Gas Network

SCADA Strategy

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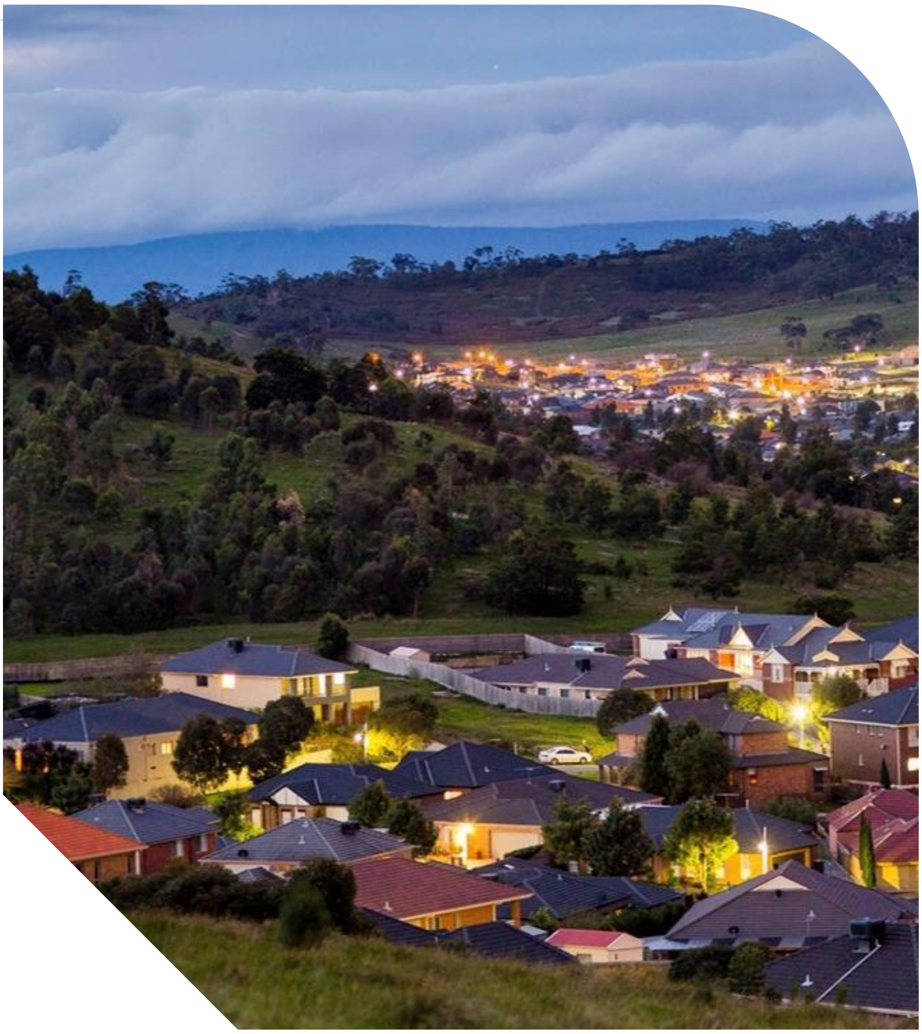

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Executive Summary

This document outlines the capital works programs and expenditure proposed for AusNet Services' Supervisory Control and Data Acquisition (SCADA) assets for the 2024-28 access arrangement period.

SCADA assets are used to remotely control and monitor equipment by operating over communication channels. AusNet Services' Customer and Energy Operations Team (CEOT) utilise the SCADA system to provide 24-hour visibility of the gas network via Remote Telemetry Units (RTU's). The CEOT can remotely control pressure values at various sites across the gas network, as well as monitor on site measures such as temperature, flow, explosive limits, water levels in pits, instrumentation status and other event data.

AusNet Services' proposed SCADA program is driven by seven Gas Network Objectives:

- Maintain Network Safety in accordance with the Gas Safety Case;
- Maintain top quartile operating efficiency;
- Undertake prudent and sustainable network investment; and
- Delivery of valued services to our customers.
- Simplify and remove cost by investing in technology and automation;
- Provide sector leading customer experience by improving systems, processes and communication;
- Secure future for gas with increased utilisation and renewable gas options.

The vision for AusNet Services' Gas SCADA network is to ensure the relevant stakeholders (such as CEOT and Network Planning) have adequate and relevant visibility over the gas network. It is also to ensure that personnel working on SCADA assets can continue to do so in a safe manner, whilst also maintaining current levels of technology serviceability.

Table 1: Planned SCADA Capex Summary ($2022, $'000)

PROGRAM		2023-24	2024-25	2025-26	2026-27	2027-28	2024-28 TOTAL
		[C.I.C]					

1. Document Overview

1.1. Purpose

The Supervisory Control and Data Acquisition (SCADA) Strategy is one of several plant strategies developed and maintained for the management of AusNet Services' Gas Distribution Network. This document provides background on SCADA assets and describes the approach used to manage them.

1.2. Scope

SCADA systems are used to remotely control and monitor equipment by operating over communication channels. This SCADA strategy covers the equipment which supports the communication and control of data but not the communication system itself. The communication system is covered in *AMS 30-59 Communication Systems*.

1.3. Definitions

CEOT	Customer and Energy Operations Team
GaSPC	Gas System Pressure Control
IEC-EX	International Electo-technical Commission Explosive
OSI Pi	Pi Historian software program used for data trending
RCD	Residual Current Device
RCPR	Remote Cathodic Protection Recorder
RPR	Remote Pressure Recorder
RTU	Remote Telemetry Unit
SCADA	Supervisory Control and Data Acquisition
SSB	Slam Shut B (leg
SSP	Slam Shut Panel

1.4. Asset Management Framework

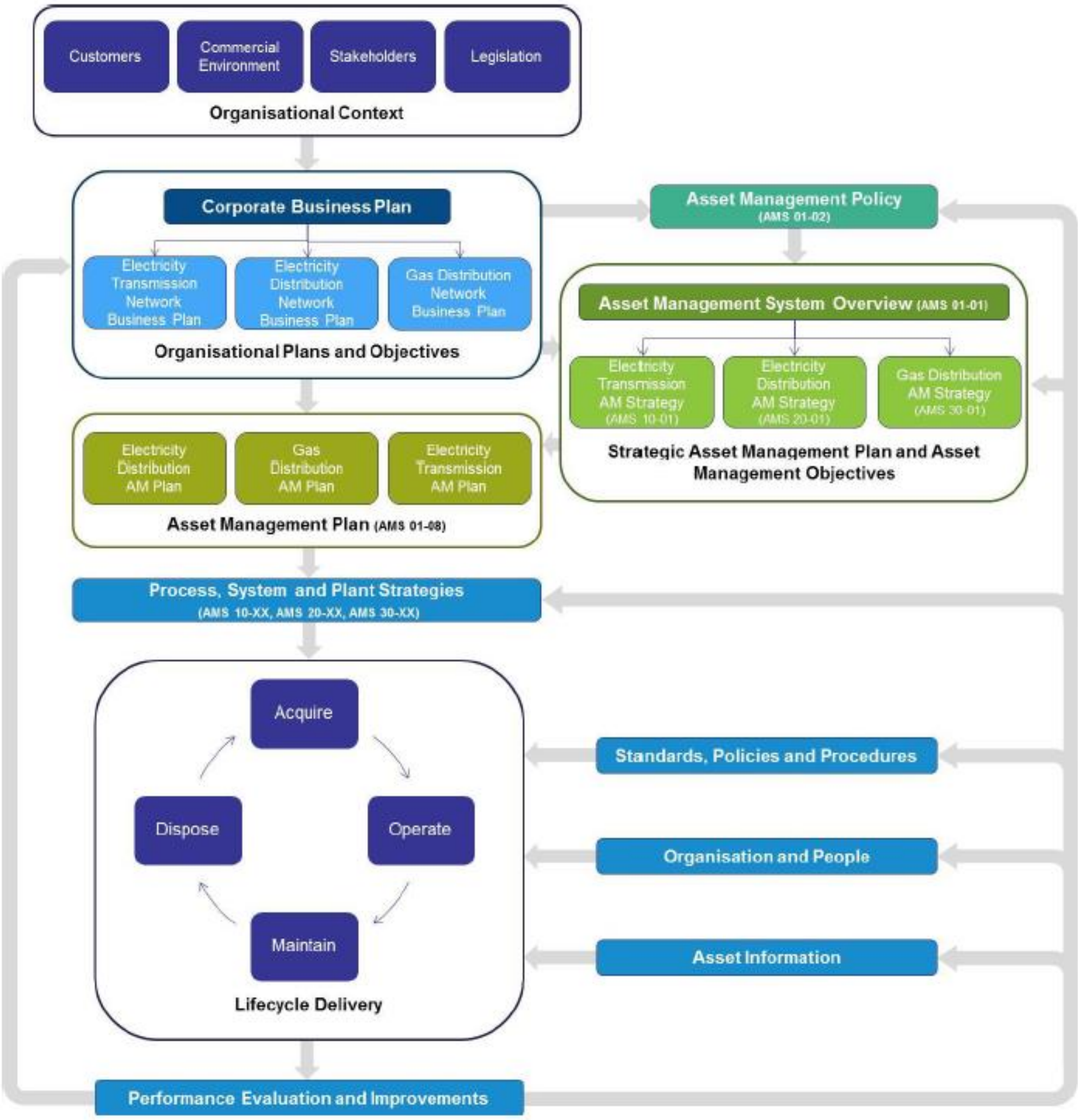

Figure 1 below provides an overview of AusNet Services asset management framework. This framework is centred around the objective to operate the network in top quartile of efficiency benchmarks with an aim to care for customers and strive to make energy more affordable.

The Gas asset management strategy plays a key role in ensuring alignment between asset management objectives, corporate objectives, and stakeholder requirement. This document is one of the strategies providing visibility on network performance, issues, risks, and investment required to support delivery of safe and reliable service and achieve the long-term objectives of the gas distribution network.

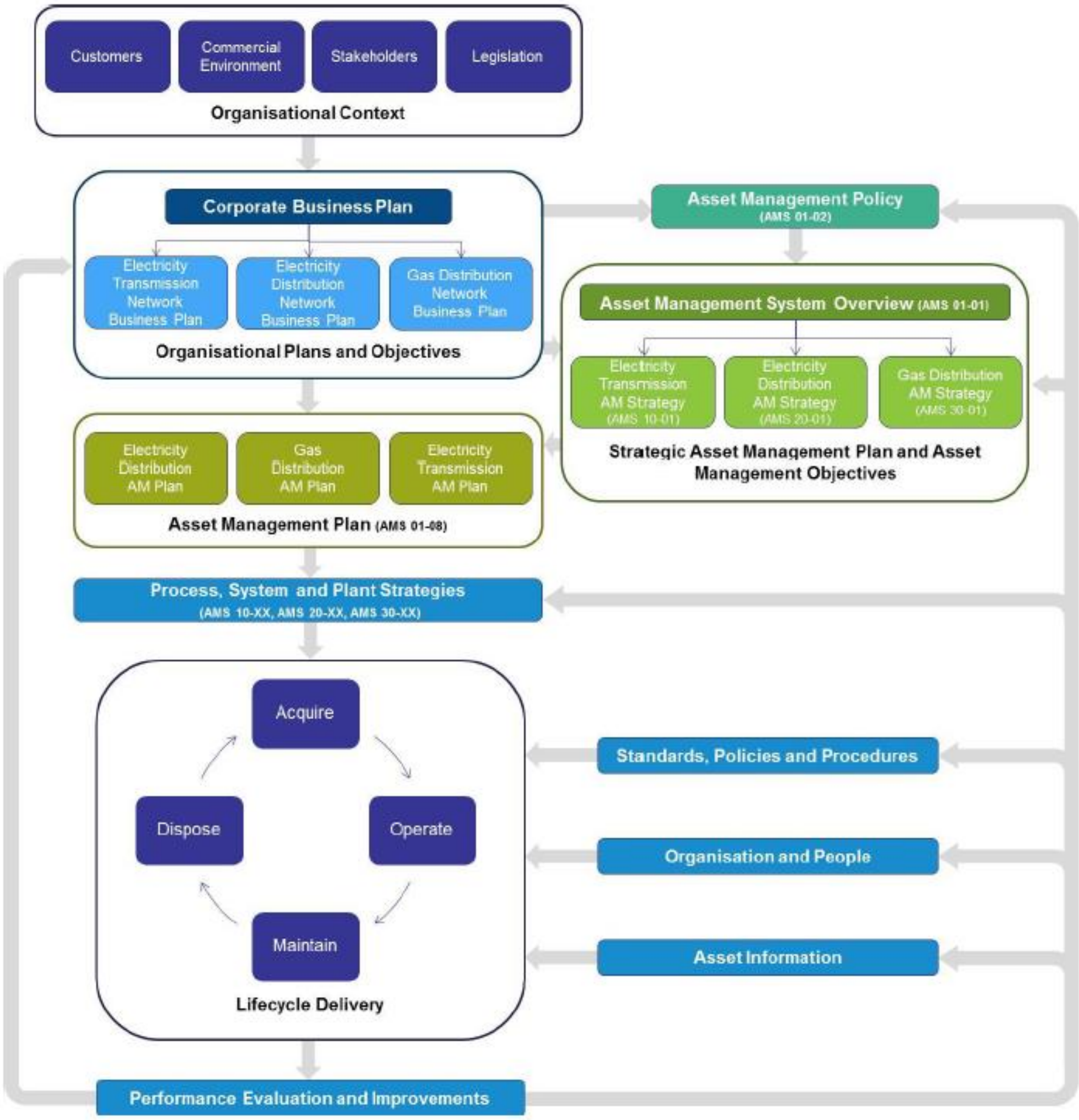

Figure 1: Ausnet Services Asset Management Framework

1.5. References

Other referenced documents within this strategy are:

- AMS 30-01 Gas Asset Management Strategy
- AMS 30-59 Communications Systems Strategy
- Fringe RTU Location Report
- Gas Safety Act 1997
- Gas Distribution System Code (Version 10)
- Gas Safety Case
- TS4356 Metering Room

2. Alignment with Drivers

AusNet Services' purpose statement is "Connecting communities with energy and to accelerate a sustainable future". This statement places the customer (as individuals and communities) at the forefront as a business driver and acknowledges the critical relationship with their energy supply and usage. The following diagrams shows that Customers are a key theme linking the Corporate Business Strategy with the Gas Network Vision and Gas Network Objectives, which influence the key plant strategies forming the basis of the regulatory submission.

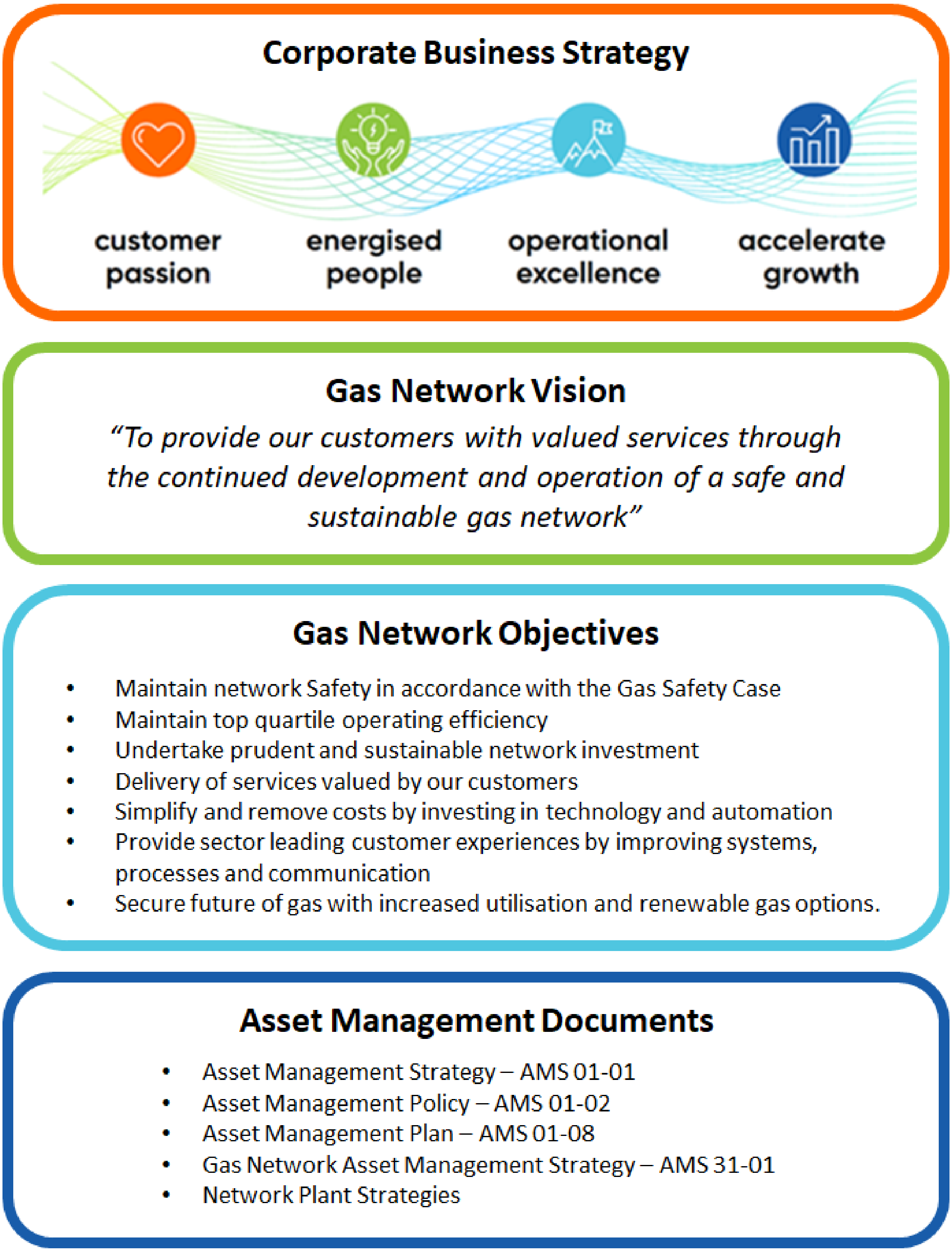

Figure 2: The Business Strategy, Network Vision and Objectives all centre around our customers

The Gas Network Objectives align with the four Corporate Business Objectives as shown below:

Maintain network Safety in accordance with the Gas Safety Case.

Maintaining network safety supports our commitment to "Mission Zero", ensuring our people go home safety at the end of the day. This is one of the strategic priorities of the "energised people" corporate objective.

Maintain top quartile operating efficiency.

AusNet Services aspires to operate all three of its core networks in the top quartile of efficiency benchmarks. This aligns with the "operational excellence" corporate objective.

Undertake prudent and sustainable network investment.

This network objective supports AusNet Services' obligation to undertake prudent and sustainable network investment, as defined in the National Gas Rules and Gas Distribution System Code. This in turn aligns with the "operational excellence" corporate objective.

Delivery of valued services to our customers.

AusNet Services strives to better understand our customers (their needs and behaviours) in order to deliver the services they value. This aligns with the "customer passion" corporate objective.

Simplify and remove costs by investing in technology and automation.

By working more efficiently, AusNet Services improves its "operational excellence" and provides better value for customers.

Provide sector leading customer experiences by improving systems, process and communication.

Similarly, improving how we work increases efficiency, thereby improving "operational excellence".

Secure future of gas with increased utilisation and renewable gas options.

Exploration of renewable gas options and the role gas will play in the energy ecosystem of the future will support the "accelerate growth" corporate objective.

3. Asset Overview

3.1. Introduction

SCADA systems are used to remotely control and monitor equipment by operating over communication channels. AusNet Services' CEOT utilise the SCADA system to provide 24-hour visibility of the gas network via RTU's.

The SCADA system provides real-time data on the performance of assets, such as pressure, temperature, flow, etc. This data is used to monitor the network, as well as provide long-term trending information. This can be employed for long-term evaluation of gas demand and for network modelling to improve network capacity and system performance. SCADA is an integral tool for controllers and engineers, assisting in effective responses during emergencies and real-time operational management of the network.

The Gas SCADA network infrastructure can be separated into three main parts:

- Master Station – Controller interface at CEOT;
- Communications – Radio base station and communication protocols; and
- Remote Assets – Control, monitoring and auxiliary equipment on site.

3.2. Asset Description – Master Station

The SCADA master station polls the remote station data in real-time, interprets it and displays it to the operations personnel at the CEOT. Plant control is performed by the CEOT via the SCADA system which issues control commands to the remote station device. The SCADA system presents the information in schematic representation and overview diagrams. Operator attention is also drawn to alarms and events as well as critical issues derived from rule based calculations within the SCADA system.

3.3. Asset Description – Communications

Communications assets are an integral part of the SCADA network and ensure that the gas network has the ability to transport data back to the master station.

The following types of communications assets are installed:

- Communications devices associated with remote gas devices (e.g. RTU's) Communications wireless base station infrastructure used for the purpose of communicating to remote field devices;
- Communications back-haul infrastructure for the purpose of backhauling data traffic from base stations to data centre(s).

For further detail, refer to *AMS 30-59 Communication Systems*.

3.4. Asset Description – Remote Systems

The SCADA system uses RTU's to monitor and/or control the operation of 100% of the gas Transmission and Distribution systems. SCADA provides information that is used to maximise the operational efficiency of the gas network and manage gas flows during routine and unplanned operations. There are four types of sites as listed below:

- **Fringe RTU** sites send real-time data back through the SCADA interface and are used to monitor the pressure at the lowest pressure extremity of a network, allowing the control room operators to react to pre-determined alarm limits;
- **Monitored** pressure regulating sites where the outlet pressures are adjusted by field personnel at the site and SCADA is used to alert the control room operators if pre-determined alarm limits (pressure, temperature, access) are breached. The controllers have the ability to only monitor the data points at these sites, not make any remote changes;
- **Controlled** pressure regulating sites are sites where the pressure set-point of the regulator has the capability (via the SCADA system) to be altered and set remotely by the controller at the CEOT; and
- **Fringe controlled** pressure regulating sites are sites where the SCADA system maintains a set fringe pressure by altering gas outlet pressure at the regulating station either automatically or via remote manual control from the control room.

Disaster recovery/redundancy

Regulating station pressure outlet is set on-site to a predetermined pressure (failsafe mode). This is activated if the RTU of that regulating station loses communication contact with the master station.

3.5. General SCADA Site Equipment

General SCADA site equipment shown in Figure 3, covers other equipment that supports the overall operation of the SCADA network.

- RTU Cabinets
- Antennas
- Solar Panels
- Batteries
- Junction box
- Cable supports

Figure 3: General SCADA Site equipment

3.6. Asset Summary

Table 2 below provides a summary of AusNet Services' Gas SCADA assets (as of May 2022).

Table 1: AusNet Services' SCADA Assets (as of May 2022)

SCADA Assets	Average age		19.4 years
	Number of RTU's (Total 228)	Fringe	72 RTU's
		Monitor	93 RTU's
		District Regulator	2 RTU's
		Controlled	61 RTU's
SCADA Controlled Networks	Controlled HP Networks		12 Networks
	Monitored HP Networks		15 Networks
	Monitored MP Networks		All Networks
	Monitored LP Networks		All Networks
Communications Assets	Number of Radio Base Stations		9 Sites
	Data / Control Centres		2 Sites

3.7. Age Profile

The average age of RTU's installed in AusNet Services' gas network is 19 years as shown in Figure 4 below, in comparison to an expected life of 15 years.

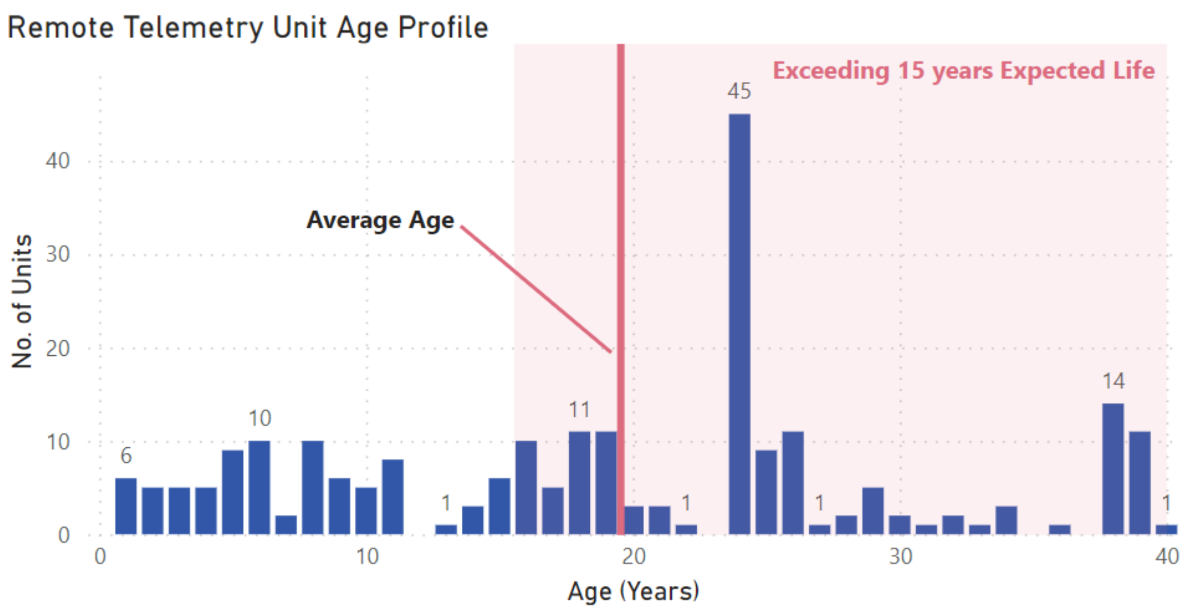

Figure 4: RTU Age Profile

SCADA assets are not replaced as part of a planned schedule replacement based on expected life but rather are reactively replaced based on asset failure, asset obsolescence, certification expiration, and technological upgrades.

4. Risks

It is critical that SCADA system and communication equipment are relevant and compliant to ensure safe and accurate representation of the performance of the gas network. In particular it is critical to have equipment that provides reliable information in times when outage management is required or to model network performance.

Failure of SCADA equipment can result in catastrophic failure of gas equipment in the field. The CEOT would be unable to have visibility of current operating characteristics such as pressure, temperature, set points, etc. It would remove the ability of the CEOT to be both proactive before faults occur, and reactively troubleshoot once a fault has occurred. Constant visibility of data points at sites ensures that gas controllers can make informed decisions based on real-time data. It also mitigates the risk of public harm by ensuring that failure of high consequence equipment results in prompt CEOT and field response, and therefore rectification. Public harm will most likely be in the form of an explosion if equipment design limits are breached and not immediately identified.

Risk is also present due to the potential for lightning strike near to the facilities. Lightning strike can create a potential difference between items within a city gate. The presence of a potential difference within a city gate can lead to arcing, and in the presence of a gas leak can lead to an explosive environment.

An additional safety risk is the risk of electric shock to personnel working on equipment in SCADA cabinets that do not have residual current device protection.

5. SCADA Strategies

5.1. Fringe RTU Installation / Relocation

Fringe RTU's are installed at the outer boundary of networks to monitor pressure levels at the expected geographical point with the lowest pressure. These RTU's then utilise the communications network to send real-time pressure data back to the CEOT control room. The fringe pressure data points can be viewed via the GaSPC software program and used to make real-time decisions regarding pressure set points upstream of the fringe RTU to ensure that minimum obligated pressure levels are sustained. Data is also captured within the OSI Pi software application and utilised for trending and analysis purposes.

5.1.1. New RTU Fringe locations

An analysis of network growth has identified a total of 5 new growth corridors of the network from strong residential estate developments projected to require effective real-time network pressure management by the installation of new fringe pressure RTUs. These growth corridors include:

1. Rockbank
2. Sunbury East
3. Armstrong Creek
4. Lucas
5. Avoca

5.1.2. RTU Fringe relocations

Analysis of existing RTU fringe locations has also identified a total of 3 fringe RTUs to require relocation due to continued strong residential growth expanding the extremities of these established networks, resulting in the existing RTU locations no longer representing the true fringe locations. These existing fringe locations include:

1. Yuroke
2. Mambourin
3. Strathfieldsaye

Strategies:

- ***Continue installation of new fringe RTU's for new growth areas.***
- ***Relocate fringe RTU when it is no longer located on the fringe.***

Refer to Section 8 for site details of the proposed program of works.

5.2. Asset End of Life Replacement

A number of equipment types installed on the SCADA network have been identified as requiring upgrade due to future serviceability and compliance.

5.2.1. [C.I.C] Replacement

Background

To have the capability to send data back to the master station, a piece of equipment called a Central Processing Unit module is installed in the SCADA RTU cabinet. A module called [C.I.C] is utilised, manufactured by [C.I.C] to send fault alarm data back to the master station at the CEOT.

In mid-2014, AusNet Services was made aware that by the end of 2015, [C.I.C] would cease manufacture of the [C.I.C] module and replace it with a model called [C.I.C]. The new model has the capability to have 16 alarm points (compared to the [C.I.C] which could only have up to 3). This would increase the capability of the controllers at the CEOT to troubleshoot alarms more effectively. However, an announcement has recently been made by [C.I.C] manufacturer in 2021, that the [C.I.C]modules are now facing end of life with supply expected to cease indefinitely in 2 years. [C.I.C] modules will now need to be replaced with a newer model in production of [C.I.C] modules. [C.I.C] modules also have a completely different code and programming requirement compared to [C.I.C] and [C.I.C] requiring programming and development to integrate with existing SCADA system.

Furthermore, the existing backplane in the cabinet will not operate with the [C.I.C] and consequently any replacement of the Central Processing Unit will necessitate replacement of the backplane.

[C.I.C]

Figure 5: SCADA Cabinet with [C.I.C]

Replacement

A small volume of 25 proactive [C.I.C] replacements with [C.I.C] modules has been completed since 2018.These have been mainly critical City Gates station sites. There have also been 16 new sites built with [C.I.C]. AusNet will continue to keep the existing [C.I.C], obtaining spares to guarantee a long life.

It is proposed for the continuation of this program to replace [C.I.C] modules at further critical regulator installation sites with latest [C.I.C] modules and utilise the removed [C.I.C] as strategic spares to be used to maintain the remaining [C.I.C].

Therefore, an analysis has been undertaken to determine the most critical group of regulator installation sites to be comprised of the remainder 21 City Gate stations and selected 29 critical field regulators in the metro networks supplying large number of customers with highest risks and their SCADA operations are essential to maintain the safety and reliability for the highest consequence parts of the metropolitan network.

Strategies:

- ***Install new [C.I.C] and backplanes at a small number of sites across the gas SCADA network.***
- ***Utilise decommissioned [C.I.C] as spare parts to extend the life of sites fitted with [C.I.C].***

Refer to Section 8 for details of the proposed program of works.

5.2.2. RTU Cabinet Replacement

Background

RTU Cabinets are part of SCADA site equipment that supports the overall operation of the SCADA network. These cabinets provide essential asset protection and security for the SCADA internal components and risks to public safety in the extreme event of asset failure. Therefore, these RTU cabinets in good condition are effective in preventing natural deteriorations and third-party damage for critical SCADA assets.

A number of SCADA installations with their cabinets installed back in 1980s and 1990s have displayed substantial physical deteriorations including significant rusting and unrepairable body damages causing poor accessibility to internal component and exposure of internal components, accelerating their deteriorations.

Figure 6: Deteriorated RTU Cabinet

Replacement

From the existing 226 RTU installations, over 47 sites are at 25 years or older including 30 sites being older than 36 years as shown below age profile. The top 20 aging RTU cabinets equipment are the most deteriorated and susceptible to physical damage to be replaced with new stainless-steel cabinet to ensure long term asset protection and the public safety.

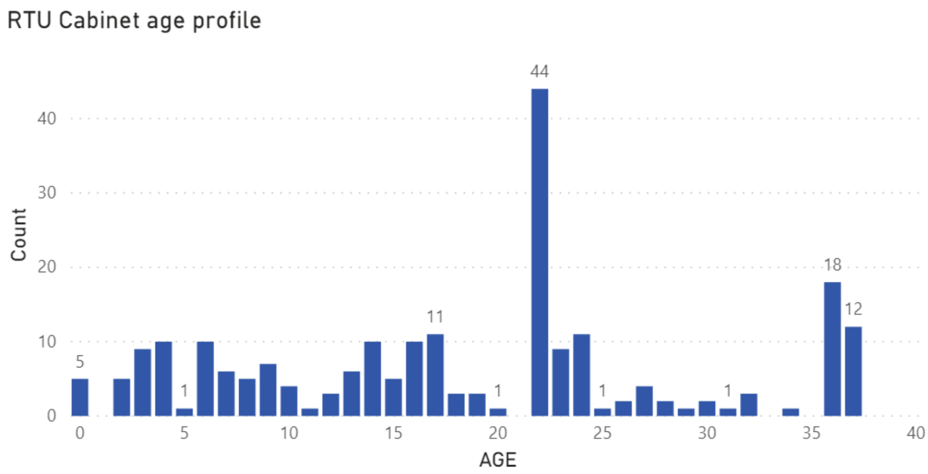

Figure 7: RTU Cabinet Age Profile

Strategy:

- ***Replace the most deteriorated RTU cabinets with stainless steel RTU cabinet.***

5.3. Temperature Transmitter Replacement

Background

Temperature transmitters typically are installed at sites where gas network controllers require visibility of the temperature. For example, the outlet pipework of a city gate has a temperature transmitter to control temperature outlet of the heater to avoid icing of critical pipework.

Replacement

A number of sites have been identified with aged [C.I.C] temperature transmitters which can no longer effectively be kept in service due to their limited configuration option of being unprogrammable with latest computer operating system. As a result, this has caused constraints in their operation and maintainability.

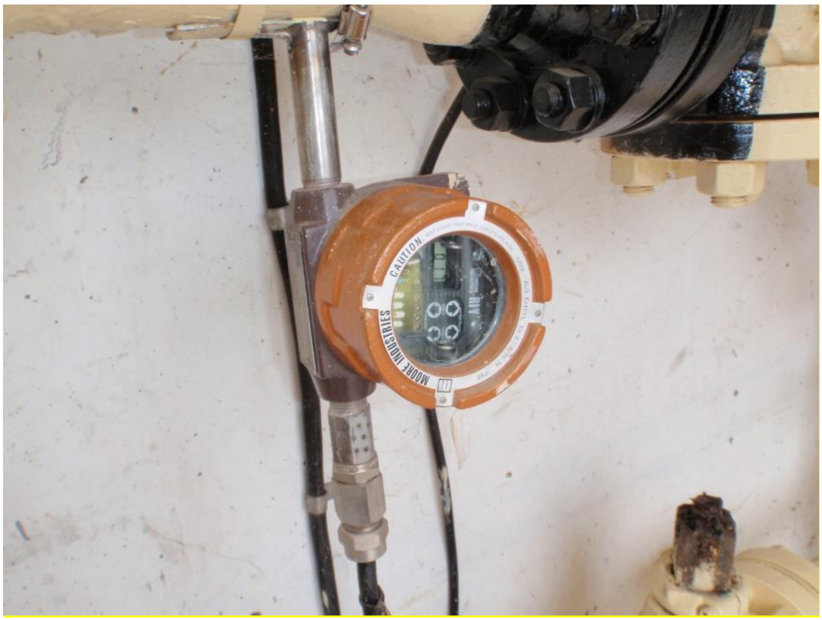

Figure 8: [C.I.C] Temperature Transmitter

All existing [C.I.C] temperature transmitters will be replaced by [C.I.C] . This has been identified as the most suitable replacement and has been installed at other newer sites on the SCADA network due to the new industry standard HART Protocol without any reliance on computer programming.

Strategy:

- ***Remove non-compliant [C.I.C] temperature transmitters and install [C.I.C].***

Refer to Section 8 for details of the proposed program of works.

5.4. Slam Shut Switch Replacement

Background

SSP's are used on pressure regulating stations to protect the downstream network against over pressurisation. Over pressurisation of downstream assets such as gas distribution pipes and customer metering facilities increase the risk of mechanical failure as these assets operate above design limits. This can result in catastrophic failures such as a gas explosion, thus posing a high risk to the public.

The SSP controls pneumatic actuators which are mounted on valves in A and B legs. The purpose of this device is to shut down a faulty run of regulators, or in the unlikely event of failure of both runs, to control within safe limits the outlet pressure of a station.

Slam shut switches monitor changes in the position of the slam shut valves from open to close and relays this information back to the control room. This provides timely detection of any over pressurisation issues that may have triggered slam shut and are critical pieces of infrastructure.

Replacement

AusNet Services' current asset base include [C.I.C] actuator installed at 35 regulator sites that have been retrofitted with "lever arm" switch type for slam shut operations. This was a work-around design to timely implement overpressure protection Slam Shut for existing regulator sites with [C.I.C] actuator valves installed. However, these retrofitted leaver arm switches have been experiencing limited performance issues and difficult to maintain due to poor compatibility resulting in frequent operational issues.

[C.I.C]

Figure 9: [C.I.C] actuator with lever arm switch type

Figure 10: [C.I.C] actuator with rotary "dome type" switch type

[C.I.C] actuator can utilise purposely designed dome switches which are installed at all AusNet Services' new or upgrades regulator sites. Therefore, the current 35 regulator sites with lever arm type switches required to be replaced with rotary "dome type" switches to ensure accuracy of slam shut operation and uniformity of slam shut switches to improve operational activities.

Strategy:

- ***Replace lever arm slam shut switches with dome slam shut switches.***

5.5. Hazardous Area Dossier Update

Background

A hazardous area is one in which an explosive atmosphere is present, or may be expected to be present, in a quantity that necessitates special precautions for the construction, installation and use of all electrical equipment, both freestanding and fixed.

This includes areas where flammable goods or combustible dusts are stored as well as when they may generate a flammable or combustible atmosphere, for example during handling, production or under certain conditions.

There are a number of key elements that need to be understood:

- The assessment of the hazard flammable zone type
- The amount of vapour/dust produced
- Gas grouping
- The lower explosive limit of the generated vapour/dust
- The level of ventilation under all conditions
- The temperature class of the zone (for the selection of appropriate electrical fittings)

Electrical companies will only 'turn on' power to a building if all defined hazardous areas have been identified and appropriate documentation presented, such as a 'Hazardous Area Verification Dossier'. If electrical works are required to be carried out in a defined hazardous location, such as an inspection, maintenance or replacement of electrical equipment, the occupier (owner) must make available a Hazardous Area Dossier to the worker at the time of inspection or works.

AS/NZS 60079.17 and AS/NZS 60079.14, both state in part that, 'It is necessary to ensure that any installation complies with the appropriate documents, this standard and any other requirements specific to the plant on which the installation takes place.' A verification dossier is one such document which details compliance and has to be kept on the premises at all times. It is the responsibility of the occupier to ensure that the relevant information is produced, but it is recognised that the preparation of the document may be delegated to others.

A Dossier contains Hazardous Area Drawing, Log Sheet, List of AS/NZS 60079 standards and requirements, inspection report, list of equipment on site with certificate numbers, individual Equipment Device Report. Certificates can be stored in the dossier or on the system drive which would be referenced in the dossier.

Dossier Update Program

AusNet Services have approximately 225 sites with SCADA components installed and are classified as Hazardous Areas. These existing SCADA sites are in either confined spaces underground pit or above ground compounds and according to AS/NZS 60079 Standards for Hazardous Areas, all sites must have a compliant Dossier available essential for their operation including asset inspections and maintenance. These Dossiers must also be kept up to date with any additions to site equipment added to the Dossier.

All current SCADA sites installed since the early 2000's have dossiers available. However, a total of 170 sites currently contain outdated and non-standardised dossiers information impacting SCADA asset maintenance as well as being non-compliant with AS/NZS 60079 Standards. Therefore, updating all outdated dossier at existing SCADA sites including missing certificates, inspection reports, lists is required to comply with AS/NZS 60079 Standards and provide more effective SCADA maintenance activities.

Strategy:

- ***Progressively update all non-compliant SCADA site dossiers.***

5.6. Improved Pressure Data Capture and Monitoring

Current Winter Testing Digital Recorder

AusNet Services' gas network currently utilise digital pressure data loggers called "Blue Crystals" as part of the Winter Testing program and ad-hoc pressure data capturing for individuals pressure issues. These data recorders are collated at the end of a 2-week data recording and sent back to the Gas Network Planning team for analysis. However, these digital recorder devices have significant limitations as they operate in a stand-alone mode, recording data only locally on a memory card for a fixed period of time typically 2 weeks, hence requiring data to be downloaded offline by re-collecting each unit in the field. This service costs in total approximately on average $50,000 per annum.

Reliable network information is crucial as it is the key source for defining the annual augmentation program. The current process has significant limitations in accessibility and flexibility of critical network information and insights collection of network pressure data required for network analysis and modelling.

Network Planning has identified the replacement of pressure recorders as a crucial step in achieving more accurate network models for Winter Testing and Analysis. This ensures that prudent and sustainable investment in the delivery of the augmentation program.

Background

In order to improve the data from Winter Testing, approximately 20 remote pressure data loggers were purchased and installed within the gas networks utilising 4G telecommunications network to transmit network pressure data directly over 4G connection on a daily basis. These devices have been successful providing remote network performance information since their installation in early 2021 and have been used for effective network performance monitoring and analysis throughout the year without requiring the need to re-collect each device to download the pressure data recorded for only a fixed 2-week periods in a year.

Remote Pressure Logger Program

AusNet Services currently manages a total of over 80 gas distribution networks requiring winter testing program progressively completed over a 5-year period and installation of remote pressure loggers will enable for improvements in network performance analysis and winter testing program requirements. An analysis of network has identified 25 most critical locations in the highest growth rate corridors including Hume, Rockbank, Werribee, and Ballarat requiring remote pressure loggers to ensure for efficient data collection and analysis of network performance for planned winter testing program.

Strategy:

- ***Progressively roll out remote pressure recorders.***

6. Alignment with Network Objectives

This section provides an overview of the alignment of the programs proposed in the SCADA Strategy with the gas network objectives which govern how the network is operated and maintained.

See Section **Error! Reference source not found.** for detail on AusNet Services' gas network objectives.

Table 2: Alignment of SCADA Strategies with Gas Network Objectives

PROGRAMS	GAS NETWORK OBJECTIVE			
	Maintain Network Safety	Maintain Operating Efficiency	Undertake Prudent & Sustainable investment	Deliver Valued Services to Customers
Fringe RTU Installation / Relocation	X	X	X	X
End of Life Replacement	X		X	
Slam Shut Switch Replacement	X	X	X	
Temperature Transmitter Replacement	X	X	X	
Dossier Upgrade	X	X	X	
Improved Pressure Data Capture and Maintenance	X	X	X	

Gas Network Objectives
Maintain network safety in accordance with the Gas Safety Case; • The proactive replacement of end of life of equipment reduces the possibility of asset failure, reducing the risk from a potentially unsafe environment. • The implementation of safety related programs prevent injury of personnel working on site and minimises the risk of downstream failure. • The Hazardous Area Dossier Update program ensures critical safety information is updated and compliant with AS/NZS 60079. *Maintain top quartile operating efficiency;* • Installing remote pressure loggers and RTU sites ensures that decisions regarding network reinforcement are being made with accurate data. *Undertake prudent and sustainable network investment;* • Installation of fringe RTU's allows long term trending analysis to be performed which assists in determining the appropriate timing of network reinforcements. • End of life replacement eliminates assets that are expensive and difficult to maintain. • The implementation of safety related programs are considered prudent investment to the network. *Deliver valued services to customers;* • Installation of fringe RTU's gives visibility at network extremities and allows the controller to detect and act to avoid excessive pressure drops, which can impact on supply reliability to the customer.

7. Scopes of Work

7.1. Phasing and Financial Disclosure

All programs are defined in Australian financial years, aligning to regulatory years from July until June of the ensuing year.

All financial figures quoted within this document, including all historic and forecasted expenditure - unless otherwise specifically stated – have the following characteristics:

- Real Expenditure / Cost (reference year = 2022);
- Direct Expenditure only (i.e. excludes overheads and corporate finance costs); and
- In units of $1,000 (i.e. '000).

7.2. Fringe RTU Installation / Relocation

Table 4: Fringe RTU Installation

YEAR	SUBURB	LOCATION	TYPE	COST ESTIMATE ($'000)
		[C.I.C]		

Table 5: Fringe RTU Relocation

YEAR	SUBURB	LOCATION	TYPE	COST ESTIMATE ($'000)
		[C.I.C]		

7.3. PC-1 Replacement

Table 6: PC-1 Replacements

YEAR	SITE	NAME	SUBURB	COST ESTIMATE ($'000)
		[C.I.C]		

	[C.I.C]			

7.4. Temperature Transmitter Replacement

Table 7: Temperature Transmitter Replacements

YEAR	SITE	UNIT NO.	TYPE	COST ESTIMATE ($'000)
		[C.I.C]		

7.5. Hazardous Area Dossier Update

Table 8: Dossier Updates

YEAR	SITE	NAME	SUBURB	COST ESTIMATE ($'000)
		[C.I.C]		

[C.I.C]

[C.I.C]

		[C.I.C]		

7.6. Slam Shut Switch Replacement

Table 9: Slam Shut Switch Replacements

YEAR	REGULATOR NUMBER	SITE	SUBURB	PRESSURE TIER	COST ESTIMATE ($'000)
		[C.I.C]			

		[C.I.C]			

7.7. RTU Cabinet Replacement

Table 10: RTU Cabinet Replacements

YEAR	SITE NO.	NAME	COST ESTIMATE ($'000)
		[C.I.C]	

7.8. Remote Pressure Monitoring Unit

Table 11: Remote Pressure Monitoring Units

PROGRAM	2023-24	2024-25	2025-26	2026-27	2027-28	2024-28 TOTAL
		[C.I.C]				

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