco & Smith Clamps and purchase compatible equipment. This project will be delivered during in the coming AA period, as the information will assist in developing forward looking upgrade or replacement asset management plans.

Transmission pressure pipeline compatibility assessment

Most of the AGN SA transmission pressure pipelines have already been assessed for hydrogen compatibility as part of the Australian Hydrogen Centre (AHC) technical assessment. Several pipelines were excluded from these scopes due to their complexity, however, they still require suitable assessment prior to the introduction of hydrogen. For AGN SA this impacts one pipeline, which is identified in the table below.

Table 12: Transmission pressure pipelines requiring hydrogen compatibility assessments

Pipeline name / Section Name	Pipeline license	Identified for AA period
Riverland Pipeline	SPL11	Yes

Hazardous areas extents

We must conduct a technical review of 260 Pressure Reduction Sites. This work will require a qualified engineer to review each site and provide recommendations to the business. This activity is prioritized for first two years of the next AA period, as the information will assist in developing forward looking upgrade or replacement asset management plans.

Document updates

We must ensure documentation complies with the introduction and operation of a hydrogen blend. For AGN SA, the following types of documentation have been identified:

- pipeline associated documentation, for example procedure 9066, pipeline defect assessment;
- an updated SMS for each affected pipeline;
- update procedures - AGN LMP for 100% H2 in alignment with the HyP Murray Valley hydrogen pipeline; and
- updates to the Geospatial Information System to indicate blended hydrogen areas.

The project shall be completed within first three years of the next AA period to allow for the continued safe operations the network when hydrogen will be more broadly adopted.

Further assessment or investigation required

Further assessments are required to ensure the safe and progressive introduction and operation of a hydrogen blend into gas networks. For AGN the following areas have been identified as requiring further assessment:

- perform risk assessments on possible loss of isolation for all components containing nickel alloys, any untested aluminium alloy or elastomers;

This activity is phased to align with the 'replace incompatible parts' project to optimise the available workforce. The project increases over the period to balance the overall portfolio of works and to ensure that efficiencies and learnings are applied as the program progresses.

6.1.2 Full Conversion to Hydrogen Networks

Hazardous Area Equipment

Compared to natural gas, hydrogen blends over a threshold of 23.5%vol require a larger minimum hazardous area size in open spaces. Natural Gas with blends of over 23.5% vol hydrogen will require a change to the equipment group, due to the reduced ignition energy compared to natural gas. This solution involves replacing Cat. II A & B rated equipment with Cat. IIC, hydrogen ready equipment.

AGN operates 300 network facilities with hazard areas (such as pressure reduction sites) of which 195 will be target for replacement. AGN also operates 400 metering facilities with hazardous areas (such as interval metering sites). Under our staggered implementation approach, 260 sites will be targeted for upgrade for compatibility with hydrogen during the next AA period.

Further assessment or investigation required

Further assessments are required to ensure the safe and progressive introduction and operation of a hydrogen blend into gas networks. For AGN the following areas have been identified as requiring further assessment:

- review capacity of 260 pressure regulating stations;

This activity is phased to align with the 'replace incompatible parts' project to optimise the available workforce. The project increases over the period to balance the overall portfolio of works and to ensure that efficiencies and learnings are applied as the program progresses.

7 Lifecycle Strategies – Transmission Pipelines (TP)

Lifecycle management details are provided in Section 3.7. General information on transmission pipelines details, specific information on how these assets are managed through their lifecycle, and typical asset strategies are included in this section.

7.1 Asset Description

Transmission pipelines have a maximum allowable operating pressure (MAOP) greater than 1,050 kPa and are covered by Australian Standard AS/NZS 2885.

AGN's transmission pipelines are a primary supply to many of its gas distribution networks and as such are critical to the safe and reliable supply of gas to customers. The consequences of a pipeline failure include potential for serious injuries to the public and loss of supply to large number of customers.

Transmission pipelines are designed, constructed, operated and maintained in accordance with AS/NZS 2885. These pipelines are steel, externally coated and cathodically protected with impressed current or galvanic sacrificial anode systems.

There are 209 km of transmission pressure pipelines in the South Australia AGN Network as indicated in Table 13 below (as of January 2025). The majority of steel transmission pipelines were constructed prior to 1987.

Table 13 – TP Pipelines

Assets	State	Network
Regulated Assets	SA	Metropolitan Transmission Network
Unregulated Assets	SA	Riverland Pipeline System: • Riverland Pipeline • Berri Mildura Pipeline (SA section) • Murray Bridge lateral
	Vic	Berri Mildura Pipeline (Victorian section)
	NT	Palm Valley Pipeline (PVP)

7.2 Plan and Create

Growth of the TP pipeline system is driven by extensions and augmentation to supply residential, industrial and commercial development. Installation of transmission pipelines are not a common occurrence but are added to our asset management profile after they are installed.

There are no TP extensions or augmentations planned for the future, as there is sufficient capacity to handle the growth in the DMS for the next 10 years.

7.3 Operate and Maintain

Transmission pipelines are maintained through a program of inspections and condition monitoring activities as summarised in Table 14.

Table 14 – Transmission Pipelines Inspection and Monitoring Regimes

Maintenance Activity	Frequency
Pipeline patrols	Daily/Weekly/Monthly
Above ground mains inspections	Annually
Cathodic protection (CP) surveys	Monthly (detailed survey every six months)
DVCG coating survey	Every five years (un-piggable pipelines)
Integrity excavations	Condition based
Leak survey (full right of way (ROW))	Every five years Annually for assessed higher risk locations
Inline inspection (pigging)	Every 10-15 years after initial intelligent pig run
External interference management	As required
Remote Telemetry Units and Electrical Equipment Checks	Yearly

Refer to the Networks Pipeline Integrity Management Plans (PIMP) for further details on the operation and maintenance programs on the TP assets.

7.4 Monitor and Review

The integrity of AGN's transmission pipelines is assessed and managed through a system of five yearly location class and safety management studies (SMS), five yearly DCVG coating surveys, ten yearly fitness for purpose reviews (FFP), and annual capacity performance reviews.

Location Class Reviews

Specify the type and nature of land use adjacent to the pipeline route. For an operating pipeline the location class will be affected by change in land use and / or encroachment. It is conducted as part of the SMS review and complies with the requirements of AS 2885 part 6. A review of the class location is also conducted on a maximum 5 yearly interval and immediately after the following threats are identified:

- External threat and encroachment;
- New development or subdivision approval request;
- New infrastructure encroachment; and
- Identification of new or modified land use.

Safety Management Studies

In SMS's, pipeline threats are identified and the associated risks are assessed. This is the primary document around which all pipeline operation and management activities are based.

Fitness For Purpose Reviews

The outcome of the FFP will determine any actions and / or recommendations ensuring the pipelines and their facilities are fit for continued service, practices and that processes are in place to enable pipeline and facility operation at least for the next ten years.

Capacity Performance Reviews

Refer to Section 3.8 for more details on capacity reviews performed on transmission pipelines.

7.5 Risks and Strategies

Common risks and issues for transmission pipelines are mentioned below.

- External Corrosion
- Ageing above and below ground coating
- River and creek crossing washouts
- Depth of cover management
- Third party damage causing dents or gouges
- Unpiggable pipelines
- Capacity constraints
- Material/ weld defects
- Faulty valves

The normal process of assessing and prioritising risks, as outlined in Section 3.7.4, leads to the development of projects and work programs during the annual capital budgeting and five-yearly AA processes. This involves creating asset strategies that are specifically tailored to Transmission Pipeline issues.

These asset strategies form a key part of asset life cycle optimisation. They include further detailed assessment of the identified risks or issues, followed by the formulation of mitigation strategies designed to manage and reduce those risks effectively. Through this approach, the long-term performance and reliability of transmission pipelines are maintained, ensuring optimal use and extension of asset life.

Below is some background and description of these asset strategies as they relate specifically to transmission pipelines.

7.5.1 Capacity Related Strategies

7.5.1.1 Reinforce or Augment Transmission Networks

Transmission pressure pipelines (TP) are the primary supply to high and medium pressure networks supplying consumers.

Continuing growth in some areas has the potential to reduce the pipeline pressure below the recommended minimum. It is essential to maintain a safe and reliable supply to customers. Operating below the recommended minimum pressure could result in the loss of thousands of customers.

Our strategy is to review augmentation alternatives to reinforce pressures in the networks on a yearly basis. This is to be done in a prudent manner, where we "sweat the assets" as much as practicably possible. Alternatives are evaluated based on cost and risk to ensure the solutions are optimised.

7.5.2 Integrity Related Strategies

7.5.2.1 Routine Maintenance and Condition Activities on Pipelines

It is important to be able to understand the threats on each pipeline and to be able to locate and repair them to optimise their life expectancy by preventing pipeline failure and maintaining safe and reliable operation. These threats are being managed through various routine programs including indirect and direct assessments, coating and CP potential surveys. These programs can also involve excavations and non-destructive examinations, coating and pipeline repairs, and other routine maintenance and repair activities.

"Some of the biggest threats to pipeline safety are unauthorized construction, development, encroachment and digging activities" - external interference - which could result in third party damage to the pipelines. The risk is managed through a combination of measures including pipeline patrols, special zone surveys, before-you-dig-Australia services (BYDA), and strict adherence to encroachment and construction guidelines.

In addition, depth of cover management plays a critical role in mitigating these threats by ensuring pipelines maintain adequate soil cover to protect against mechanical damage. Regular assessments and maintenance activities are carried out to monitor and address any areas where the depth of cover may be compromised, further safeguarding pipeline integrity.

7.5.2.2 Pigging of Pipelines

Most of our TP pipelines were constructed prior to 1987, with two of the pipelines (M42 and M12) being over 55 years old. Two of the greatest risks associated with these steel pipelines are corrosion and third-party interference, which can result in metal loss which weakens the pipeline leading to failure.

Inline inspection is industry best practice for detecting, locating, and sizing defects in pipelines. This enables proactive and targeted repairs of defects that pose a risk of pipeline failure, helping to maintain safety and integrity. A semi quantitative risk-based priority ranking methodology has been developed to prioritize the order in which each pipeline should be inline inspected. The methodology estimates the remaining life of each pipeline, using its age, coating type, threat of known corrosion mechanisms and CP performance. This is combined with the impact of supply should the pipeline fail.

Each pipeline will undergo a desk top feasibility study followed by in field feature assessments to determine the pipelines piggability. These studies and assessments determine whether any modifications are required to make the pipeline piggable. Modification examples include replacement of main line valves, installation of launching and receiving facilities and replacement of pipeline sections to standardize the pipeline diameters. Once any necessary modifications are made, the pipeline is fed into the inline inspection program.

There are 36 sections, or 146km of TP pipelines that are not piggable in South Australia. The plan is to continue to modify these pipelines to make them piggable where feasible and perform inline inspection.

7.5.2.3 DCVG and Pipeline Dig Ups

Steel TP pipelines can be prone to corrosion, which if left untreated can lead to pipeline integrity failure and a major uncontrolled gas escape. The consequences of a major uncontrolled gas escape can be severe, as metropolitan TP pipelines are typically located in or near developed areas and major population centers.

To help mitigate the corrosion risk, one of the methods we use to manage corrosion is to conduct direct current voltage gradient (DCVG) surveys, which detect faults in pipeline coatings. The DCVG surveys are followed by direct inspection excavations (or 'dig ups') of areas where DCVG indicates the pipeline coating has failed.

All South Australian TP pipelines are surveyed via DCVG every 5 years. Pipeline locations with IR readings greater than 15%, or where coating defects have been observed to have grown are

prioritized for dig up and repair.

Field validation suggests that there is still a high chance of coating defects or corrosion being found at IR levels of less than 15%. Hence, the strategy is to excavate, examine (and repair where necessary) sites with multiple indications even when the IR reading is less than 15%, as DCVG is currently the primary inspection technique.

Sites will still be prioritised with high priority (greater than 15% IR) identified through the DCVG process to be excavated first, followed by the sites with less than 15% IR.

7.5.2.4 Heat Shrink Sleeves

Within the South Australian network there is approximately 130km of TP pipeline systems built using Heat Shrink Sleeves (HSS).

HSS is a method for coating the field joints between pipe segments where the factory applied coating to the pipe was not applied or was removed for welding purposes. HSS have not proven as effective or easy to achieve a quality application as initially designed, leading to coating disbondment, causing CP shielding and general or pitting corrosion.

The lack of CP penetration also limits the ability of DCVG surveys to detect corrosion related to HSS. Industry practice is to use in line inspection (ILI) tools to demonstrate pipeline integrity. ILI (or pigging) is effective at detecting the wall loss from corrosion under HSS.

In the absence of ILI, the current approach to managing HSS involves starting with a DCVG survey followed by targeted excavation. When HSS is identified as a threat on a pipeline, the excavation is extended in both directions from the DCVG indication to the nearest field weld. The affected HSS area is then exposed, the steel condition inspected, and any necessary mechanical repairs are carried out before recoating with a modern coating system.

If advanced corrosion under the HSS is found, the excavation is further extended by one pipe length in either direction, with potholing to locate the field weld(s), followed by additional remediation actions as required.

The plan is to continue this dig up, inspection and remediation program for HSS. Pipelines scheduled for conversion to ILI conversion have been excluded from the scope of work.

8 Lifecycle Strategies – Distribution Mains and Services (DMS)

8.1 Asset Description

AGN South Australian distribution networks (including Mildura and Alice Springs) consists of over 8,700 km of mains and approximately 498,000 services operating at pressures from 1.7 kPa to 1050 kPa. These mains and services form the distribution network that deliver gas to residential, commercial and industrial customers.

Distribution trunk mains operating at high and medium pressure tiers form the backbone of the distribution network, feeding smaller mains and more local areas. The consequences of a failure of these trunk mains include potential for serious injuries to the public and/or loss of supply to several hundreds to several thousands of customers.

The installed distribution mains in the SA and Mildura AGN Networks are summarised in Tables 15 - 16. This data covers the mains installed up to January 2025.

Table 15 – AGN South Australian Natural Gas Networks (excluding Mildura), Installed Distribution Mains (km)

	Cast Iron	UPS	Steel (Protected)	HDPE 250	Copper	HDPE PE 500/575	MDPE PE 80	HDPE PE 100	Total
Low	21	3.3	9.1	61.1	0.1	18.3	18.3	27.5	153.7
Medium	0.5	3.2	481.1	2.3	1.0	540.1	1385	703.7	3127
High	-	-	1133.5	-	0.2	390.8	1930	1775.7	5230.2
Total	21.5	6.5	1623.7	63.4	1.3	954.2	3333	2507	8510.8

Table 16 – AGN Mildura, Installed Distribution Mains (km)

	Cast Iron	UPS	Steel (Protected)	PVC	HDPE PE 500/575	MDPE PE 80	HDPE PE 100	Total
Low	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-
High	-	-	32.9	-	-	222.6	44.0	299.5
Total	-	-	32.9	-	-	222.6	44.0	299.5

Services comprise the service pipe and fittings with transition from the buried service to the above ground meter via a metallic service upstand, on which an isolation valve is installed so that supply can be shut off in an emergency.

Services generally consist of material of the same vintage as the gas main to which they are connected, as they are generally laid together as one project. That is, when cast iron mains were laid, galvanised steel services would have been laid at the same time (and when such mains were replaced with Polyethylene (PE), the associated services were renewed with PE). It is generally assumed that services have the same age as the main to which they are connected.

Multi User sites (MUS) are a combination of services connected to a sub main or trunk service feeding multiple units/houses within the same property. These are typically located at subdivided properties, aged care homes and government housing.

8.2 Plan and Create

Capacity and engineering assessments are done to maintain a safe and reliable supply of gas to customers while balancing cost effectiveness. The core objectives are as follows:

- To maintain capacity in the distribution networks;
- To forecast load growth and other drivers for network augmentation and
- To determine timing and budget estimates of augmentation projects required to consumers.

Refer to Section 3.8 for more details on capacity reviews performed on distribution networks.

There is approximately 50 km of mostly HDPE PE100 mains added to South Australian AGN Networks each year and along with 7,000 new services. The two large growth corridors include the northern corridor around Angle Vale and Gawler, and the Southern corridor around Seaford Aldinga. These two growth corridors are experiencing high growth levels, and this trend is forecast to continue for the next 5 to 10 years as more land is developed and the fringes continue to expand.

Growth in Regional SA and Mildura has slowed with approximately 6km of new mains and 400 new services added each year.

Lastly, the speed of the energy transition and the impacts on networks and augmentation is largely unknown. This could come in the form of augmentations required to connect biogas plants and ensure reliable injection capacities and/or the impact of hydrogen blending, which may bring forward augmentation due to the lower heating value and higher flow rates required for end users. Combined with high levels of current growth and uncertainty of energy policies, the next five to fifteen years will be a very exciting time in the gas distribution space.

8.3 Operate and Maintain

Key mains and services operation and maintenance activities are detailed in Table 17.

Table 17 – Distribution Mains Maintenance Activities

Maintenance Activity	Frequency/Target
Gas supply investigations	Proactive checks as a result of network monitoring activities and follow up checks to public reported leaks.
Planned Leak Survey	A rolling 5-year survey of all mains with 6 month and 12-month special surveys of ‘high’ risk areas. Target is to undertake 100% of planned surveys each year.
Cathodic protection potential checks	Every six months
Winter Pressure Surveys	Annually

8.4 Monitor and Review

8.4.1 Formal Safety Assessments (FSA)

Formal Safety Assessments (FSAs) are conducted to cover design, construction, commissioning, and the operation and maintenance life cycle phases. They are carried out on all distribution assets as follows:

- Identify hazards
- Identify threats/trigger events that could lead to the hazards
- Document existing prevention, mitigation, and/or control measures which would prevent the hazards resulting in the identified hazardous event consequences (collectively: controls)
- Evaluate the overall risk of the incidents when all preventative and mitigation measures are considered ie the effectiveness of the controls
- Evaluate the potential consequences of each type of gas safety incident
- Determine, based on the category of risk and the control measures in place, whether the risks for each scenario have been reduced as low as reasonably practical
- Recommend additional measures/layers of protection if appropriate

8.4.2 Distribution Mains and Services Integrity Plan (DMSIP)

The DMSIP documents the process and results around managing the condition and integrity of the Network's distribution mains and services and monitors / reports progress against regulatory benchmarks.

Network performance and integrity is reviewed annually. Key indicators used to assess the integrity of the network through trends:

1. Mains and service leaks;
2. Gas in building (GIB) incidents;
3. Supply outages; and
4. UAFG

8.5 Risks and Strategies

Below are the distribution mains and services risks and strategies that relate to AGN SA Networks' capacity, mains replacement and other integrity management programs.

8.5.1 Capacity Related Strategies

As part of the monitor and review strategy, network capacities are assessed yearly. The assessment factors in peak winter flows, network pressures, historic growth levels and forecast growth rates (including Precinct Structure Plans). Networks that are modelled to have pressures fall below 90 kPa during the next AA period FY26 to FY31, are flagged for augmentation. A threshold of 90kPa is the minimum level necessary to maintain a safe and reliable customer supply set.

8.5.1.1 Augmentation

On average, historically there has been 2 major new augmentation projects (one in the southern growth region and one in the northern) required per five year AA period to strengthen the network, which is forecast to continue for the next AA period FY26 to FY31.

8.5.2 Integrity Related Strategies

8.5.2.1 Vintage HDPE 575

There are over 240 km of unclamped vintage HDPE Class 575 mains remaining in the South Australian network. These mains were installed from late 1970s to the mid-1990s. This early grade of polyethylene (PE) did not contain any of the additives that the newer PE 80 and PE 100 grades contain, which make these mains more susceptible to slow crack growth (SCG). SCG initiates from damage inflicted by Squeeze Offs (SQO) and/or other stress concentrators. For HDPE 575, the performance has historically improved post 1993 due to improvements in the squeeze of practices (introducing of stops) and specified release rates, however as the mains age, the number of leaks has been increasing.

There is 120km of post 1993 DN40 HDPE 575 High Pressure (HP) and 119km of DN40 HDPE 575 Medium Pressure (MP). The plan is to inspect and clamp all pre 1993 mains and the post 1993 mains with historic SQO leaks.

Additionally, there is a AGN South Australian sampling and testing program of the reinforcement clamps on vintage HDPE 575. Samples of previously clamped repairs will be removed from the AGN network and submitted for testing.

8.5.2.2 Protected Steel

Protected steel mains in distribution networks are challenging to cathodically protect due to the increased electrical resistance with the smaller cross-sectional area and interruption of the insulating coating including at service connections and tees. Anodes and other CP assets have a reduced "radius of protection", as protective potentials are not able to propagate through the network as effectively.

There are more than 1,600 km of steel mains throughout the South Australian networks. The overall risk of this asset class escalates with time due to their age and increasing leak rates. Some of the protected steel mains are approaching 60 years and recent inspections indicated signs of deterioration. These steel mains are still cathodically protected, however, cathodic protection becomes ineffective as the pipeline integrity deteriorates with age. These factors combined show that the integrity overall of protected steel is declining and leak rates are increasing.

The plan for the next AA period is to replace a small number of the poorest condition/riskiest protected steel mains and assess the condition of the removed mains. This will support the development of a long-term strategy for steel mains in the distribution network.

8.5.2.3 Multi-User Sites

Multi-User Sites (MUS) are services running through unit development and commercial premises that supply gas to multiple users. There are approximately 1,280 MUS remaining (excluding priority 3) located across our network. Services can be steel or PE depending on when they were installed.

High risk Priority 1 MUS have been renewed, including the completion of a physical infield survey on all identified sites supplied to update the prioritisation of the future MUS program. This survey work confirmed that the risk-based approach applied in the current AA period remains valid and will be continued into the next AA period.

We have an ongoing program of surveying each MUS and categorising them by priority, as follows:

- Priority 1 – Replacement required as soon as practical due to failure, significant non-compliance or a location of specific concern.
- Priority 2A – Assets that are generally compliant but are ageing and will require replacement as they approach the end of their useful life.
- Priority 2B – Assets that are visually compliant but are ageing and will require replacement as they approach the end of their useful life.
- Priority 3 – Assets installed using newer PE materials, meter locations are compliant, or

the dwellings within the MUS site are supplied with individual service connections direct to the main (as opposed to a boundary regulator and trunk service installation) locations

There is a program for the next AA period from FY26 to FY31 to renew and upgrade the Priority 2A and higher risk 2B sites to elevated pressure operation by insertion of the old (trunk) services and removal of the boundary regulator. The remaining Priority 2B will be upgraded within the following AA period, and Priority 3 monitored.

8.5.2.4 DCVG and Pipeline Dig ups

Steel pipelines can be prone to corrosion, which if left untreated can lead to pipeline integrity failure and a major uncontrolled gas escape.

To help mitigate the corrosion risk, one of the methods we use to manage corrosion is to conduct direct current voltage gradient (DCVG) surveys, which detect faults in pipeline coatings. The DCVG surveys are followed by direct inspection excavations (or 'dig ups') of areas where DCVG indicates the pipeline coating has failed.

A small number of DCVG surveys to detect faults in pipeline coatings will be undertaken.

8.5.2.5 Leak Detection and Analysis

Regular leak surveys of our gas network are important to maintain public safety, operational efficiency and compliance. We are looking to replace our current system with a modern industry standard alternative offering a broader a range of gas detection capabilities with advanced data analytics. An alternative new model currently being explored offers enhanced sensitivity. It can detect leaks with greater accuracy by accounting for wind direction and speed, making it suitable for both mobile leak detection and stationary monitoring over significantly larger areas.

9 Lifecycle Strategies – Network Facilities

9.1 Asset Description

The asset subgroups of Network Facilities include gate stations, regulating stations, heater facilities, isolation valves, odorisation facilities, and cathodic protection.

Several of these secondary asset groups have significant effects on gas supply:

- Gate Regulator Stations (GRS), which are the primary supply points for the networks where failure could result in reduced or total loss of supply to tens of thousands of customers;
- Gas heating facilities (usually located at GRS facilities), where failure would have similar effects to failure of GRSs; and
- District regulator stations, which deliver gas into lower pressure networks, where failure could result in reduced or total loss of supply to between hundreds and thousands of customers.

9.1.1 Gate Regulating Stations

These facilities are typically co-located at the custody transfer points. They reduce and control the upstream transmission pipeline pressures to a level consistent with the MAOP of AGN's downstream transmission pipelines.

Gate regulating stations consist of filters, isolation, bypass and pressure control valves, and in some instances gas heating facilities. They are located in fenced compounds.

There is 1 gate station owned by AGN within AGN South Australia distribution networks (excluding the Riverland Pipeline). The gate station was commissioned in 2015 and located in Virginia, South Australia. A second gate station is due to be commissioned in early 2026 in Gawler.

Gate stations are typically upgraded or replaced when demand from the downstream networks exceeds their capacity or when components are no longer available to adequately maintain the facility.

9.1.2 Gas Heaters (at Gate Regulating Stations)

Gas heaters are often required at GRSs, where large pressure reductions occur. The Joule-Thompson (JT) effect of this loss of pressure reduces the temperature of the gas to below the safe operating limit of the downstream equipment, requiring the gas to be pre-heated to keep the gas within the safe operating envelope.

Water Bath Heaters (WBH) are the most common type, consisting of gas fired "fire tubes" which heating up a tank of water. The flowing gas stream also passes through this "water bath" in a separate set of tubes, and absorbs heat from the water.

The typical service life of a WBH coil is approximately 25 years, when maintained in accordance with the preventative maintenance schedule. When a coil is assessed as having reached the end of its life, its dimensions are verified and a new coil ordered from the supplier. Once the new coil is received (typically within 2-3 months), the heater is taken out of service and the new coil fitted in place of the old one.

There is 1 heating facility within AGN South Australia distribution networks, which is the water bath heater in the Virginia Gate Station with an additional one soon to be installed at the Gawler Gate Regulating Station.

9.1.3 District Regulating Stations

Regulating stations control the delivery of gas into the TP, HP, MP, and LP distribution networks within the allowable operating pressure of the downstream network. These facilities consist of filters, isolation, bypass and pressure control valves that are located in either below ground vaults or above ground kiosks.

There are 178 operating regulating stations (as of June 2025) within the SA distribution networks and a further 5 stations in Mildura, which range in capacity and pressure regulation depending on the network they feed. The age of these facilities varies between a few years up to 40 years.

Regulating stations are typically upgraded or replaced when demand from the downstream networks exceeds their capacity, when they become obsolete due to mains replacement or when components are no longer available to adequately maintain the facility.

Table 19 summarises the district regulating stations, with inlet and outlet pressures as of June 2025.

Table 19 – Regulating Stations in South Australia

	Outlet Pressure			
Inlet Pressure	**High**	**Medium**	**Low**	**Total**
Transmission	62	28	0	90
High	0	47	12	59
Medium	0	0	29	29
Total	**62**	**75**	**41**	**178**

9.1.4 Isolation Valves

Isolation valves provide emergency isolation and control during normal operation, maintenance and emergency response situations. New valves are installed where a requirement for rapid isolation has been identified, for operational control and efficiency or regulatory compliance. Valves are replaced when they are inoperable but are still required for isolation or operational control.

9.1.5 Cathodic Protection

A network corrosion protection system is used to protect over 1,800 km of steel mains and pipelines, primarily through two methods: Impressed current cathodic protection (ICCP) and Galvanic sacrificial anodes.

ICCP units provide more effective and reliable corrosion protection, particularly in soils with high resistivity, and where high corrosion protection currents are required (e.g. at coating defects). These units can be adjusted to provide the right level of protection (current), compensating for coating defects.

9.2 Plan and Create

Network growth is reviewed on a regular basis to evaluate the following:

- Whether a new gate station is needed
- To determine whether augmentation projects require new regulators and/or heaters to be installed to boost pressures in the network

Over the next 5-10 years no new Gate Stations or Gas Heating Stations are forecast. On average, an additional 1-2 new pressure regulators are added. Valves will be added to the network where emergency isolation is required.

9.3 Operate and Maintain

A preventative maintenance program is in place, managed through AGN's Maximo Enterprise Asset Management system (EAM). The maintenance strategy is to continue existing maintenance regimes, and undertake reactive repair (or replacement) when new issues or risks are identified.

- Gate and other regulator stations – Maintenance on district regulator stations is carried out on a three-month, annual, and five-year basis. The three monthly and annual checks include inspection, set point and operational checks. The five-yearly maintenance activities include a

major overhaul of the regulators, control valves and pilots. All soft seal components are replaced;

- Valve maintenance – Valve maintenance comprises annual inspection and maintenance of transmission and critical emergency isolation valves, and three-yearly inspection and maintenance of other network valves; and
- Corrosion prevention monitoring – Inspection of CP units is carried out in accordance with AS/NZS 2832.1 and AS/NZS 2885. The operational status of galvanic anodes is gathered every six months from control area surveys. Pipeline potentials are provided through impressed current cathodic protection (ICCP) units, which are monitored via the SCADA system. ICCP units provide effective and reliable corrosion protection, particularly in soils with high resistivity, and where high corrosion protection currents are required (e.g. at coating defects).

9.4 Monitor and Review

The performance of gate stations is assessed annually to determine whether the gate station (or components) need to be upgraded and determine timing including future demand. Detailed engineering is required to determine the full scope of the upgrades.

9.5 Risks and Strategies

Below are the Network Facilities risks and strategies that relate to AGN South Australian Networks' capacity and integrity management programs.

9.5.1 Capacity Related Strategies

The network facilities are reviewed as part of the periodic network assessment. The key facilities projected flows are taken from the models and reviewed against their capacities. The modelling includes factoring in peak winter flows, network pressures, historic growth levels and forecast growth rates. There are typically 2 major augmentations over a 5 year period and 1-2 new pressure regulators over a 5-10 year period.

No new gate regulating stations or heaters are forecast to be required over the next 10 years.

9.5.2 Integrity Related Strategies

9.5.2.1 District Regulator Stations

District Regulating Stations (DRS) facilities are required to regulate pressure from higher-pressure networks to a lower pressure network.

Overpressure risks in the network are being systematically addressed through a risk-based remediation program, to upgrade TP DRS and high-risk DP DRS to the latest industry standards. DRS will be replaced or modified in situ to include dual regulation runs and overpressure protection.

DRS with insufficient protection against traffic and construction vehicles will have protective bollards installed, commencing with the highest risk locations.

9.5.2.2 Valves

In the event of an emergency, such as a pipeline rupture or leak, valves are required to isolate the leak to minimise the impact to customers and enable repairs to be undertaken. Valves should be installed at critical locations and maintained to that they can be accessed safely and reliably when needed.

When valves are found to be inoperable, they will be replaced as a part of risk-based prioritized program. The valve replacement program will be uplifted to address the backlog of inoperable valves and address new seized steel valves.

Additional valves will be installed on the M42 pipeline at the River Torrens bridge crossing for emergency isolation.

Buried TP valves and syphons are vulnerable to damage without protection or visibility. Chambers will be installed to provide visibility and accessibility for inspections.

9.5.2.3 Cathodic Protection

South Australian natural gas distribution networks of approximately 200 km of steel transmission pipelines and 1,600 km of distribution pipelines is protected by Galvanic sacrificial anodes and Impressed Current Cathodic Protection units (ICCP's). ICCP's typically have a 25 year replacement life, whereas the anode beds are replaced based on their bi-monthly and 6 monthly potential survey readings.

Cathodic protection (CP) is installed on our transmission pipelines (and distribution pipelines) to maintain an effective CP system and protect the pipelines against corrosion extending their operational life.

ICCP units and sacrificial anodes will be replaced where they have reached the end of their technical life and installed in parts of the network where the CP system is underperforming.

Where current leakage from customer's premises is interfering with the cathodic protection system and accelerating corrosion, electrical isolation devices will be installed on the service to prevent stray current.

CP projects will be delivered over 5-10 years.

9.5.2.4 Corrosion Protection

Steel assets face significant corrosion issues, in addition to underperforming cathodic protection.

Valves and assets at soil-to-air interfaces are vulnerable to failing coatings requiring a proactive inspection and reapplication program.

Replacing obsolete Direct Current Drainage systems will prevent stray current from the tram network corroding steel assets.

10 Lifecycle Strategies – Metering Facilities

10.1 Asset Description

Australian Gas Networks Limited (AGN) reticulates gas to approximately 485,000 customers in the South Australian natural gas distribution networks. The volume of gas delivered to a customer is measured through a meter, with meter measurements being a key input into customer bills.

The metering facility includes the meter isolation valve, pipe and fittings, pressure regulator and the meter. Four types of meters are used for domestic, I&C and demand customer metering:

- Diaphragm meters – domestic consumer and smaller I&C customer installations;
- Rotary meters - medium to large I&C customer installations;
- Turbine meters - very large I&C customer installations; and
- Coriolis meters – very large I&C customer installations.

Table 21 – Total Installed Meters (as at November 2024)

Meters	South Australian Networks
Domestic	466,022
I&C	19,618
Total	485,649

Figure 7 and Figure 8 shows the age profile for domestic and I&C meter fleets.

Figure 7 - Age Profile for Domestic meters as at November 2024 (for South Australia Network)

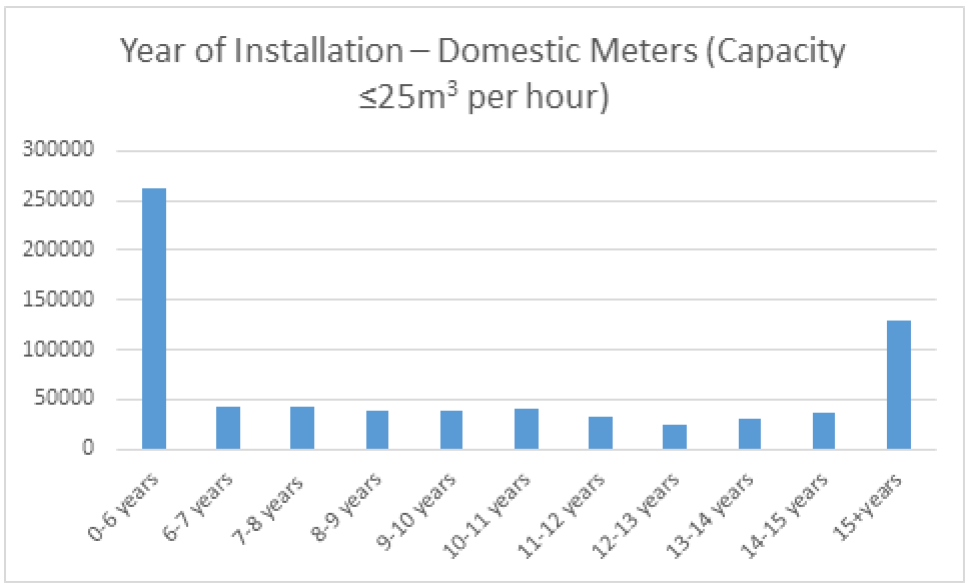
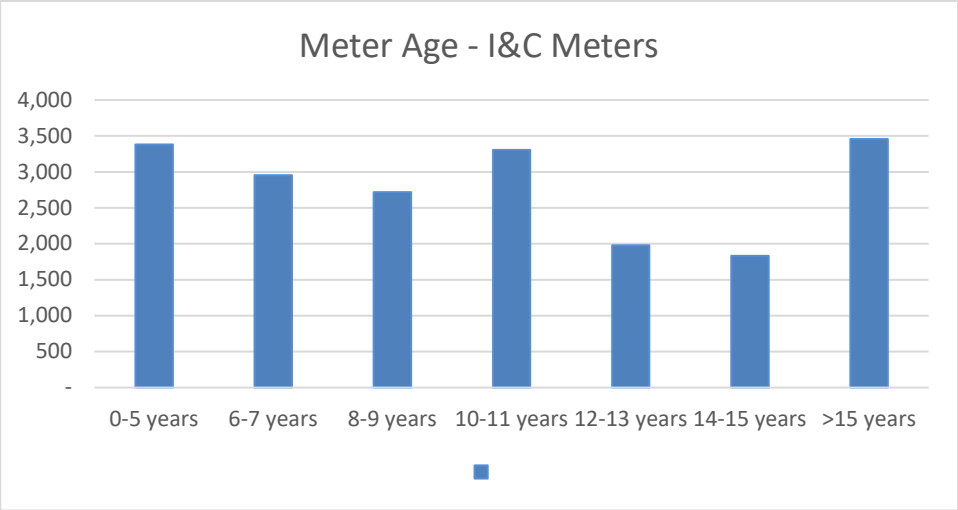


Figure 8 - Age Profile for I&C meters as at November 2024 (South Australia Networks)



10.2 Plan and Create

Residential connections are forecast to increase by an average annual rate of 0.30%, while commercial connection growth is forecast to decline moderately over the next AA period. This reflects approximately an additional 34,000 meters which will be added to AGN South Australian Networks in the next AA.

For the most common meter designs, a standard meter list is used to select the type of meter based on the inlet and outlet pressure requirements and the load size. The most common meter installations are as follows:

- Domestic meters are usually the EDMI U8 or Ampy 750
- I&C meters are most frequently simple designs such as the Ampy 1010 and the EDMI U10, AL425 or AL1000 meters, but larger loads may require a more complex rotary meter set design i.e. G40, G65, G100, or G160
- EDMI Digital meters will be used for the new digital meter strategy in both domestic and I&C installations.

10.3 Operate and Maintain

AGN has a regulatory obligation under the Gas Metering Code to manage the integrity of meters and ensure they operate within a prescribed tolerance band for metering accuracy. Periodic Meter Changes (PMCs) must be carried out to test the accuracy of meters and replace meters when the accuracy of measurement falls outside the prescribed band.

In addition to replacing meters that no longer satisfy the prescribed tolerance band for metering accuracy, there are occasions where individual meters become defective and require replacement.

We also have an obligation to collect metering data and provide it to gas retailers in a timely manner for billing purposes.

Domestic meter installations are designed not to require routine maintenance other than in-service compliance testing of meter families. Maintenance is limited to responding to isolated meter failures. The maintenance program for industrial and commercial meters includes periodic operational checks, lubrication, and painting.

Maintenance activities for specific types of meter installation are described below.

- Low pressure installations – Low pressure sites are sites that operate at less than 7 kPa. These sites all have smaller diaphragm meters and no routine maintenance is carried out unless the consumer, retailer or APA personnel report a problem
- Elevated pressure installations with remote telemetry and correcting instruments – The sites are visited every six months to check meter accuracy, operation of components and check for leaks:
- Elevated pressure, flow, and temperature installations with flow correcting instruments and no remote telemetry – These installations are checked annually to check meter accuracy, operation of components and check for leaks.
- Elevated pressure installations with no correcting instruments and no remote telemetry – These installations are visited either annually if they have a pressure relief valve or every three years if they do not. These site checks include checking meter accuracy, operation of components and check for leaks. The meter set is also painted if required. There are no plans to change the maintenance regimes in the next 5 years.

10.4 Monitor and Review

Meter leak repair and remedy trends are gathered and reported during the annual distribution performance review. These trends are reviewed leading to future meter strategies.

10.5 Manage Risks and Strategies

10.5.1 Meter Replacement

AGN is required by the South Australian Gas Metering Code to carry out, or cause to be carried out various tests on meters prior to being placed into service, and during the life of its service. The tests for Domestic and I&C meters vary slightly.

The results from the testing will determine the meter life and when it is required to be changed which forms the basis of the planned meter changes. This gives rise to approximately 18,500 periodic meter replacements per year.

In addition to the PMC program, we also replace meters in response to leakage and meter measurement inaccuracy found in response to customer complaints.

Meters are also removed for testing and may have their field life extended as a result.

Approximately 115,000 domestic and I&C meters will be replaced over the next 5 years.

10.5.2 Digital Metering Strategy

AGN has an obligation to collect metering data and provide it to gas retailers in a timely manner for billing purposes.

Remote digital metering allows for a more consistent method of performing meter readings across the network. Once installed, a remote digital meter can be read by driving past the location. This allows further privacy for the consumer, freedom to the location of the gas meter on their premise, prevents the need for estimated reads, improves accuracy of gas consumption billing and time efficiencies.

The strategy is to replace domestic meters at inaccessible or difficult/dangerous to access sites with digital meters. This activity will mitigate the moderate health, safety, reputational and customer risks by no longer requiring estimated reads at challenging sites.

We are also proposing to install digital meters for small I&C customers where they have reached their end of life, which will enable us to explore 'time of use' consumption capabilities to inform future long-term replacement planning.

10.5.3 Meter Sets

Meter sets comprise the valve, pipework, regulators, fittings and other minor components required to connect the meter. They are not replaced regularly like the meters.

Meter set risk for larger meters sets used for I&C Customers will be managed in a more holistic manner to address over pressure and corrosion. Meter sets without adequate pressure control will be upgraded to add new pressure control bypasses or adding pressure control to existing bypasses. Meter sets will also be proactively refurbished before pipework and components become inoperable due to corrosion.

Domestic meters and meter sets that have been identified as non-compliant due to their location will be relocated to a compliant location. Non-compliance arises due to legacy issues, private renovation work or compliance standards.

11 Lifecycle Strategies – SCADA Facilities

11.1 Asset Description

A SCADA system is used for monitoring and reporting gas flow, temperature and pressure in real time. The South Australian SCADA system monitors over 290 critical sites including gate stations, district regulator stations (DRS), critical transmission and high pressure regulators, compressor stations, cathodic protection units, network fringe points and demand customers.

Failure of SCADA monitoring to critical facilities such as gate stations and major DRS would result in the inability to detect (and thus respond to) alarms, although the station would continue to operate as designed. This may put at risk gas supply to hundreds to thousands of customers, depending on the site if a simultaneous fault at the station was undetected.

SCADA failures at fringe point monitoring sites would result in low network pressures not being detected, potentially resulting in poor or no supply to tens to thousands of customers.

11.2 Plan and Create

Pressure telemetry is typically installed at all regulators and extremity points in the network. Flow telemetry are installed at gate stations and critical regulators. Temperature telemetry are installed at most Water Bath Heater facilities.

Based on previous years, an additional 2-4 pressure telemetry locations are forecasted per year.

11.3 Operate and Maintain

The maintenance schedule for SCADA and telemetry systems comprises an annual visit to each site to:

- Test and calibrate all instruments, pressure and temperature transmitters, and verify flow computer calculations;
- Test batteries conditions and earthing systems;
- Clean solar systems and verify functionality; and
- Inspect hazardous area installations.

11.4 Manage Risks and Strategies

Typical issues being found are:

- Batteries requiring replacement;
- Slam shut switches sticking; and
- Rift of pressure transmitter calibration.

Generally, SCADA facilities are replaced as result of technical obsolescence. SCADA facilities have a technical life of about ten years. Over the last five years the move to standard communication protocols (GSM/GPRS) has driven changes to field devices using telecommunications.

The central SCADA facility (hardware/software) has been upgraded to the national APA Geo SCADA platform.

11.4.1 SCADA Strategies

11.4.1.1 Obsolete RTU's

The AGN SCADA system monitors and reports on the pressure and temperature of gas at gate stations, regulating stations, large customer sites and remote monitoring of fringe pressures. Remote Telemetry Units (RTU's) are used in the AGN SCADA system to collect and transmit data from remote locations.

There are 165 Remote Telemetry Units (RTU's) in the South Australian gas distribution network which are soon to be retired and no longer supported by their manufacturers. The plan is to replace the RTUs at a deliverable and sustainable rate. Replacements are prioritised based on number of customers affected, remote locations, whether they are SCADA controlled (critical stations), age and faults.

Telemetry at Regulators and Fringe Points

Several regulators and network fringe sites in regional areas in AGN's South Australian network do not have SCADA monitoring equipment. It is therefore not possible to monitor pressures at these sites on an ongoing basis.

Real time SCADA monitoring of regulator supply pressures provides a "health" check of these facilities allowing timely diagnosis and rectification of equipment performance issues before problems arise. The goal is to ensure that the minimum supply pressure is maintained at distribution supply points, fringe points and the outlet of the meter.

The plan is to continue to identify critical locations at regulators and fringe points in the network and install SCADA telemetry at these sites.

11.4.1.2 24/7 Monitoring Capability

The AGN South Australian network is not monitored by a dedicated operator around the clock. Not having a 24/7 monitoring capability means there is a significant risk SCADA alarms can be missed and our emergency response significantly delayed. Moreover, our reliance on remote log in and text messaging means we are dependent on mobile communication coverage as well as the availability of the supervisory staff.

To improve our monitoring capabilities and minimise the risk of network alarms being missed (or slow response times), we propose to establish a dedicated monitoring room, with modern and fit-for-purpose equipment in a secure and distraction-free environment. We will also increase our SCADA resourcing so that the monitoring room can be manned around the clock, meaning we will have true 24/7 monitoring rather than a minimal on-call crew outside of business hours.