APA Group

APT ALLGAS ENERGY PTY LTD NETWORKS TECHNICAL ASSET MANAGEMENT PLAN

Version 0.7

20 September 2010

This APM has been compiled by Asset Strategy & Planning Group in consultation with Operational Management of Allgas Networks.

Approved by

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Amendment Record

Version	Date	Changes Made	By
0.1	22 Dec 09	Initial draft	DTP
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0.3	19 May 2010	Updated in line with feedback from JRK	DTP
0.4	June 2010	Updated in line with additional information on CAPEX & OPEX scope of work	DTP
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0.6	17 September 2010	Update to include 2009-10 data and finalised project data	DTP
0.7	20 September 2010	Included changes related to latest versions of Strategic Capacity Management Plan and Mains Replacement Strategic Plan.	Stevan Gajinov

Reference Documents

Version	Date	Title	File Location
5	7 April 2010	Safety and Operating Plan for APA Queensland Networks April 2010.doc	H:\P Drive Contents\David Payne\Strategic Asset Management\AMP\Asset Management Plans
3	31 March 2010	SAOP for APT Allgas Classified Pipelines. April 2010.doc	
8	9 February 2010	APA Group Queensland Networks Emergency Response Plan Rev 8.doc	
6	13 August 2009	Meter Measurements Scheme Release 6.doc	
4	18 December 2009	Queensland Networks BRMP 09-2010 Rev 4.doc	
1	19 October 2010	APA Group Network Performance Report 01-06.09.doc	
1	5 November 2008	Queensland Gas Networks Risk Assessment.doc	
4	19 August 2008	Queensland Odorising Manual.doc	
		Network Load Growth Forecast Plan	APA Queensland Networks Marketing Group
0.3	16 September 2010	Capacity Management Strategic Plan	Stevan Gajinov
0.5	16 September 2010	Mains Replacement Strategic Plan	Stevan Gajinov

PREFACE

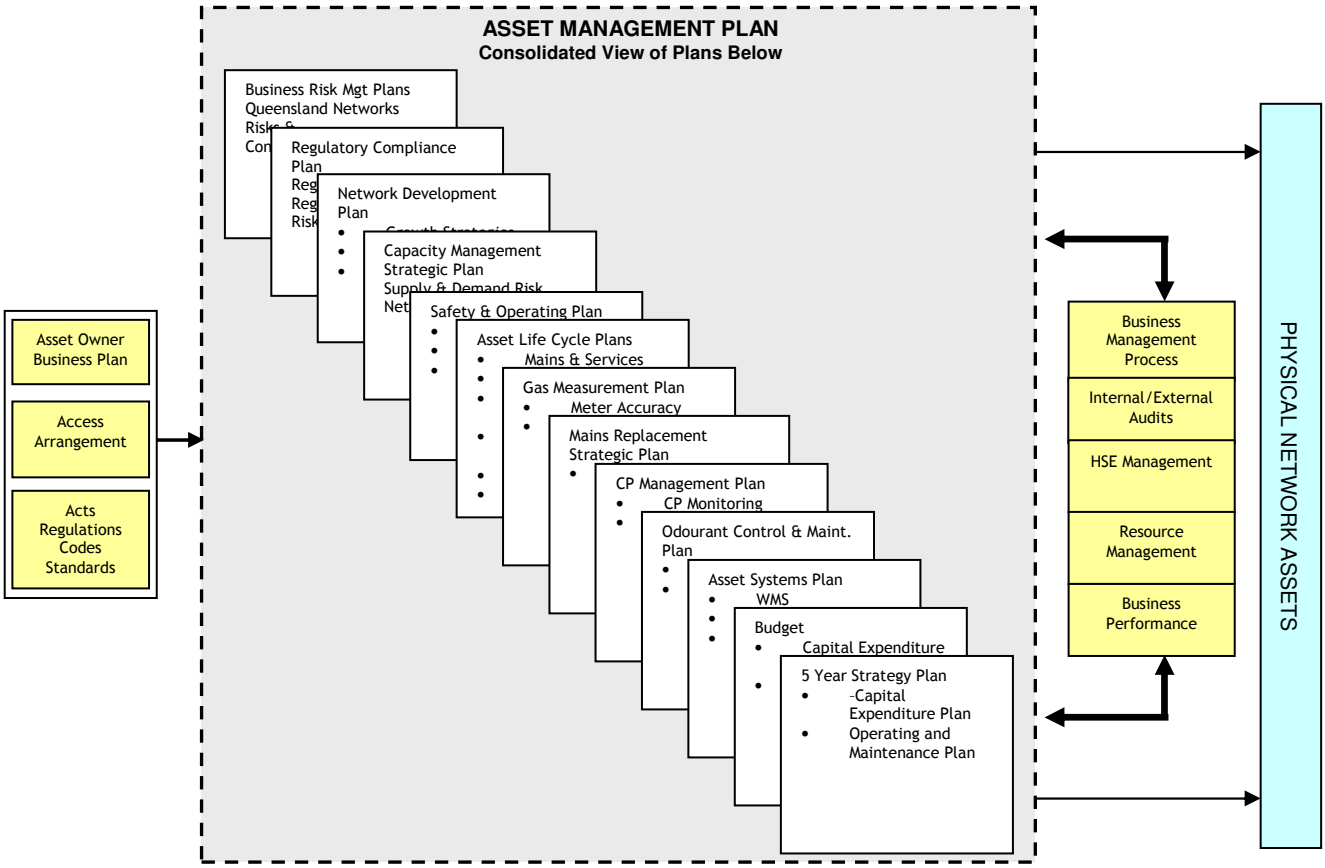
This Asset Management Plan (AMP) provides a consolidated view of a number of technical and operational plans and how these are used to drive asset management strategies and expenditure to ensure safe, reliable and sustainable supply of gas in line with:

- Legislative obligations
- Effective risk management
- Financial business parameters
- Lowest lifecycle costs
- Extraction of maximum value from assets

This AMP is underpinned by the following associated plans:

1. Business Risk Management Plan
2. Safety Management Plan
3. Network Load Growth Forecast Plan
4. Capacity Management Strategic Plan
5. Mains Replacement Strategic Plan
6. Meter Measurement Scheme Version 6 for the APT Allgas Networks

Key issues and actions from these plans have been summarised and detailed in this AMP.



The AMP is structured into 7 Sections:

Section 1 – General

Purpose, scope, organisation structure, asset management policy.

Section 2 – Key Asset Performance & Service

Overall summary of network performance, condition and levels of service.

Section 3 – Network Overview

Overview of the physical network covered by this plan, performance objectives and key asset drivers.

Section 4 – Network Management Plans Overview

Overview of key regulatory, technical and operational plans supporting this AMP.

Section 5 – Asset Life Cycle Plans

Overview of asset lifecycle issues, risks and recommended actions.

Section 6 – CAPEX OPEX Summary

Summary of: growth and replacement volumes; augmentation and other stay in business (SIB) projects.

Section 7 – Project Proposals

Detailed project proposals/business cases.

SECTION 1 - GENERAL

1.1 Purpose & Objectives

The purpose of this AMP is to demonstrate how the APA Group develops and maintains its gas infrastructure assets in a prudent and sustainable manner. The AMP consolidates in one document the full asset life cycle processes and practices used to ensure optimal asset outcomes.

This plan:

1. Demonstrates to key stakeholders that the APA Group asset management approach is prudent, delivering long term sustainability, addressing an appropriate balance between service levels, performance, cost and risk.
2. Provides the technical basis to support the APA Group's network expenditure in Queensland.
3. Provides the basis for continuous improvement of asset management lifecycle management.

1.2 Scope

This AMP covers the asset lifecycle of the APT Allgas Energy Pty Limited regulated gas network assets within Queensland and Northern New South Wales.

The lifecycle of assets relates to the cycle of planning, creating, operating and maintaining assets throughout their period of service, through to their replacement or removal from service.

The network assets covered by this plan include:

1. High Pressure Mains
2. Distribution Mains and Services
3. Gate Stations
4. Pressure Regulating & Valve Installations
5. Consumer Metering Installations
6. Odorant Facilities
7. Network Monitoring & Control (SCADA) Facilities

This plan also covers the strategic plan for the computer based Asset Information System supporting the lifecycle management of network assets.

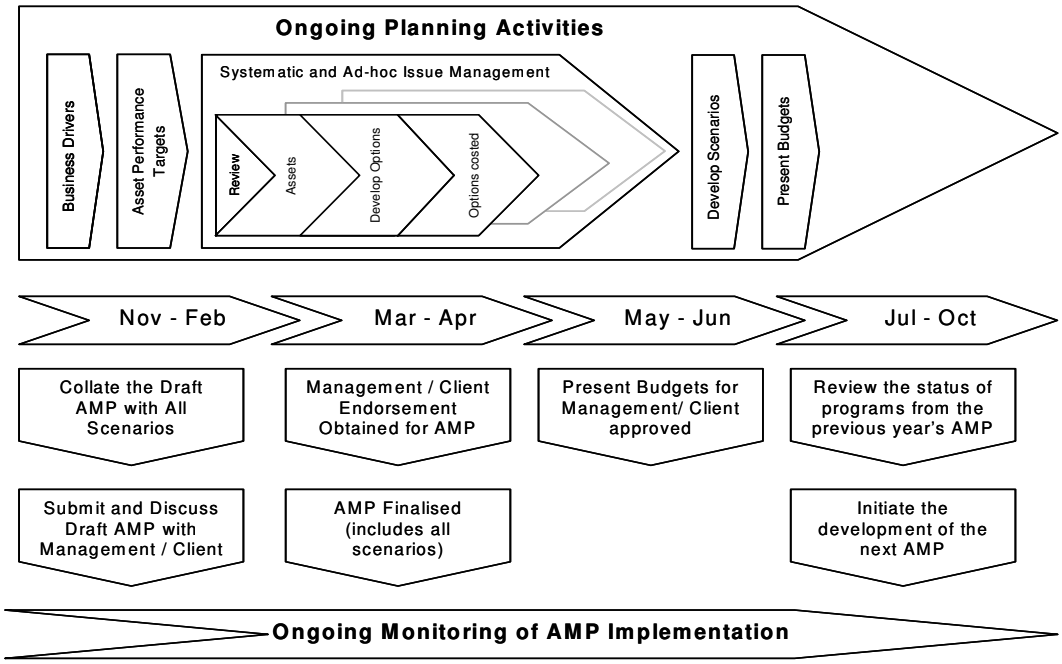
1.3 Plan Development & Planning Cycle

The development of AMP is a year round process with two parallel streams.

The first stream involves the ongoing monitoring of asset performance and implementation of the previous year's AMP.

The second stream involves the review of asset performance, risks, development of technical solutions, development of budgets and securing approvals from APA Management and Envestra.

This process is based on a 5 year planning horizon with Yr 1 covering tactical initiatives for the following financial year with years 1-5 providing the basis for the strategic planning.



Asset Management Plan development and Planning Activities cycle. Time-line based on standard July – June Financial Year, it can be adjusted to contract requirements.

1.4 APA Group Network Operations

APT Allgas Energy Pty Ltd is the holder of the Area Distribution Authority issued by the Queensland Department of Mines & Energy for all APA Group natural gas assets in Queensland and has the Reticulator's Authorisation for Northern New South Wales. APA Group through the APT Operation & Maintenance Services (APT O&M S) group known as Queensland Networks operates and maintains its Queensland and Northern New South Wales gas infrastructure assets, including extension projects that provide natural gas to new areas.

APT O&MS must comply with "all applicable laws, all authorisations, the Access Code, and any determination of any regulator….." In effect APT O&MS is responsible for all aspects of the operation and management of the networks.

1.5 Key Stakeholders

The AMP is required to address the different requirements of the key stakeholders that have a vested interest in the management of the assets.

• APA Group	Owner of the network assets
• APA Queensland Networks	Asset Manager
• APA Unit Holders	Investors of capital into the assets
• Australian Energy Regulator	Economic regulator of the assets
• Retailers and consumers	Users of the services provided by the asset
• Department of Mines & Energy (DME)	Regulator of Qld gas infrastructure
• Department of Water and Energy (DWE)	Regulator of NSW gas infrastructure

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

APA Group - as owners of the assets, APA adopt appropriate asset management practices based on regulatory obligations, accepted industry codes and standards, consistent with those of a prudent network operator, and ensure that the network assets are managed in a safe, efficient and economic manner.

APA Queensland Networks - as the entity responsible for the day-to-day operation and management of the network assets, is required to ensure that APA Group's requirements as described above are fulfilled.

APA Unit Holders - require that appropriate investment and asset management decisions are taken to ensure the integrity of their capital investment.

Australian Energy Regulator (AER) - requires economically efficient operating costs and seeks to ensure that network charges are reflective of prudent capital investment; requires compliance national codes and guidelines.

Retailers and Consumers – require that a safe, secure and reliable supply of gas can be provided at a reasonable cost, and a high level of service is delivered in response to gas supply problems and associated issues.

Queensland Department of Mines and Energy (DME) – are responsible for licensing for gas distribution as legislated under the Gas Supply Act 2003, and require that all

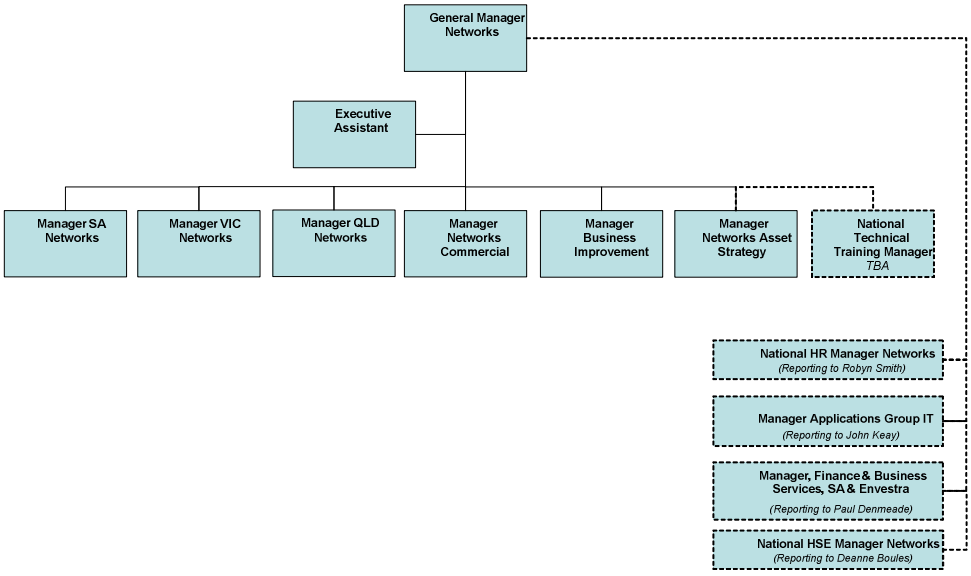
pipeline activities are licensed and all pipeline and gas distribution systems comply with relevant Acts, Regulations and Codes.

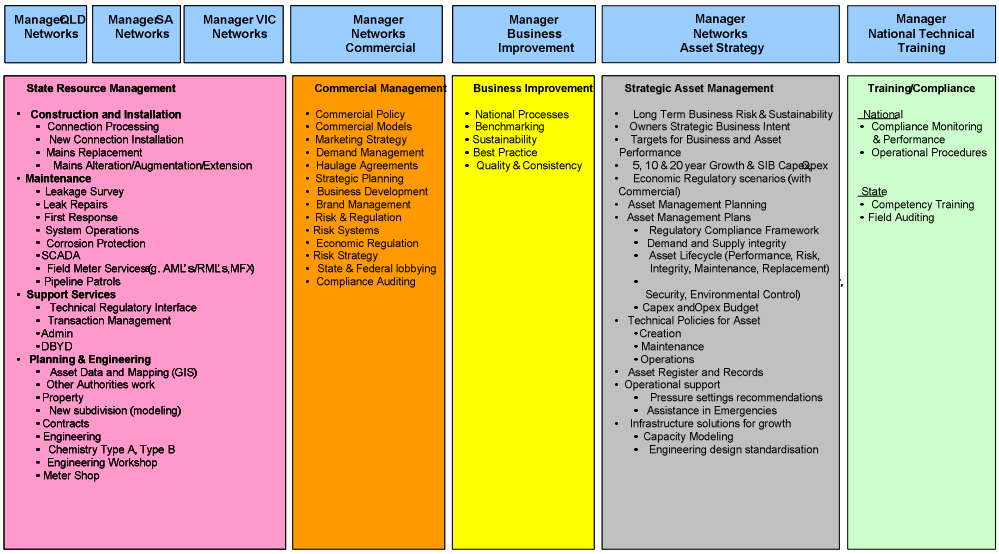
New South Wales Department of Water & Energy (DWE) – as technical regulator of the assets, the DWE issues authorities for the distribution of reticulated processed natural gas in New South Wales as legislated under the Gas Supply Act 1996. DWE requires that all pipelines and gas distribution systems comply with relevant Acts, Regulations and Codes.

1.6 Organisation

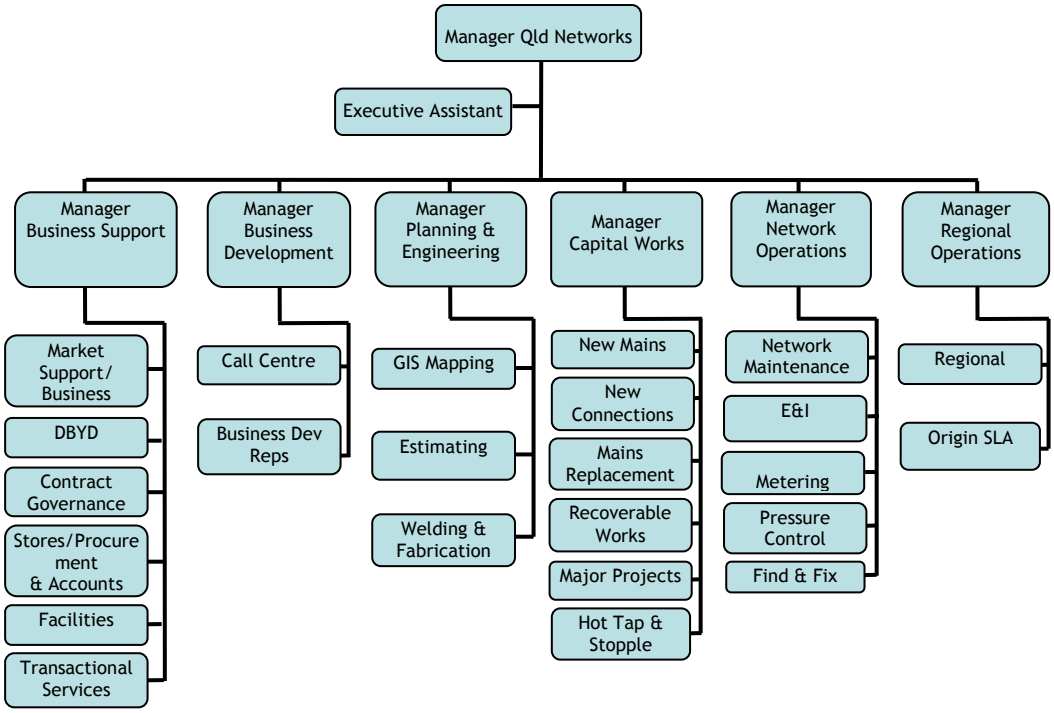
1.6.1 APT O&M Services

APA manages the network and is responsible for the safety, reliability and integrity of the network. The key positions and functions of the APA organisation are highlighted below.





Queensland Networks – Key Personnel and Areas of Responsibility



1.7 Risk Management

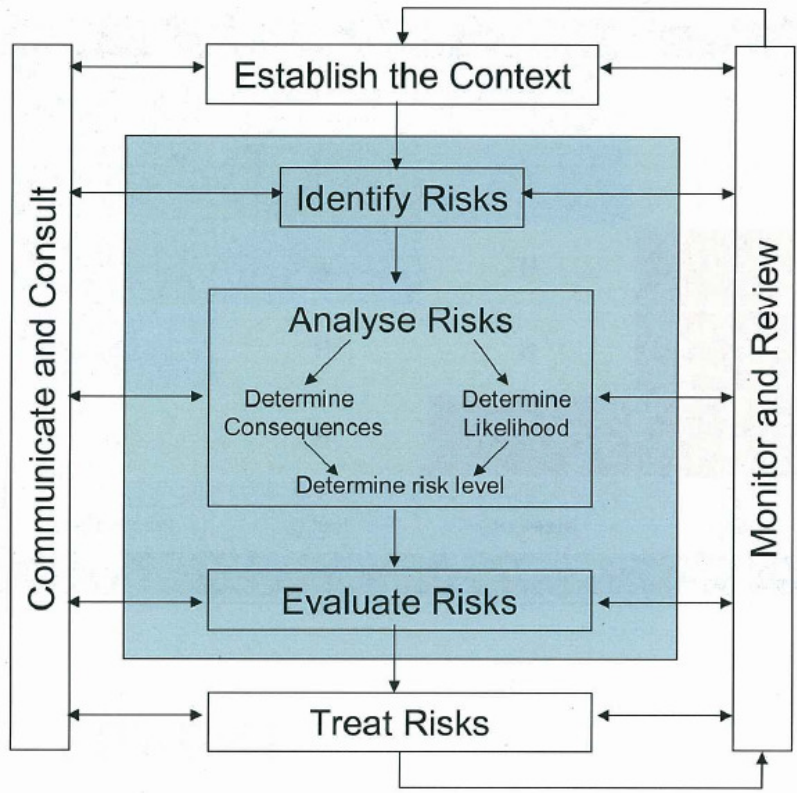
APA Group has adopted a formalised and systematic approach to risk management.

This risk management system recognises that some element of risk will always be present within the business. The aim is to eliminate risk where practicable, or alternatively put in place processes and procedures to control and or minimise the consequences.

The process of Risk Analysis within the APT Allgas Energy networks involves identification of risks and evaluating likelihood and consequence referencing risk management protocols outlined in:

1. APA Group Risk Management Policy
2. AS/NZS 4360 – Risk Management
3. AS2885 – Pipelines Gas & Liquid Petroleum
4. AS 4645.1:2008 Gas Distribution Networks – Network Management
5. AS 4645.2:2008 Gas Distribution Networks – Steel Pipe Systems
6. AS 4645.3:2008 Gas Distribution Networks – Plastic Pipe Systems

The risk management process is summarised in the following diagram:


Establish the Context
Identify Risks
Analyse Risks
Determine Consequences
Determine Likelihood
Determine risk level
Evaluate Risks
Treat Risks
Communicate and Consult
Monitor and Review

Risks are evaluated against APA's risk matrix detailed below.

	Typical Severity Class		Minor	Moderate	Severe	Major	Catastrophic
CONSEQUENCE	Health &Safety		Single - no permanent injury Lost time injury	Multiple - no permanent injury	Hospitalisation Single permanent injury	Single fatality Multiple permanent injury	Multiple fatalities
	Financial Impact		Less than $1M Change to Project Budget	$1M - $5M Change to Business Unit Budget	$5 - $20M Financial explanation to Market Regulators	$20 - $50M Change to strategy due to Cash Flow constraints	$50M + Cash Flow crisis Credit Rating downgraded
	Customer & Business Interruption		Short term localised service interruptions to less than 100 customers / day Parameters not met to1 contract customer	Short term localised service interruptions to less than 1000 tariff customers / day or 1 contract customer	Loss of service to less than 10000 tariff customers / day, or few contract customers	Short term loss of service to more than 10000 customers / day Area growth affected	Long term loss of service to mass market (>100000 customers /weeks). Viability of Company in doubt
	Environment		Localised incident immediately contained	Localised damage immediately contained. Reportable - no financial penalty	Serious short term impact to ecosystem Reportable - financial penalty	Serious long term impact to ecosystem Reportable - prosecution	Wide area - long term affected Reportable - potential lost of licence
	Compliance & Legal		Technical non-compliance with statutory, licence, regulations. Voluntary explanation to Regulator	Non- compliance with statutory, licence, regulations. Compulsory explanation to Regulator	Non-compliance with statutory, licence, regulations New conditions to Licence manageable	Non-compliance with statutory, licence, regulations New conditions to Licence affecting ability to operate	Non-compliance with statutory, licence, regulations. Loss of Licence. Significant financial penalty Prosecution
	Reputation		Isolated localised public complaints	Adverse comments in local media Public statement required	Adverse comments in State media Widespread concern from investors, customers and regulators	Adverse coverage in National media. Customers and investors question company reliability	Prolong adverse coverage in national/ international media. Significant impact on shareholder value
LIKELIHOOD	Almost Certain	Expected in most circumstances, At least once per year or more	Moderate 11	High 16	Extreme 20	Extreme 23	Extreme 25
	Likely	Will occur in most circumstances At least once every 3 years	Moderate 07	High 12	High 17	Extreme 21	Extreme 24
	Possible	Might occur at some time At least once every 10 years	Low 04	Moderate 08	High 13	Extreme 18	Extreme 22
	Unlikely	Could occur at some time At least once every 25 years	Low 02	Low 05	Moderate 09	High 14	Extreme 19
	Rare	May occur only in exceptional circumstances Less than once every 25 years	Low 01	Low 03	Moderate 06	Moderate 10	High 15

Any risk issues deemed to have an extreme or high risk rating are actioned on a priority basis to either remove the cause of the risk and/or apply additional controls to reduce the risk rating to an acceptable level. Items having a risk rating of Moderate are documented and actioned in accordance with available resources and other priority actions, whilst items rated as Low risk receive the lowest priority or may be accepted and monitored without further treatment.

Priority		Priority Description
Priority 1		Any project, where Risk Level of at least one risk area falls into Extreme must be included in Priority 1. These projects should be regarded as non-discretionary, as their justification is to mitigate the risk level that is not acceptable to APA.
Priority 2		Any project, where Risk Level of at least one risk area falls into High must be included in Priority 2. The non inclusion of these projects may expose APA, or third party asset owner to potential short and long-term business damage.
Priority 3		Any project, where Risk Level of at least one risk area falls into Moderate must be included in Priority 3. The non inclusion of these projects may affect reliability of assets; as well it may affect operating efficiency and compliance.
Priority 4		Any project, where Risk Level of at least one risk area falls into Low must be included in Priority 4. The non inclusion of these projects may affect opportunity for overall company risk reduction and operating efficiencies.

1.8 Audit, Monitoring & Review

Effective asset management requires the gathering of a wide range of information to ensure sound management decisions are made. Information is gathered through a range of audit, monitoring, reporting and review functions essential for the day-to-day operation and maintenance activities and to ensure the organisation has and maintains the required asset management processes, knowledge and expertise in the longer term.

Management is charged with ensuring that the network is operated and maintained to required levels of safety, reliability and sustainability with processes continuously improved and optimised.

The key inputs are:

Monitoring/Reporting Processes

- Operational and KPI reporting
- Expenditure against budget

Review Processes

- Asset condition and KPI trends
- Training needs/Skills and competencies assessments
- Site & activity management planning
- Procedural controls / operating manuals
- Records management processes

Audit Processes

- Internal audits
- External audits

1.8.1 Audit Processes

Auditing processes are to ensure that all activities and processes comply with required industry standards.

The results of both internal and external auditing are reported to management.

1.8.2 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 may be categorised as compliance reports, operational reports, exception reports and financial reports. 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 6 monthly for the APA Group Board and audit committee.
- **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 Networks, 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 control.

- **HSE committee reports** are produced by each operating unit to keep all staff informed of the issues that affect their area of operation and control.

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, notice boards etc.

Budget planning and monitoring is undertaken to ensure planned work is performed efficiently and within economic constraints. Detailed budgets are prepared annually and monitored on a monthly basis. Budget forecasts are prepared based on a review of activities and forecast changes in growth and other environmental and economic factors. Budgets are based on a detailed review of the work to be undertaken to operate and maintain the network to manage the business and to construct the required extensions, augmentation and replacement of network assets.

Regulatory Reporting – A safety report, an Area Distribution Authority report on the assets and the quantities of gas delivered and a Queensland Networks Metering Measurement Plan report are filed annually with the Queensland Department of Mines and Energy (DME), in accordance with the requirements of the Petroleum and Gas (Production and Safety) Act 2004. Similar annual reports are sent to the New South Wales Department of Water and Energy (DWE). These legislative requirements prescribe various operation reports covering:

- Promptness of Connection
- Network Extension & Expansion Charges
- Planned Interruptions
- Major Interruptions
- Statistical Information
- Technical Information
- Complaints
- Key performance indicators
- Safety of an "Operating Plant"

1.8.3 Measuring Network Reliability

The reliability of the APT Allgas network is continually monitored and assessed from the perspective of the performance of the assets and the impact on consumers.

Performance of Assets - APA continually monitors the performance of the distribution network in Queensland utilising a number of systems and has a number of Key Performance Indicators which are tracked, monitored and reported on. An annual Distribution System Performance Review (DSPR) is undertaken covering system capacity, and integrity and network changes for the preceding calendar year.

Impact on Customers – The APA Group participates in the Ombudsman Scheme in Queensland which allows network customers to raise complaints in relation to network related service levels or procedures to the Energy Ombudsman Queensland as an independent authority, for follow up.

As part of its participation in the Ombudsman Scheme, the APA Group has developed a procedure to outline the process for handling network-related customer complaints in a

courteous, timely and effective manner. The Procedure has been prepared in accordance with Australian Standard 4269 (1995) 'Complaints Handling'.

All complaints are managed and resolved in accordance with the processes outlined in the complaints handling procedure.

A Complaints Tracking database has been established to monitor and report on complaints received.

1.8.4 Review Processes

Formal and informal reviews undertaken throughout the organisation form a vital input into the planning and management processes. These reviews provide the required level of details essential in balancing the many factors relating to the effective operation of network assets.

The following sections outline some of the main areas which are subject to review, the output being used to assist in planning and management decision making.

1.8.4.1 Asset Condition & KPI

The asset KPI's detailed in Section 5.1.4 are the primary measures of asset performance. For each asset group, specific data is collected and KPI's derived for analysis and review. The output of this process assists in determining the most appropriate course of action.

The formal mechanism to monitor and review KPI trends and asset performance measures is the APA Monthly Operating and Management Report, which contains all KPI data for the current month and year-to-date reporting periods. These reports are reviewed by APA to facilitate improved day-to-day asset management decision-making such as the decision to maintain or replace assets. These same measures are used to monitor underlying condition and trends that may affect the network's performance over the longer term. Generally, gas distribution networks are fairly stable with well established underlying trends allowing corrective actions or required changes to be planned well in advance.

1.8.4.2 Skills and Competencies

Skills and competencies of staff and contractors are viewed as critical in the effective management of the assets.

Processes are in place to ensure that only those staff members and contractors that possess the relevant competency are able to perform tasks without direct supervision.

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 periodically to ensure that competence is maintained and to provide an opportunity to assess the effectiveness of training. This process of operator licensing provides the business with confidence that strict controls are implemented for critical activities.

The APA Queensland Networks Competency Matrix flags when a competency requires reassessment and/or refresher training.

1.8.4.3 Business Risk Management Planning

A "risk based" approach to managing the business ensures that key risks to the business have been identified and adequately controlled, and that resources are utilised for the greatest benefit. The business has been divided into a number of sites and activities to enable management plans to focus on the area of functional control. Each site and activity has been assigned to a person with overall responsibility for managing the risk based process, and this person is accountable for ensuring the effectiveness and ongoing improvement of the systems therein.

A Business Risk Management Plan (BRMP) has been developed following a business risk assessment, conducted in a collaborative approach by staff.

The business risk assessment process provides a framework to:

- Identify the key risks, likelihood and effect.
- Assess the effectiveness of current controls for those risks.
- Develop action plans for improving the effectiveness of risk controls in each site or activity.
- Provide a sound basis for developing and improving risk management plans for each site or activity, and the implementation of audit and inspection findings.

Business Risk Management Plans support the business risk assessments, and ensure that critical controls are identified and appropriately managed. The BRMP's are pivotal in the control of the business activity and provide the input to continuous improvement and optimisation processes.

Measures of performance and outcomes, assigned to key controls, are continuously assessed to ensure that principal risks are managed to acceptable levels. To enable this a Risk Management KPI Report is submitted to management each month.

1.8.4.4 Procedural Controls / Operating Manuals

A program has been established to ensure that key conceptual design, construction, operational, maintenance and replacement knowledge is documented in an appropriately indexed and controlled format to enable effective retrieval.

Intellectual knowledge documentation forms the basis of skill and competency development in future generations involved in the management of the assets through:

- **Procedures** describing what outcomes are expected from the process.
- **Work instructions** stepping through and explaining how the outcome is to be achieved.
- **Competency standards** capturing the key skills required of an operator performing the function.
- **Training programs** which are developed to address the training needs required to meet the competency standards. Such programs are flexible in delivery and content, and developed to meet the needs of participants.

Document control measures ensure that only certified and approved procedures and work instructions are made available to relevant field or operational personnel. These documents are reviewed on a scheduled basis, however where need for significant change is identified, a special review is instigated. Such reviews are formally documented and appropriate change management controls implemented.

1.8.4.5 Record Management Processes

Record management processes ensure that pertinent historical data is stored as evidence that those systems conform to requirements. Records are stored in such a way that they remain legible over time, readily identifiable and retrievable. Management processes ensure that record controls address the identification, storage, protection, retrieval, retention time and disposal of records.

Depending on the type, records may be stored as hard copy, electronically or both. Hard copy records are managed in appropriately controlled filing systems that are suitably protected, while electronic records are controlled by networked databases.

1.9 Key Asset Management Drivers

This section of the AMP describes the factors that influence the extension, replacement, modification and or refurbishment of network assets.

1.9.1 Network Growth

On-going growth drives expansion of the network into new areas as well as reinforcement of existing networks through either upgrade of pressures and or the installation of additional mains and links between mains.

It is expected that Allgas will be connecting additional 3000 (+/- 500) new customers every year as continuation of last years profile. The majority of new connection will be for houses build in new estates, giving rise to additional network mains, services and new meters. On going marketing of natural gas is aimed at maintaining the existing customer base as well as growing the use of gas.

1.9.2 Mains Asset Condition

A significant component of the APT Allgas OPEX relates to locating and repairing leaks and UAFG associated with the old Cast Iron & Unprotected Steel (CI & UPS) mains and services.

The annual costs attributed to repairing leaks are $2.63M and the overall annual cost for unaccounted for gas is currently $2.6M. As supply losses due the condition of the mains is primarily dependant upon the weather (i.e. Water Ingress activities) and wet weather in Queensland is erratic, the costs attributed to this item are not currently isolated from general maintenance costs.

Leaks from the CI mains are predominantly from mechanical joints, a legacy of the dry nature of natural gas compared to the “wet” reformed gas used when these assets were first installed. In areas where CI mains have been laid in clay, the acidic nature of these soils leads to graphitisation resulting in brittle fracture and in some instances sections of the main “blowing out” during maintenance.

Leaks from UPS mains are due to external corrosion of the pipe. These mains were installed without any external protective coating or cathodic protection. Invariably the first call to a leak problem here reveals quite extensive pitting corrosion along the pipe length with replacement rather than repair the best option.

1.9.3 Supply Risk Management

The review of supply risk within gas networks is an ongoing process to ensure a safe and reliable supply of gas is maintained.

Improving security of supply requires either additional mains, regulators, surveillance equipment or changes to operational and maintenance procedures.

1.9.4 Meter Replacement

As part of the Queensland Networks Meter Measurement Scheme – Release 6, domestic meters are required to be replaced at the end of their nominated "technical" life or a sample tested to extend the field life of the representative family of meters. This requirement gives rise to approximately 1,000 to 2,000 periodic meter replacements per annum.

1.9.5 Third Party Works Programmes

South East Queensland is currently undergoing extensive civil infrastructure upgrade/expansion works requiring the need to move, modify or relocate existing gas assets in addition to ongoing capital works programs by other authorities operating and maintaining assets in the public domain which may also require, from time to time, gas assets to be moved, modified and or replaced.

1.9.6 Network Risk Reviews

Reviews of quality, productivity, service delivery and network integrity issues invariably highlight a risk to the business that needs to be eliminated or controlled. These issues, in part have been a legacy of past practices and higher standards and controls mandated in the current environment.

1.10 Asset Performance Objectives

1.10.1 Transmission & Distribution Networks

1.10.1.1 Capacity

1. Networks have sufficient capacity to meet a peak hour demand.
2. Network extremity pressures are maintained above recommended minimum values.

1.10.1.2 Network Integrity

1. The total leaks reported per km of installed main reduce over time.
2. The amount of UAFG (rolling 12 month GJ's) is reduces over time.
3. The numbers of third party damages per km of mains reduces over time.
4. No third party damage incidents on transmission supply mains result in interruption to supply.

1.10.2 Pressure Regulation Installations

1. Networks do not exceed their maximum allowable operating pressure (MAOP).
2. Pressures are controlled and maintained in accordance with nominated supply pressures to avoid loss of supply within the distribution network.

1.10.3 Metering

1. Metering accuracies are maintained within tolerances specified in the Queensland Networks Meter Measurement Scheme – Release 6 for the APT Allgas networks
2. Timeframes for installation, upgrading and maintenance (to restore accuracy) to be in accordance with the requirements as defined in the Queensland Networks Meter Measurement Scheme – Release 6.
3. The provision of metering data to be within the required timeframes in accordance to the Retail Market Rules.

1.10.4 SCADA Facilities

1. Sufficient remote pressure monitoring and control is in place to enable efficient planning and emergency response
2. Demand customer data is accurate, validated (estimated/substituted) and supplied in accordance to the Retail Market Rule Procedures.

1.10.5 Odorising Facilities

The odorant facilities will control injection of odorant such that odorant can be detected at levels defined in the Queensland Petroleum and Gas (Production & Safety) Act 2004 and NSW Gas Supply (Safety and Network Management) Regulation which states that the detectable odour level in the gas is required to be at 20% of the lower flammability level.

1.10.6 Asset Service Life

Network assets will be planned, designed, constructed, operated and maintained to maximise the asset useful life.

1.11 Planning Horizons

Rolling 5 year forecasts of expected expenditure for the business are maintained from which annual network Opex and Capex budgets are developed.

Requirements for the next year are based on latest performance of the network, asset condition, asset age, and forecast growth for the coming year.

As the Access Arrangement for the Queensland network is reviewed every 5 years and the degree to which APT Allgas Energy Pty Limited recovers its investment in the network is an important factor in relation to availability of funds, additional emphasis is placed at each review on identifying and quantifying funding requirements for the subsequent 5 years.

Cost benefit analysis of network extensions (domestic and I&C) and mains replacements are based on either a 10 or 20 year horizon.

1.12 Capital Expenditure Categories

Allgas classifies system capital expenditure based on purpose in categories as follows:

- **Customer initiated capital expenditure** is required to meet growth in customer numbers and demand;
- **Network augmentation capital expenditure** is required to maintain capacity to meet current customer demands and to provide additional capacity to meet future customer demands;
- **Network renewal capital expenditure** is necessary for renewal and replacement of ageing network assets and compliance requirements relating to safety and reliability.

Non-system capital expenditure is related to IT systems and softwares, motor vehicles and plant and equipment which are not part of the distribution network.

1.13 OPEX Categories

1.13.1 Stay in Business (SIB) OPEX

The assets are designed, constructed, operated and maintained to ensure that they will continue to meet the required service levels at efficient life-cycle cost.

The functionality and performance requirements of existing assets (and their components) are continually reviewed to reflect changing demands of services, conditions of assets, operational risks, technological opportunities for improvement and most of all, Asset Owners business strategies.

Potential SIB projects are identified via the lifecycle planning reviews, as a part of the Asset Management Plan.

SIB Projects are associated with different justification drivers:

- Efficiency improvements

  CAPEX - Asset Efficiency Improvements; consisting of projects that reduce operational costs.

  OPEX - Process Efficiency Improvements; consisting of projects that aim to modify the ways assets are being managed, hence improving business profitability.

The prioritisation of projects in this group is based on NPV calculations, with higher priority given to higher NPV returns.

- Risk Mitigation

  CAPEX - *Capacity Development;* consisting of projects that aim to improve reliability of contracted services. *Renewal and Upgrade;* consisting of projects that aim to maintain targeted levels of compliance, safety, reliability and "shine".

  OPEX - *Planning, Operating and Maintenance initiatives*; consisting of projects that aim to mitigate risk with no-Capex solutions.

Every project is analysed for untreated risk and residual risk, with ratings of Likelihood, and Consequence. Risk Level to be assigned based on the APA Risk Management Matrix.

SECTION 2 – ASSET PERFORMANCE & SERVICE

2.1 Introduction

This section summarises key asset performance & service levels associated with:

1. Supply Reliability
2. Asset Integrity
3. Gas Containment
4. Network Utilisation.

These primary indicators reflect outcome of asset management policies, processes and plans.

2.2 Supply Reliability & Quality

2.2.1 Gas Outages

The following Table summarise unplanned outages as reported annually.

	05/06	06/07	07/08	08/09	09/10
Unplanned Outages - Third Party & Internal	148	125	80	6*	5*
Customer Complaint - Poor Supply	29	15	2	7	51
Total	158	140	82	13	57

* Third Party damage Reports only – does not include all other causes.

Note that reports prior to 08/09 covered every single supply interruption. Changes to regulatory reporting, where only incidents involving 3rd parties are reported, in 08/09, have resulted in the significant reduction of reports over the last 2 years.

The unplanned outages and poor supply problems associated with ingress of water are expected to continue until the mains replacement program has eliminated the cast iron mains within the low pressure system.

2.2.2 Gas Quality

Gas is odorised at city gate stations so that it is distinctive and unpleasant, and is readily detectable at 20% of LEL. This gas quality criterion is the principal means by which leaks are detected without suitably calibrated instrumentation.

Over the last 12 months odorant levels have complied with regulatory requirements.

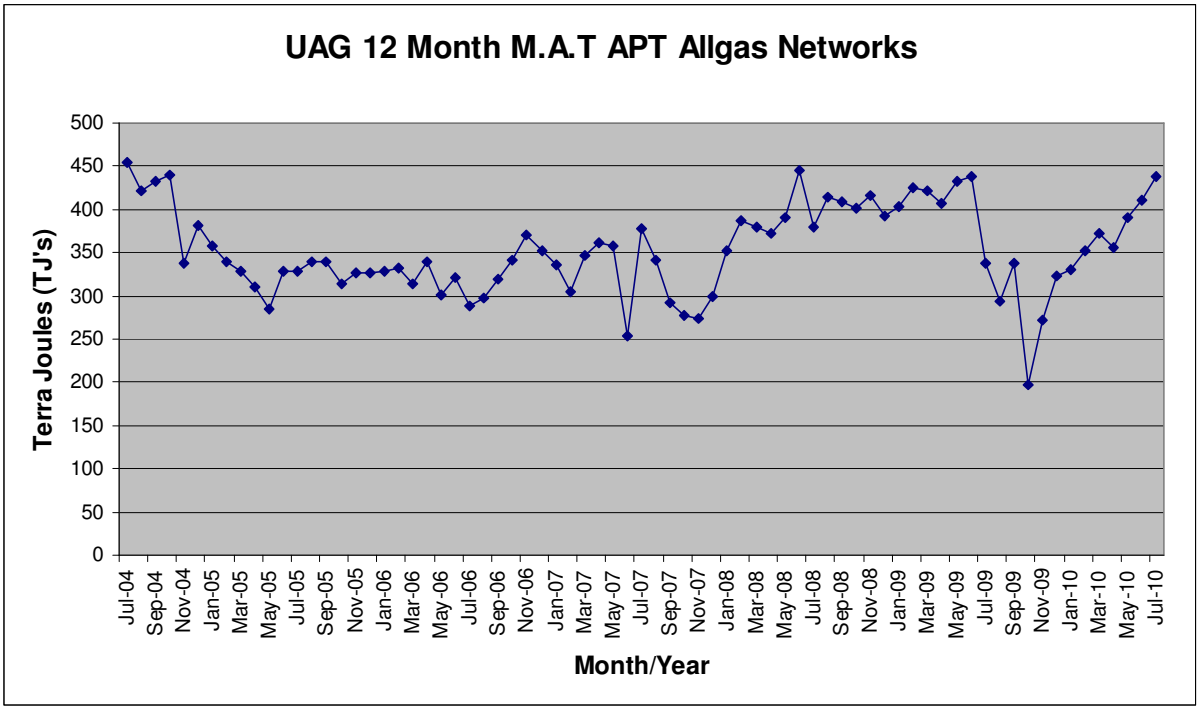
2.3 Asset Performance & Integrity

2.3.1 UAFG

At the time of writing this Plan, overall UAFG on APT Allgas Queensland gas distribution networks is 438 TJ, or 3.99% of injections at the gate stations. Actual UAFG varies widely, depending on location as can be seen in the table below.

District Network		2009						2010						
		Jul-	Aug-	Sep-	Oct-	Nov-	Dec-	Jan-	Feb-	Mar-	Apr-	May-	June-	July-
Brisbane and South Coast	TJ	266.8	249.7	295.8	177.8	248.5	296.6	303.7	325.4	343.9	328.7	363.1	388.5	418.0
	%	2.89%	2.71%	3.21%	1.93%	2.70%	3.21%	3.30%	3.54%	3.70%	3.51%	3.85%	4.09%	4.40%
Toowoomba	TJ	62.2	35.9	33.7	14.0	26.1	28.6	29.1	30.1	33.1	32.3	31.6	25.1	23.6
	%	5.11%	3.00%	2.83%	1.17%	2.19%	2.41%	2.50%	2.62%	2.93%	2.93%	2.95%	2.41%	2.34%
Oakey	TJ	16.1	14.0	7.8	5.0	-3.0	-2.5	-2.6	-3.3	-4.9	-5.7	-3.5	-2.9	-4.0
	%	5.23%	4.53%	2.52%	1.64%	-0.99%	-0.82%	-0.9%	-1.1%	-1.7%	-1.9%	-1.23%	-1.02%	-1.43%
Queensland	**TJ**	**345.1**	**299.6**	**337.2**	**196.8**	**271.6**	**322.7**	**330.2**	**352.2**	**372.2**	**355.3**	**391.2**	**410.7**	**437.7**
	%	**3.17%**	**2.76%**	**3.10%**	**1.81%**	**2.50%**	**2.96%**	**3.05%**	**3.26%**	**3.42%**	**3.25%**	**3.56%**	**3.74%**	**3.99%**

The chart below, gives an indication of how UAFG on the APT Allgas networks has varied over the previous six years.



There has been an increasing trend in UAFG from 2005 to 2009. Leaks from CI and UPS mains are considered to be contributing to the majority of the current UAFG. These mains are targeted for replacement over the next 10 years with UAFG expected to significantly drop from the current levels when all mains are finally replaced.

The reduction in UAFG during 2009 was associated with metering errors at some of large consumer sites. As errors have been identified and correction made UAFG is returning to levels observed during 2008. A dedicated resource has been proposed to be included in the next Access Submission to ensure errors associated with billing data and meter readings are identified and resolved in a timelier manner.

2.3.2 Distribution Network Leaks

The figures in the chart below show an overall total for the Queensland APT Allgas Networks. The Regional Networks are all relatively new polyethylene systems, with relatively small numbers of reported leakage, and therefore it is considered that these figures give a general indication of leaks/km of main within the older un-inserted Brisbane suburban networks.

For Year	05/06	06/07	07/08	08/09	09/10
Mains & Service Leaks	1,065	1290	1,295	1,360	2,657
M & S Leaks/km Main	0.45	0.53	0.55	0.57	1.1
Meter Leaks	1102	661	770	1,037	1,052
Total Number of Leak Reports	2167	1951	2.065	2,434	3,709
Overall Leaks/km Main	0.92	0.81	0.88	1.02	1.54

Mains and service leaks increased by 27% between 05/06 and 08/09 is considered to be because the CI & UPS mains replacement over this period had been insufficient to keep up with the deterioration in the network.

The 100% increase over the last year is considered to be because the special leak survey of the Toowoomba network that contains Philmac fittings used during the early years of insertion which are known to leak after several years of service plus the introduction of an aggressive smelling blended odourant in the Brisbane district.

An updated mains replacement strategy is proposed, maintaining the current rate of replacement to ensure sufficient mains replacement is undertaken for a controlled reduction of mains and service leaks over time.

The increase in meter leaks has been due to change in the odorant type that has more effective characteristics making gas leaks more detectible by the public. The move to a new odorant was driven by replacement of old “customised” odorant injector systems. The new equipment has enabled the use of a blended type odorant that is consistent with that used in APA’s other managed networks.

2.3.3 Metering Accuracy

Accurate measurements of gas received and delivered are critical in minimising the risk to APT Allgas’s revenue and service delivery obligations.

2.3.3.1 Consumer Metering Accuracy

All meters are tested for accuracy prior to installation and at 10 year intervals.

APA tests all meters removed as part of the "Meter In Test" programme. Domestic In-test are meters that have been brought in e.g. cut off and retested and sent out again. Queensland does not keep statistics of meters that have failed this test they are just repaired or condemned. These numbers are small in comparison to those tested.

Meters Repaired and Tested

For Year	2008/09	2009/10	2010/11
Meter changes	1319	1230	1740
Meters repaired	354	125	-
Meters in-tested	61	134	268

New meters

For Year	06/07	07/08	08/09	09/10
Domestic Meters	3060	3636	2718	2700
I&C < 10TJ	80	101	56	133
I&C > 10TJ	1	0	0	0

Results indicate that over 99% of domestic meters tested were within the APA Queensland Networks Meter Measurement Scheme accuracy requirements of +/- 2% accuracy.

2.3.3.2 Consumer Complaint and Billing

Consumers may request their meter to be tested. The process for consumer requests for meter testing is detailed in the Dispute Resolution Section of the Queensland Networks Meter Measurement Scheme.

The table below summarises consumer request for testing of meters.

For Year	07/08	08/09	09/10
Total Customer Meter Complaints	0	1	4
Meters Within Tolerance +/- 2%	0	1	4
Meters Outside Tolerance +/- 2%	0	0	0
Meters - Unable to Test	0	0	0

To date all of these tests show the meters to be accurate.

The number of requests for meter tests is extremely low compared to the total number of consumers (approximately 80,000). Statistically the figure is insignificant and there are no indications that will change in the future.

2.3.3.3 Gate Station Accuracy

The gate stations in Queensland are custody transfer stations and, in the majority, these are operated and maintained by both the APA Queensland Transmission and APA Queensland Networks with various limits of responsibility within each gate station. The Queensland Networks Meter Measurement Scheme – Revision 6 for APT Allgas specifies how often the measurement equipment will be tested for accuracy and flow computer validations are conducted as a joint venture between the up stream pipeline operator and APA networks.

The table below summarises the frequency of accuracy verification tests (AVT) for all of the sites in Queensland.

	Frequency	Billing Adjustments (last 12 mths)
Brisbane City Gate Stations	Quarterly	0
Regional Gate Stations	Every 6 Months	0
Custody Transfer Stations	Every 6 Months	0

Over the last 12 months there have been no material accuracy issues identified that necessitated billing adjustments and, as this has been the case for many years now, it is not anticipated that there will be any changes in terms of meter accuracy issues at City Gate Stations.

2.4 Emergency Management

2.4.1 Leak First Response

In accordance with the APA Group Leak Management Plan all public reported leaks are required to be attended to within 2 hours.

The target is for a compliance of greater than 95%.

Records of actual response times have been kept since June 2008 and are as per the following table.

	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10
% Response within 2 hrs	Max. Response Time KPI was 45 minutes			99%	89.2%	98%

2.4.2 Network Incidents

INCIDENT	2004-05	2005-06	2006/07	2007/08	2008/09	2009/10
3RD Party damage - MAINS	31	20	29	96	102	90
3RD Party damage -SERVICE	178	152	142	319	293	303
Gas in Building	0	0	0	0	1	0
Fire/Explosion	0	0	0	0	7	0

Prior to 2008/09 records of gas in buildings, fire and explosions had been kept in various disparate systems that make them difficult to retrieve and compare with the current computer based system. As such statistics have only been included since the new systems have come on line.

The “Gas in Building” incident shown in the 2008/09 column was part of an external gas escape investigation that was isolated quickly and did not warrant an evacuation of the area at the time.

The fires were appliance fires not building fires. The majority being at Storage Hot Water Systems.

There have been no explosion reports received or responded to over the last five years.

2.4.3 Significant Environmental Incidents

Significant Environmental Incidents are those in which APT Allgas or its contractors are directly involved in a breach of environmental legislation whilst working on gas assets. Such incidents would be reported to, and investigated by, the local government authority.

Environmental incidents are reported to APA and the EPA as and when they occur. The numbers are recorded monthly in the Operations Risk Management Key Performance Indicators report. There have been no significant environmental incidents reported over the last 5 years.

	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10
Significant Environmental Incidents	0	0	0	0	0	0

2.5 Network Utilisation

Consumer No's	FY 07/08	FY 08/09	FY 09/10
Consuming less than 10 TJ pa			
Residential	69,238	73,327	77,981
Small commercial and industrial	3,497	3,614	3,298
Consuming more than 10 TJ pa			
Large commercial and industrial	115	126	105
Total number of connections	**72,850**	**77,067**	**81,963**
Total Mains/Pipelines Length (Kms)	**2,704**	**2,842**	**2,943**
Connections/Km	**26.94**	**27.12**	**27.85**

Gas Volumes	FY 07/08	FY 08/09	FY 09/10
Total gas received (GJ)	**11,062,693**	**10,903,268**	**10,966.27**
Total gas used (GJ)	**10,530,994**	**10,518,806**	**10,528.58**
Total unaccounted for gas (GJ)	**531,698**	**384,462**	**437.69**

These figures exclude Queensland Nitrates P/L at Moura who through a 1 kilometre Class 900 steel service use an average of 2,820 TJ/Annum.

2.6 Key Network Parameters

2.6.1 Installed Mains

The following table summarises generally the gas assets making up these networks by material types and pressures on a percentage basis.

Installed Mains – APT Allgas Energy Networks (1 July 2010)							
	Nylon (m)	Polyethylene (m)	Protected Steel (m)	Unprotected Steel (m)	Cast Iron (m)	Total (m)	Total %
Transmission			468,357			468,357	15.9%
High	4,253	1,671,337	62,474	2,060	522	1,740,645	59.1%
Medium	204	180,756		84,807	173,177	438,943	14.9%
Low	329	76,354		52,091	166,675	295,450	10.0%
Total	4,786	1,928,446	530,831	138,958	340,374	**2,943,395**	100.0%
Total %	0.2%	65.5%	18.0%	4.7%	11.6%	100.0%	

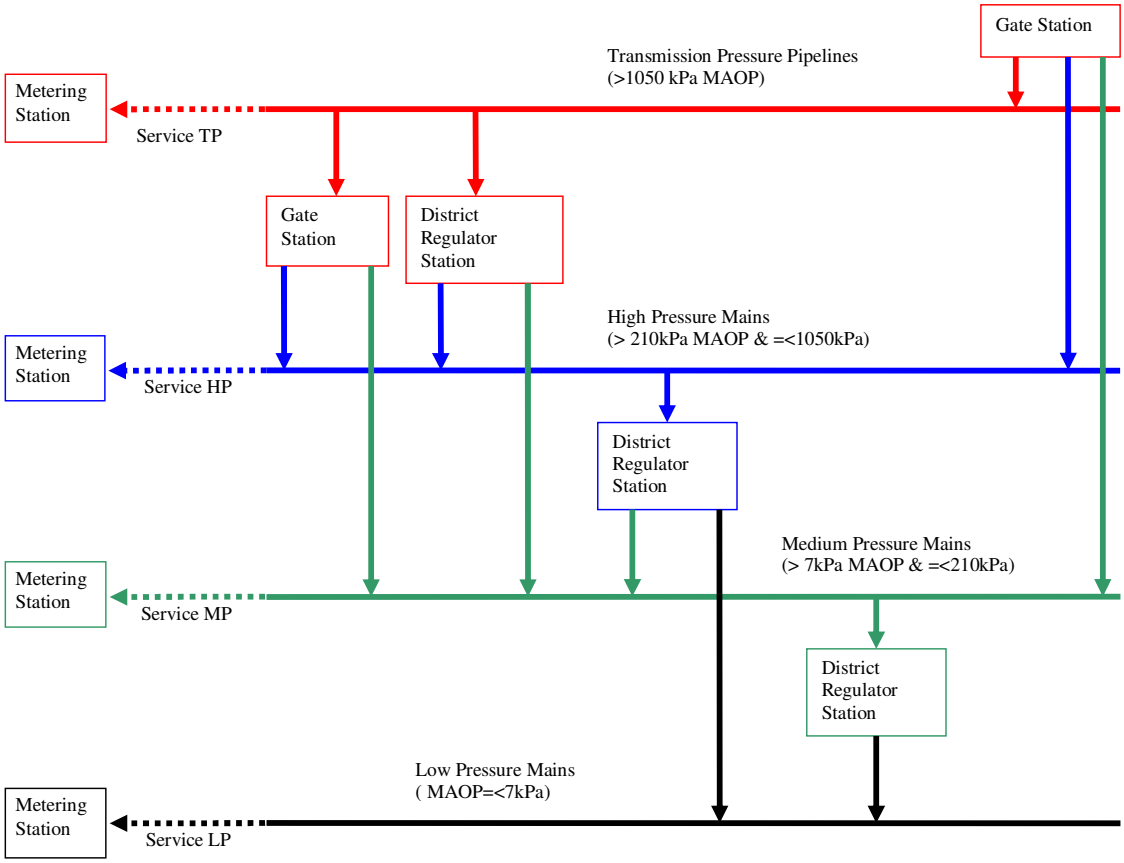
SECTION 3 - NETWORK ASSET OVERVIEW

3.1 Gas Networks Overview

The schematic below provides an overview of gas networks and key network components.

Connections between pipelines at different pressures are achieved through the use of pressure reducing installations (PRI's) such as Gate and District Regulator Stations.

DISTRIBUTION NETWORKS CONFIGURATION

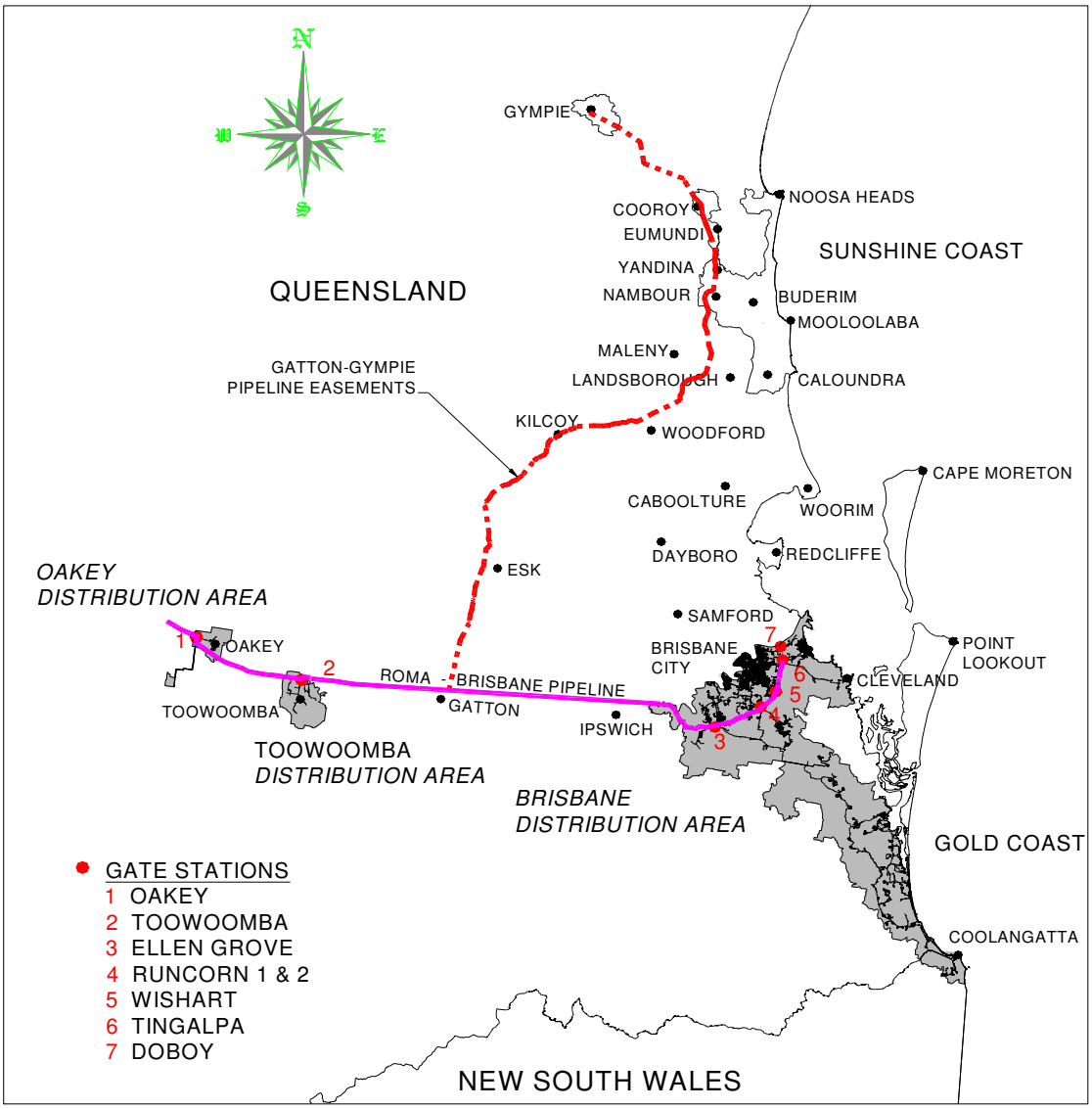


Gas infrastructure components exist at both a physical and a logical level:
Physical: Gate Stations, Pipes, regulators, valves, meters
Logical: Distribution networks (collections of pipes, services and meters).

The management of gas infrastructure components occurs at the physical or logical level depending on the objective of the asset management activity. For example capacity management is at the logical network level while preventative maintenance is carried out on specific at the physical asset level.

3.2 Sources of Supply

Gas is delivered into the APT Allgas Energy Pty Limited Networks via "APA Gate Stations" . These stations consist of facilities that filter the gas, odorise the gas, control the delivery pressures and measure and report on the quantity of gas delivered into each of the APT Allgas networks from the APA Group Roma to Brisbane Pipeline.



The table below summarises the locations of the distribution networks and their associated gate stations.

Network	Custody Transfer (CT)or Gate Station Location	Location	Owner
Oakey	Gate Station	Warrego Highway Oakey	APA
Toowoomba	Gate Station	Hermitage Road Cranley	APA
Brisbane	Ellen Grove 1 Gate Station	Woogaroo Street	APA
	Runcorn Gate Station	Gowan Road Runcorn	APA
	Wishart Gate Station	Greenwood Street Wishart	APA
	Tingalpa Gate Station	Stanton Road Tingalpa	APA
	Doboy Gate Station	Lytton Road Murarrie	APA
Gold Coast	Ellen Grove 2 Gate Station	Woogaroo Street	APA
	Sub-Gate Metering Station	Ashmore Road Molendinar	APA
Qld Nitrates - Moura	CT Gate Station	Three Chain Road Moura	APA
BCC NGV Compressor Station	CT Gate Station	Willawong	APA

3.3 Principal Distribution Networks

APT Allgas Energy Pty Limited owns 4 principal gas supply networks within Queensland and Northern New South Wales and each one may be made up of a collection of sub networks with assets operating under different pressure regimes. These sub networks are defined based on static or dynamic criteria, including operating pressure, gas flow null points, material type or geographic location in the context of specific asset management activities being addressed.

The table below summarises the gas assets making up these networks by District and pressure regime as at July 1 2010. (Numbers are in metres of pipe).

Network	TP	HP	MP	LP	Totals
	>1050 kPa	400-1050kPa	7-200 kPa	< 7 kPa	
Brisbane	254,334	730,557	436,868	294,856	**1,716,614**
South Coast	157,522	470,584	-	214	**628,321**
Northern New South Wales	-	32,562	-	270	**32,832**
Toowoomba	48,294	477,806	2,075	110	**528,286**
Oakey	6,998	29,136	-	-	**36,133**
Moura	1,209	-	-	-	**1,209**
Totals	**468,357**	**1,740,645**	**438,943**	**295,450**	**2,943,395**

The Brisbane metropolitan network, south of the Brisbane River, is by far the largest single network accounting for approximately 58% by length of all Queensland network assets. These networks are highlighted in the following maps:

Figure 1 – South Brisbane Networks

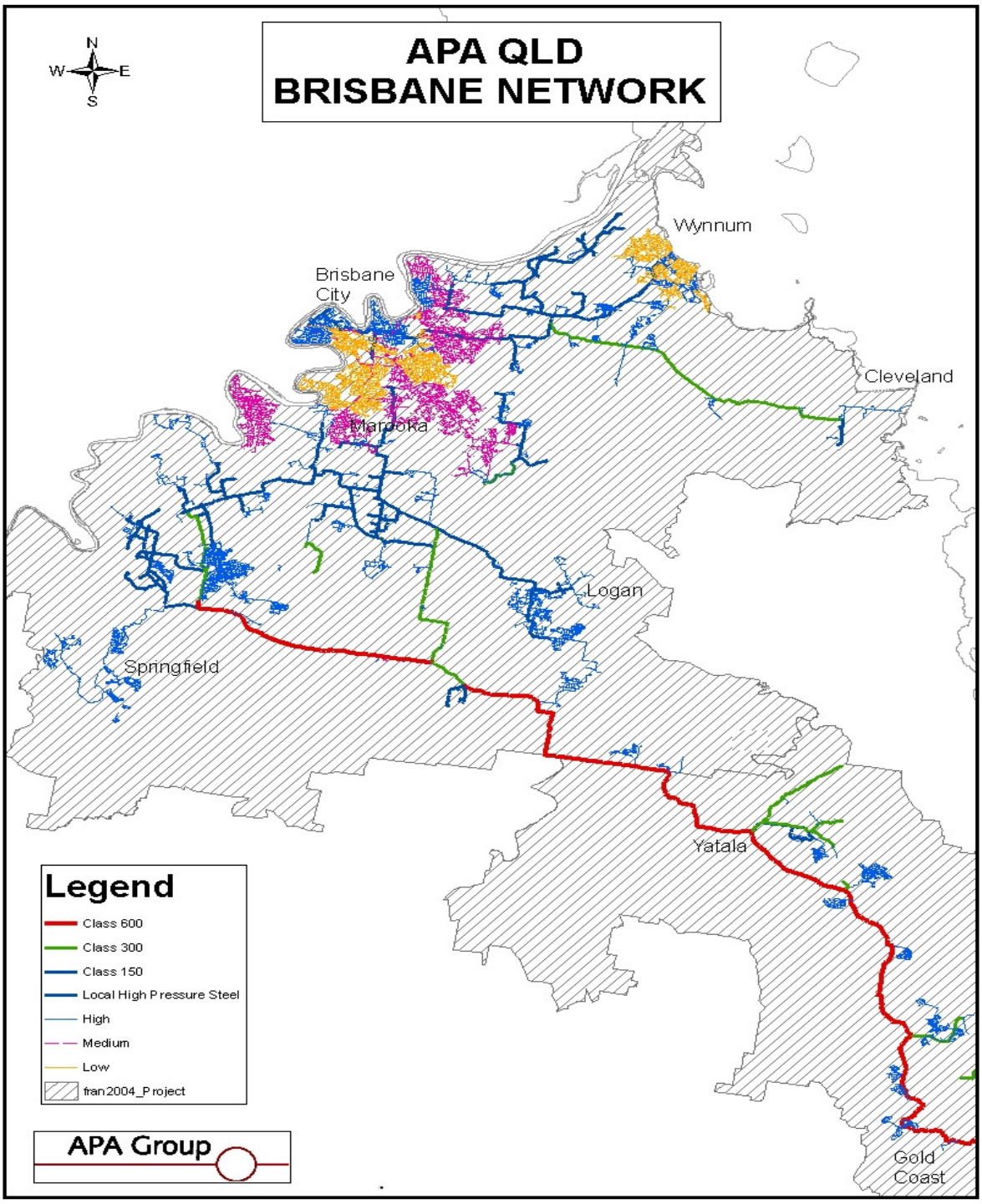


Figure 2 – Gold Coast Networks

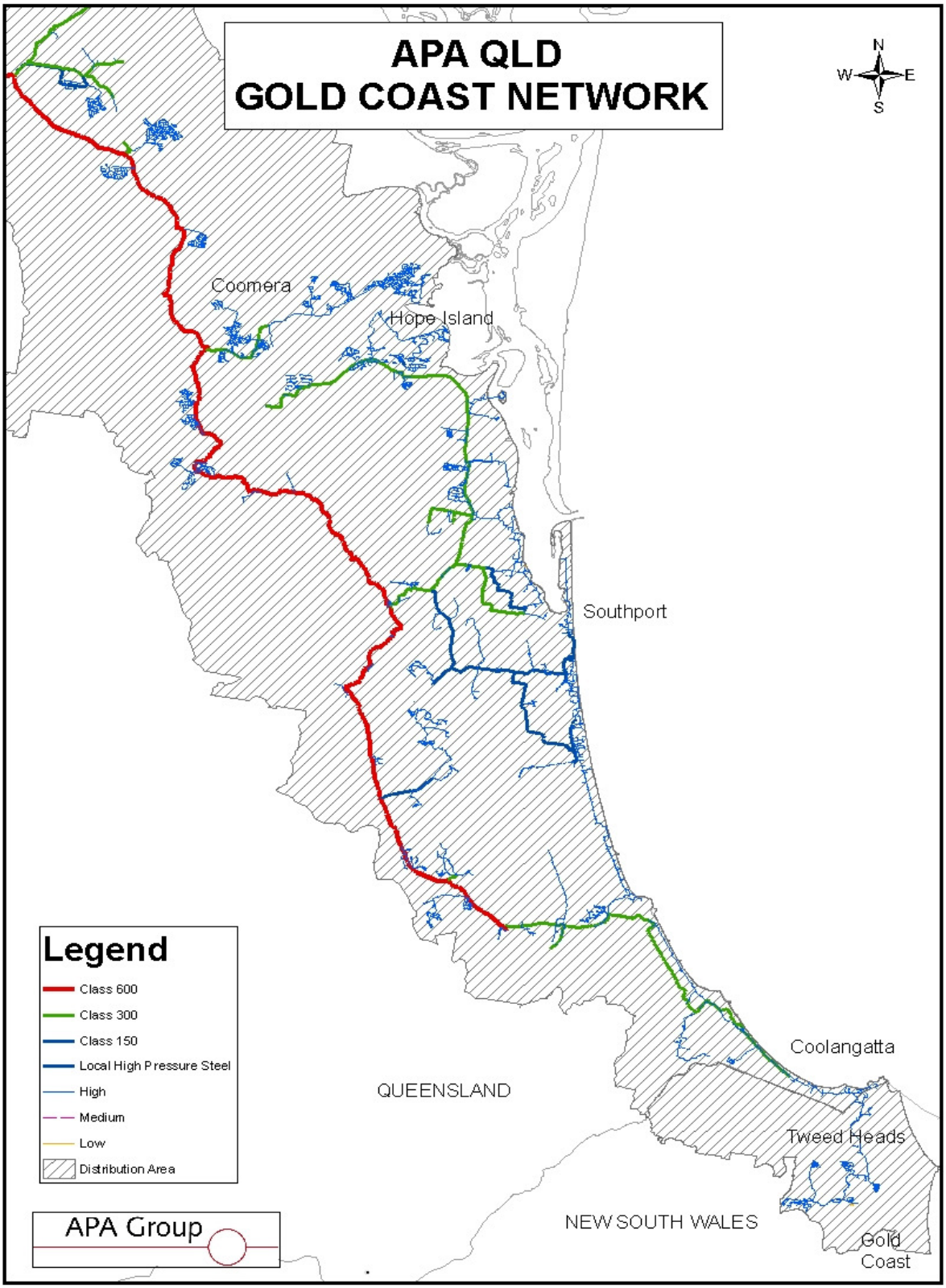
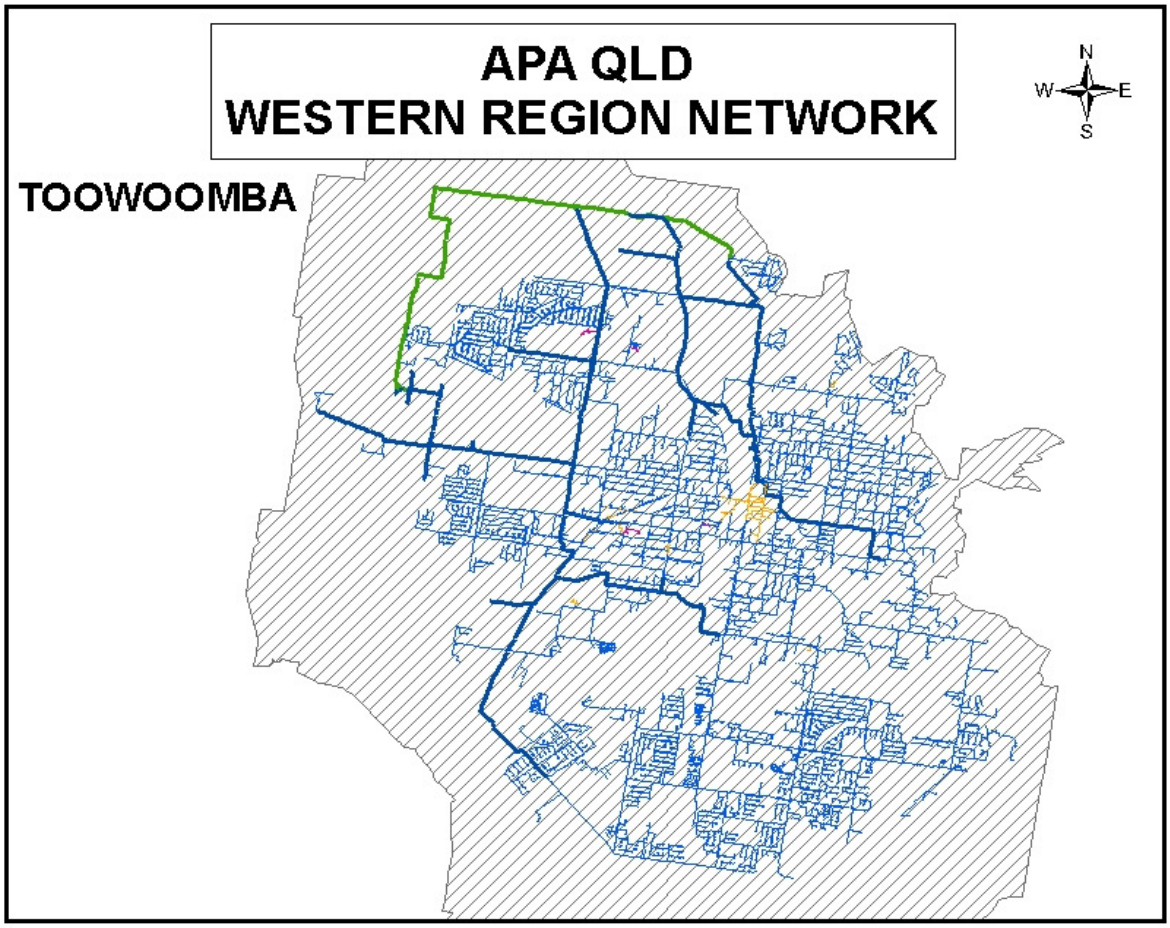
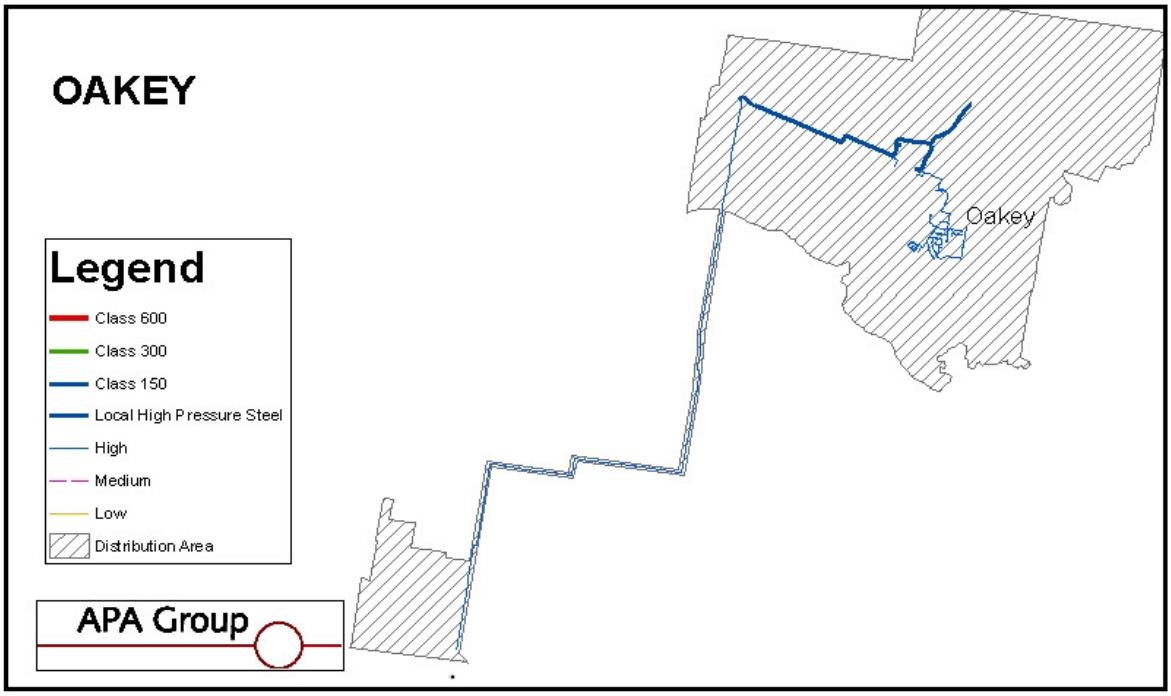


Figure 3 – Western Districts Networks





3.4 Operating Pressure Regimes

The APT Allgas networks operate under five pressure regimes as defined in the following table.

Pressure Regime	Definition
Transmission Pressure (TP)	Networks with a MAOP* between 1050 kPa and 10,000 kPa
Local High Pressure Steel (LHPS)	Networks with a MAOP* between 230kPa and 1050 kPa
High Pressure (HP)	Networks with a MAOP* between 210kPa and 700 kPa
Medium Pressure (MP)	Networks with a MAOP* between 7 kPa and 210 kPa
Low Pressure (LP)	Networks with a MAOP* up to 7 kPa

* Maximum Allowable Operating Pressure

These networks are operated at pressures within nominated maximum and minimum allowable operating pressures. Emergency over pressure control is provided on all networks to ensure the nominated MAOP is not exceeded.

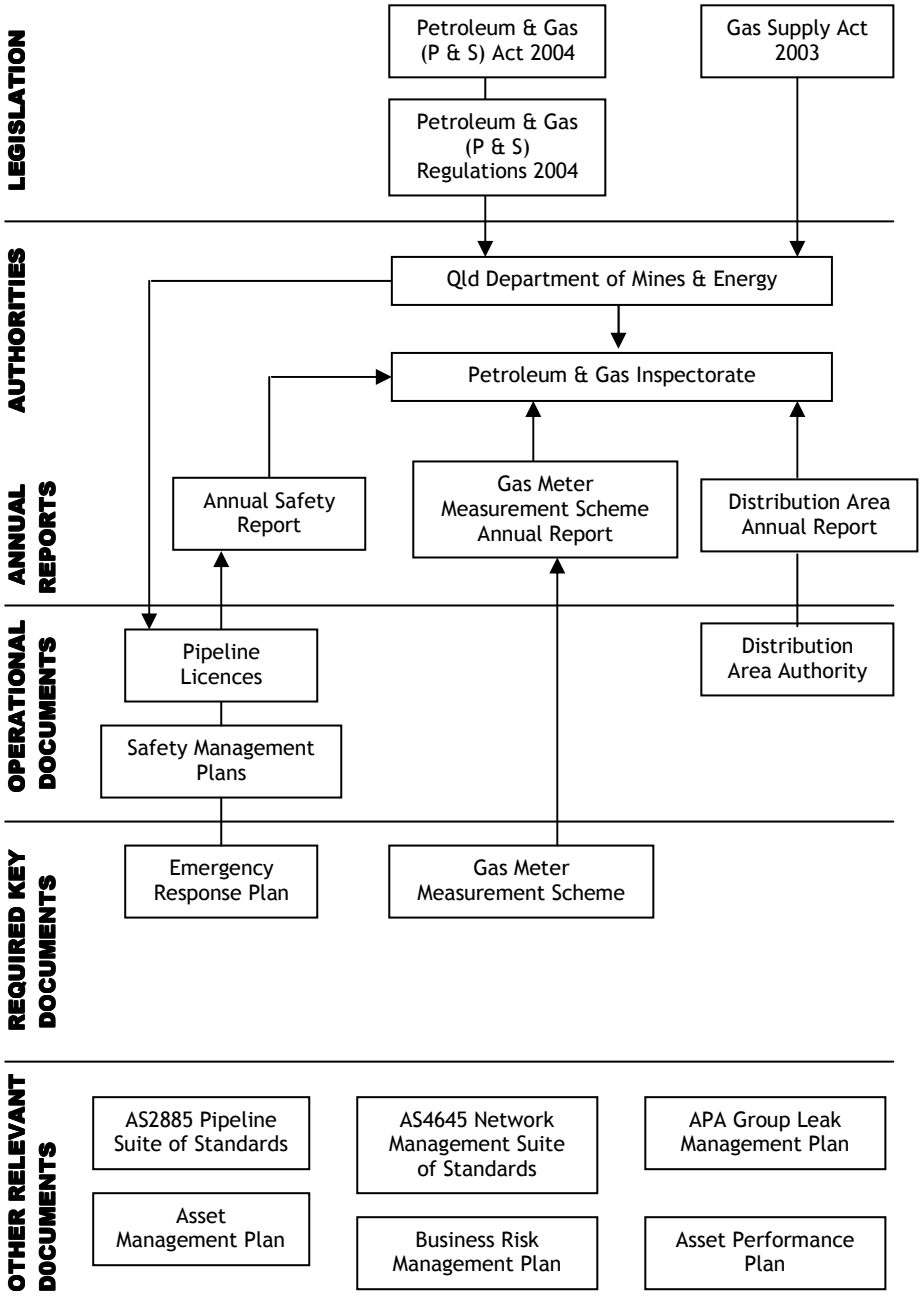
Each network has its own defined operating range depending on the network configuration and capacity requirements. Operating pressures may vary depending on seasonal load demand. Actual operating pressures may vary around these nominal values but in all cases pressures are maintained below the specific MAOP of the network.

SECTION 4 - NETWORK MANAGEMENT PLANS

4.1 Regulatory Compliance Management Plan

4.1.1 Operating Framework

The diagram below shows the framework for the Queensland jurisdiction in terms of key regulating bodies and documents.



In Queensland, the key regulatory instruments with which APT Allgas and APA must comply are:

Petroleum and Gas (Production and Safety) Act 2004 No.4F
Gas Supply Act 2003
National Gas (Queensland) Act 2008
Workplace Health and Safety Act 1995
Environmental Protection Act 1994 – 9E

4.1.2 Applicable Regulations, Codes and Standards

Petroleum and Gas (Production and Safety) Regulation 2004 No. 4F
National Gas (Queensland) Regulation 2008
Gas Supply Regulation 2007
Disaster Management Act 2003
Environmental Protection Regulation 1998
Workplace Health and Safety Regulation 2008
Clean Energy Act 2008
Integrated Planning Regulation 1998
Energy Ombudsman Act 2006
Energy Ombudsman Regulation 2007
Native Title (Queensland) Act 1993
National Gas Law and Rules

- AS 4645.1:2008 Gas Distribution Networks – Network Management
- AS 4645.2:2008 Gas Distribution Networks – Steel Pipe Systems
- AS 4645.3:2008 Gas Distribution Networks – Plastic Pipe Systems
- AS/NZS 2430-2004 Classification of Hazardous Areas
- AS 2885.0–2008 Pipelines Gas and Liquid Petroleum – General Requirements
- AS 2885.1–2007 and Amendment 1:2009 Pipelines Gas and Liquid Petroleum – Design and Construction
- AS 2885.2–2007 Pipelines Gas and Liquid Petroleum – Welding
- AS 2885.3–2001 Pipelines Gas and Liquid Petroleum – Operations and Maintenance
- AS 2885.5–2002 Pipelines Gas and Liquid Petroleum – Field Pressure Testing
- AS 4041-2006 Pressure Piping
- AS/NZS 4130-2009 Polyethylene (PE) Pipes for pressure applications
- AS/NZS 4944-2006 Gas Meters – In Service Compliance Testing
- AS ISO 13443-2007 Natural Gas – Standard Reference Conditions
- AS 4564-2005 Specification for general purpose natural gas

In New South Wales, the additional regulatory instruments with which APT Allgas and APA must comply are:

- Gas Supply Act 1996 No 38
- Gas Supply (Safety and Network Management) Regulation 2008
- Gas Supply (Gas Meters) Regulation 2002
- Gas Supply (Natural Gas Retail Competition) Regulation 2001
- National Gas (NSW) Act 2008 No 31
- Pipelines Act 1967 No 90
- Pipelines Regulation 2005
- Independent Pricing and Regulatory Tribunal Act 1992 No 39
- Fair Trading Regulation 2007
- Home Building Act 1989 No.147
- Home Building Regulation 2004
- Environmental Planning and Assessment Act 1979 No 203
- Environmental Planning and Assessment Regulation 2000
- Protection of the Environment Operations Act 1997 No 156
- Protection of the Environment Operations (Clean Air) Regulation 2002
- Energy and Utilities Administration Act 1987 No 103
- Industrial Relations Act 1996 No 17
- Occupational Health and Safety Act 2000 No 40
- Occupation Health and Safety Regulation 2201

4.1.3 Regulatory Reporting

4.1.3.1 Authorities

Queensland Department of Mines & Energy (DME)
Australian Energy Regulator (AER)
Queensland Department of Industrial Relations (DIR)
Department of Water and Energy (DWE)

4.1.3.2 Licences

Pipeline Licence for the Moura Lateral
Area Distribution Authorities
NSW Reticulator's Authorisation

4.1.3.3 Required Documents

Qld Department of Mines & Energy and the NSW Department of Water & Energy
Safety Management Plan (Also known as: Safety and Operating Plan)
Emergency Response Plan, and for the
Australian Energy Regulator
Queensland Access Arrangements

4.1.3.4 Required Reports

- Area Distribution Authority Annual Report (DME)
- Annual Safety Report under the Petroleum and Gas Act (DME)
- Audit and Inspection Fee Returns (DME)
- Queensland Networks Measurement Management Plan Annual Report (DME)
- Annual Performance Report (DWE)
- Annual Review of Safety & Operating Plan (DWE)

These annual reports include operational information on:

- The quantity of gas entering the distribution system from each source;
- The total estimated amount of unaccounted for gas lost from the distribution system;
- The condition and composition of the distribution system;
- The quantity and type of gas distributed to small consumers and other consumers;
- The number of small and other consumers connected to the distribution system;
- The number of connections and disconnections of consumers to or from the distribution system;
- The number and type of complaints received in respect of detectability of gas odour, poor supply pressure etc;
- Details of any failure to comply with Acts and/or Regulations;
- Performance Indicators;
- Number of new connections not completed by the agreed date;
- Number of previously connected supply addresses reconnected, and
- Number of planned and unplanned interruptions.

4.1.3.5 Risk Management KPI's

The following Key Performance Indicators are reported on an annual basis and aid in determining the effectiveness of risk management:

- Number of over-pressurisations;
- Number of instances of 3rd party damage (mains and services);
- Number of locations provided to third parties (DBYD);
- Number of leaks entering a building from mains and services;
- Number of fires sourced by a gas leak from the network;
- Number of instances of out of specification gas entering the network;
- Number of public reported leaks (mains and services);
- Number of training hours per Queensland Networks employee/contractor;
- Number of unplanned outages (of greater than 10 consumers);
- Number of leaks detected by Leakage Surveys per km of surveyed mains per year;
- Number of regulator failures (including active) per year;
- Number of completed emergency plan exercises;
- Number of evacuations directly attributed to a gas leak from mains or services, and
- Number of incidents involving attendance of the Fire Services related to a gas leak.

4.1.4 Regulatory Audits

The Queensland Department of Mines and Energy Gas Inspectorate did not carry out any audits during the 2008/09 year and to date have not carried out an audit during the 2009/2010 year.

In New South Wales however it is a legislative requirement that an audit of the Safety and Operating Plan for each New South Wales Network is carried out on an annual basis. The audits of Northern New South Wales and the Tamworth Safety and Operating Plans determined whether the APA Group is in compliance with the requirements of the Gas Supply (Safety Management) Regulation 2008 and its own procedures, and had adequate and effective internal controls over its operational processes.

4.1.5 Regulatory Compliance - Risks/Issues/Actions

In general, regulatory codes, standards and regulations are monitored through SAI Global standards watch and state legislative services that indicate changes to Acts and Regulations at State level. Regular internal and external audits also identify how APT Allgas and APA currently respond to legislative and procedural requirements and where necessary identify actions needed to raise our level of compliance.

Recently the biggest change was identified by the audit of the Queensland Networks Safety and Operating Plan for the Tamworth New South Wales network. The audit identified within AS4645.1 the need for an individual “Formal Safety Assessment” (FSA) for each network. Although the Business Risk Management Plan provides a generic FSA the audit indicated that, in the opinion of the auditor, there was a need to create an individual FSA that identified all the critical aspects of the Tamworth network and the mitigating actions taken to reduce risk to ALARP.

Progress to date has identified all the APA Group documentation and operational activities that respond to the needs of each FSA requirement in AS4645.1. In addition the Networks Risk Register identifies the critical aspects of the APT Allgas Energy Pty Limited Queensland networks and the mitigating actions to reduce the risk rating to as low as possible.

4.2 Business Risk Management Plan

4.2.1 Overview

The Business Risk Management Plan (BRMP) is maintained by APA Group Queensland Networks to satisfy a holistic, risk based management approach. A brief description of the assets covered by the plan along with a list of accountable managers responsible for managing specific business risks have been identified and the methodology of Risk Management is documented in detail. The Queensland Networks plan is based upon the outcomes of a generic Network Risk Analysis which is reviewed every 5 years. The Business Risk Management Plan itself is reviewed annually on the basis of a continuous improvement process of plan, act, monitor and review.

The business risk assessment process provides a framework to:

1. Identify the key risks, likelihood and effect.
2. Assess the effectiveness of current control for those risks.
3. Develop action plans for improving the effectiveness of risk controls in each site or activity.
4. Provide a sound basis for developing and improving risk management plans for each site or activity, and the implementation of audit and inspection findings.

Each BRMP lists the existing controls that are used to manage the risks to an acceptable level and any actions to be taken to reduce the key risks to an acceptable level.

4.2.2 BRMP - Key Risks/Issues/Actions

The key risks for Queensland networks have been determined by consolidating and reviewing the key risks identified in the October 2008 Review of operational risk assessments.

A complete list of High, Moderate and Low risks is detailed in the Queensland Gas Networks Risk Assessment final report.

4.3 Safety and Operating Plan

4.3.1 Overview

Safety and Operating Plans, referred to in Queensland Legislation as the Safety Management Plans, describe activities designed to ensure the operation of the gas distribution network and licensed pipelines in a prudent and efficient manner.

There are separate plans for pipelines or networks. Each plan addresses the following areas of the relevant asset's operation:

- Description of the network/pipeline;
- Risk Management methodology;
- Identification of relevant codes, standards, legislation, APA procedures etc;
- Management of the Network's/pipeline's operations;
- Safety;
- Management of emergency response;
- Organisation structure.

The Safety Management Plan (Safety & Operating Plan) is part of an overall management system approach and is expected to follow a continuous improvement cycle of Plan/Act/Monitor/Review.

The objectives of the Plan are to ensure that:

- A strong focus on safety and reliability is maintained in relation to the operation and management of the APT Allgas gas networks and Pipelines in Queensland.
- Suitable safety management systems are in place and operating to ensure that the risks relating to the operation of the APT Allgas gas assets are effectively managed to keep risks As Low As Reasonably Practicable (ALARP).
- All relevant information related to the safe and reliable operation of the APT Allgas gas assets is communicated to those needing such information.

These plans are written to comply with the requirements of with the Australian Standards AS 4645.1:2008 and AS 2885 with specific reference to the content requirements of Clause 675 of the Queensland Petroleum and Gas (Production & Safety) Act 2004 and the NSW Gas Supply (Safety and Network Management) Regulation 2008.

4.3.2 Reviews

The Safety Plan is reviewed at the discretion of the Queensland Department of Mines and Energy Gas Inspectorate. It is not audited and reviewed on specific periodical basis. The Safety Management Plans for the APT Allgas Energy Pty Limited Queensland assets were not the subject of an audit this year.

New South Wales however requires a periodic audit of Safety and Operating Plans (SaOP) on an annual basis. The audit for the Northern New South Wales network SaOP is carried out in June each year.

Internally the Safety and Operating Plan is reviewed by APA Queensland Networks annually to verify that the objectives of the plan are being met and that the risks are

being managed effectively. The outcome of the review process is to provide constructive feedback to facilitate improvement.

The annual review considers the following:

- Review of the key risks and controls
- Progress of key actions
- Performance of the KPI's
- Review of audit, inspection and incident reports
- Review of any risk assessments carried out during the year
- Review of the BRMP

In addition a generic formal risk assessment for operating and maintaining a gas distribution network is completed at a frequency of no more than 5 years and, where appropriate, the results of this are incorporated into revised Safety Plans.

4.3.3 Risks/Issues/Actions

No Audit was carried out by the Queensland Department of Mines and Energy and there are no outstanding issues/actions.

The annual audit of the Northern New South Wales SaOP for the New South Wales Department of Water and Energy in June 2010 however resulted in the identification of minor opportunities for improvement.

Recommendations raised in the 2009 audit have generally been addressed in the revised Safety Management Plan (Safety & Operating Plan) of April 2010.

The audit concluded/recommended:

- APA has made significant strides in its awareness program relating to Emergency Response requirements however there was a need for annual performance goals.
- APA Group develop and implement a comprehensive awareness program, which will require emergency preparedness plans with third parties.
- A procedure to accommodate notification and subsequent Certificate of Compliance for connection/reconnection after an internal gas system fails a pressure test to be developed and referenced in the Safety and Operating Plan.
- Monitor the training levels of contractors should form part of the APA Business Managers site review.
- At the next review of the Emergency Response Plan, include references to the New South Wales legislation.

4.4 Network Load Growth & Demand Forecast Plan

4.4.1 Overview

The purpose of this plan is to detail market issues, trends and influences along with forecast new connections and volumes for the various market sectors, marketing programmes and budgets.

Load growth forecasting is a critical input to network capacity modelling and provides the basis for determining where and how networks are augmented to meet future demand.

At the macro level, forecasts of demand for each of the APT Allgas regions are developed using inputs from independent forecasters where appropriate.

For network design and planning purposes the demand forecasts are augmented with location specific information sourced from Government/Council planning authorities so that intra-network constraints can be identified and future capital expenditure allocations optimised.

The APA Group has formulated its forecasts of natural gas demand for the APT Allgas networks regulated networks using a forward looking methodology that takes into consideration projections of macroeconomic activity, microeconomic behaviour and government policy initiatives.

With the exception of the new residential and commercial developments, the demand forecasts relate to the established distribution network allowing for the usual incremental expansions. The forecasts relating to the new developments are different in that they are discrete projects that will receive targeted business development activities in order to ensure projected customer connection and volumes are achieved.

The Load Growth & Demand Forecast Plan details the:

1. Forecasting methodology for Demand for Large Industrial Users (greater than 10 TJ per annum).
2. Derivation of the demand forecasts for the Commercial segment.
3. Derivation of the demand forecasts of Domestic Users segment.
4. Forecasts of demand for the new anticipated Residential and commercial development areas to be reticulated in the next Access Arrangements Period.
5. The projected gas demand and consumer numbers by segment and tariff zone.
6. Available historical data for the 2005/6 – 2009/10 period.

4.4.2 Risks/Issues/Actions

The seven strategic areas listed below were the prime target for network development and consequently the networks have been able to keep in step with the development that has occurred within these areas during that period:

- Coomera region;
- Gold Coast;
- Tweed district Queensland and NSW;
- Yatala industrial area;
- Brisbane central redevelopment areas, and the
- Port of Brisbane at Doboy.

This trend is fully expected to be on-going with continued growth in both Residential and Commercial developments in the Coomera/Hope Island, Gold Coast and Northern New South Wales areas adjacent to or within the current APT Allgas networks.

4.5 Capacity Management Strategic Plan

4.5.1 Overview

The network Capacity Management Strategic Plan1 integrates knowledge of existing and future customer requirements, operational requirements and risk management options to be able to optimise performance of gas distribution systems.

This document includes an overview of the distribution networks covered by this plan, and the protocols associated with network capacity management, load forecast, performance review and network augmentation requirements.

The objective of the gas distribution networks Capacity Management Strategic Plan is to document:

- The current capacity performance of the gas distribution networks
- The basis for maintaining capacity within the gas distribution networks
- The scope, timing and budget estimates of augmentation projects required to cost effectively sustain network growth and maintain a safe and reliable supply of gas to consumers

4.5.2 Risks/Issues

The network capacity management process integrates knowledge of existing and future customer requirements, operational requirements and risk management options to be able to optimise performance of gas distribution systems.

Current and forecast future network performance is analysed to identify operational risks and performance improvement opportunities related to gas delivery to existing and potential future end users.

Key input to this process is the forecast future growth of customer numbers and related load growth. Forecasted customer numbers are converted to network peak day hourly demand profile using diversity factors specific for this region and actual peak day hourly load profiles.

Various network configuration options are analysed using computer based network models to optimise augmentation solutions. The consequence and likelihood of additional network load and or a single point failure event of either a supply main or supply regulator is considered with specific risk issues feeding into the overall network augmentation design and review process.

4.5.2.1 Transmission Pipelines and High Pressure Steel Networks

Most of existing gate stations, district regulator stations, transmission pipelines and high pressure steel networks have sufficient capacities to meet current customer demands.

Critical capacity related risks are as follows:

[1] Capacity Management Strategic Plan

- Existing DN100 class 300 pipeline supplying Cleveland currently operates at only 1,000kPa and has very limited spare capacity. Based on potential new domestic developments in vicinity of this pipeline and additional commercial loads it is estimated that pipeline will not be capable to meet all customer demands in next 3 to 5 years and will require increase of operating pressure including new connection to Tingalpa Gate Station.

- Existing DN150/200 class 600/300 transmission pipeline connecting Ellen Grove 2 Gate Station and South Coast Region has limited spare capacity and is estimated based on current customer connection forecast that at winter 2016 will not be able to meet all customer demands if Stage 2 of pipeline reinforcement project is not implemented.

- Existing high pressure steel networks supplying Surfers Paradise and Broadbeach working with very limited spare capacity and is estimated, based on customer connection forecast that will be not able to meet customer demands for winter 2013 without reinforcement.

4.5.2.2 High and Medium Pressure Polyethylene Networks

Most of existing district regulator stations and high pressure polyethylene networks have sufficient capacities to meet current customer demands.

Critical capacity related risks are:

- Existing high pressure polyethylene networks in Surfers Paradise and Broadbeach have difficulty to meet current and especially proposed new commercial customer demands.

4.5.2.3 Old Low and Medium Pressure Networks

Urban redevelopment throughout the suburbs of Brisbane is creating capacity problems in the old low and medium pressure networks. Additional peak hour demand from either higher density housing or use of high instantaneous demand appliances has seen an increase in the number of identified supply problems. Large number of complaints has been received from consumers regarding poor supply pressures. These have generally been traced to either water ingress, the use of high demand appliances or “organic growth” in areas where housing density has been increased because of urban consolidation developments.

Critical capacity related risks are as follows:

- Based on network modelling it is estimated that approximately 15% or 65 km of medium pressure and 150km or 50% of low pressure mains in Brisbane networks have insufficient mains capacity to service modern high demand appliances.

4.5.3 Proposed Network Augmentation Projects

4.5.3.1 Augmentation of existing high-pressure steel network supplying gas to Surfers Paradise and Broadbeach

The proposed option includes establishment of new district regulator station and extension of new DN100 class 150 pipeline approximately 3.65km long in Ferry Road to Slatyer Avenue Southport.

It is estimated that proposed option will increase capacity of existing high-pressure network by approximately 4,000Sm3/h what will be sufficient to meet future customer demands. Additional benefit is and establishment of high-pressure ring main that will improve reliability of supply to Southport, Surfers Paradise, Broadbeach, Ashmore, Benowa and Bundall.

4.5.3.2 South Coast Supply Reinforcement Stage 2

A single 85 km long DN150 steel pipeline was constructed in 1989 to act as a feeder main to introduce natural gas from Roma Brisbane Pipeline to the South Coast Region. 10 years ago Allgas has identified that the existing feeder pipeline will not have a capacity to support ongoing growth of gas business in the South Coast Region. Based on outcome of feasibility reports it was recommended to construct a 36km long 200DN class 600 steel pipeline from the existing Ellen Grove Gate Station to the Yatala Industrial Estate. Allgas decided to implement this recommendation in 3 Stages, and effectively the Stage 1, 12.4km of 200mm high pressure main, was completed in 2006.

The proposed Stage 2 comprises the construction of 10.2 km of DN200 pipeline from the end of Stage 1 to Logan Reserve and connection to existing South Coast feeder pipeline. The construction of Stage 2 should be completed before winter 2016 to ensure gas supply reliability for the South Coast Region.

Additional benefit is that the proposed Stage 2 pipeline will enhance a security of supply for the risk of existing feeder main failure due to both, third party damage and structural failure.

4.5.3.3 Pressure Upgrade for Cleveland Pipeline

Tingalpa Gate Station high-pressure steel network has 15km long DN100 steel pipeline supplying Cleveland with MAOP=5,000kPa that is not directly connected to gate station and currently operates at 1,000kPa. There are potential domestic, commercial and industrial developments that may require significant additional demand in next few years. This additional demand will require increase of supply pressures to approximately 2,000kPa.

Upgrade of Tingalpa Gate Station, currently under construction, will provide additional class 300 outlet that will be able to supply gas at sufficient pressure levels.

This project recommends construction of new approximately 200m long DN100 class 300 pipeline to link Cleveland Pipeline to the proposed new outlet from Tingalpa Gate Station.

4.5.3.4 Surfers Paradise and Broadbeach High Pressure Polyethylene Network Augmentation

Existing high pressure polyethylene networks in Surfers Paradise and Broadbeach have difficulty to meet current and especially proposed new customer demands. Approximately 63/90mm PE link mains are required to improve capacity of network and meet customer demands.

4.5.3.5 Minor Network Augmentation Projects

Network modelling has focussed on maintaining capacity in the principal supply mains. It is expected that there will be a number of local sub network capacity issues to be addressed on an annual basis pending the replacement and upgrade of the old low and medium pressure networks.

The majority of the issues are associated with new developments, the use of high instantaneous demand appliances within low pressure networks and reduced capacity as result of water ingress.

Capacity shortfalls are typically identified through the annual pressure survey programme and customer supply complaints. Invariably an additional interconnection, supply regulator or a pressure upgrade is required to boost local system pressures to levels consistent with maintaining a safe and reliable supply of gas to consumer premises.

4.6 Mains Replacement Strategic Plan

4.6.1 Overview

The gas distribution network Mains Replacement Strategic Plan provides the basis and justification for a mains replacement programme. This replacement plan focuses on optimising the use of available replacement capital expenditure funds by targeting replacement of mains that:

- Present a high risk to the public and or maintenance personnel
- Have insufficient capacity to meet current and future consumer demands
- Incur high maintenance and operating costs

This document outlines the objective of maintaining integrity of the network and the capacity to meet current customer demands, reducing maintenance and operational risks and costs within the old low and medium pressure distribution networks. As part of this mains replacement plan the forecast safety and economic benefits are closely monitored to substantiate and justify the proposed mains replacement costs.

The output of the plan is the forecast mains replacement capital expenditure with focus primarily on retiring the old cast iron and unprotected steel mains from the network. Allgas operates some 400km of cast iron and unprotected steel mains (CI and UPS) within Brisbane which are approaching the end of their useful lives with public risk, supply reliability and increasing operating costs key drivers for replacement.

Various options were examined to establish the scope and timing of replacement. A strategy based on the minimum level of replacement that will maintain the integrity of the network at an acceptable level of risk commensurate with prudent use of available funds has been recommended.

This replacement strategy is considered to conform to capital expenditure rules specified in National Gas Rules, Section 79(2) on the basis that it is necessary to:

- Improve the safety to public
- Maintain integrity of natural gas supply to existing customers

4.6.2 Risks/Issues/Actions

Key risks associated with existing CI & UPS mains are:

Public safety – Potential for gas in buildings from leaking gas mains
Network Integrity/Reliability – Water in LP main issues
Supply - Capacity to meet future demand on the LP and MP networks
Revenue – Reduced revenue from constrained capacity of LP and MP networks.
Operating expenditure – Increasing costs associated with deterioration of the network

Environmental – Increasing UAFG contributing to greenhouse gas emissions.

Reputation - APT Allgas Energy Pty Ltd reputation as a prudent network owner/operator

The replacement of mains will be prioritised based on a combination of risk, performance and economics. The following sections summarise the individual drivers for replacement.

4.6.2.1 Risk Based Replacement

The prime safety concern associated with CI & UPS is gas entering buildings, especially from a circumferential break in the CI network where a sudden large release of gas has sufficient volume to create an explosive mixture in a nearby building. In locations where there is little open ground for the gas to escape to atmosphere, such as the inner Brisbane city suburbs, then the risk is increased.

Based on a qualitative assessment, approximately 50% (200km) of the remaining cast iron and unprotected steel mains in Brisbane located in the inner city high density occupancy locations. At this stage a quantitative risk analysis, similar to that used by the Victorian and SA DB's has not been undertaken to asses the extent of high risk areas.

As a principle, mains with a relatively high incidence of mains breakage, in high density areas with little or no open ground for mains gas leaks vent will be given priority for replacement.

4.6.2.2 Performance Based Mains Replacement

Approximately 150 km of LP CI & UPS steel mains is unlikely to meet the requirements of modern day appliances. The replacement and upgrade in supply pressures is required to maintain adequate capacity to existing consumers and enable additional growth within these networks.

The dispersed nature of these mains is such that a pressure upgrade of the broader network will be required. The majority of these mains are located within high density areas where urban renewal/consolidation is exacerbating capacity issues.

The replacement and pressure upgrade of these mains provides an effective and efficient long term solution to capacity limitations within these networks.

4.6.2.3 Economic Based Replacement

The 175 km of UPS mains within the Queensland network are over 40 years old and nearing the end of their useful life.

Unlike CI mains where the majority of leak repairs are associated with joints that could be repaired, the first response to a leak on a UPS main is likely to find it riddled with corrosion with piecemeal replacement the only option.

Unless there is a broad insertion and pressure upgrade programme there will be an increasing incidence of piecemeal replacement carrying a significant premium. By comparison to average unit rates for "block" replacement, piecemeal replacement unit rates can be of the order of 3-5 times the cost.

4.6.2.4 The Proposed Mains Replacement Program

The proposed Mains Replacement Program continues the current rate of replacement of about 18 km/year and is considered the lowest rate commensurate with reducing UAFG over time. With this rate of replacement there are some risks with respect to ongoing leaks and maintaining capacity within the LP and MP networks. The following additional risk mitigation measures are recommended:

- To mitigate risks of CI mains leaks in higher density areas it would be prudent to increase planned leak surveys to a 12 month frequency in areas where there is little or no open ground from which leaks can vent.

- To mitigate supply risks on the LP and MP networks careful scrutiny of new connections is required. Areas where capacity is constrained, and cannot be provided on a cost effective basis, then prospective new connections may need to be foregone.

- Development of improved risk, performance and condition assessment tools to better quantify drivers for any acceleration of future replacement.

This replacement strategy is considered to conform to capital expenditure rules specified in National Gas Rules, Section 79(2) on the basis that the expenditure is justified on the grounds that is necessary to:

- Improve the safety to public
- Maintain integrity of natural gas supply to existing customers

4.7 Gas Measurement Management Plan

4.7.1 Overview

The Queensland Networks Meter Measurement Scheme for APT Allgas - Release 6 for the APT Allgas networks is required by the Queensland Petroleum and Gas (Production & Safety) Act and Regulations 2004. The plan contains an overview of the current systems and procedures as well as future practices to be developed to ensure that the measurement of gas complies with all current relevant legislative requirements. The Queensland Networks Meter Measurement Scheme for APT Allgas - Release 6 for the APT Allgas Networks addresses the areas of:

1. Metering
2. Metering purchasing policy & accuracy verification
3. Meter changeover and replacement practice
4. Meter repair and re-verification policy and practice
5. Meter Maintenance practice
6. Gas measurement principles and practice
7. Calorimetry
8. Billing
9. Unaccounted for Gas
10. Training
11. Internal Auditing

The plan also has summary statistical information on:

1. Number of consumers in the Queensland Networks
2. Number and makes of meters in the Queensland Networks
3. Meter test results in the previous year
4. Number of meter changes during the year
5. Number of new meters installed in the previous year
6. Number of consumer requests for meter tests

The plan reviews and summarises the activities carried out by APA over the past 12 months and also any proposed changes to practices and procedures going forward.

4.7.2 Reviews

The Gas Measurement Management Plan is reviewed annually and modified to address changes in company structure that may have occurred over the previous 12 months and also any proposed changes and or modifications to future metering practices and process. The plan is then submitted to the Queensland Department of Mines and Energy Gas Inspectorate for comment and approval.

4.7.3 Risks/Issues/Actions

Key issues and risks associated with the meter life cycle have been summarised in Section 5.6.6 of this AMP.

4.8 Odorant Control & Maintenance Management Plan (Odorising Manual)

4.8.1 Overview

The Queensland Networks "Odorising Manual" details the:

- Requirement for odorising
- Number and location of odorising facilities in Queensland
- Current odorising practice
- Operation and control of existing facilities
- Monitoring of odorant levels
- Training and Competence
- Emergency preparedness and emergency response procedure
- Non Conformance and corrective actions

Natural Gas supplied to Queensland Networks by Pipelines is not odorised. Odorisation of gas supplied to Brisbane, Toowoomba, Oakey and the South Coast APT Allgas networks is carried out by APA Queensland Networks. Monitoring of network odorosity levels is carried out by APA Queensland Networks.

There are eleven (11) odorising sites. Nine are located at Gate Stations and two are located at network consumer sites where gas is un-odorised.

The Queensland Petroleum and Gas (Production and Safety) Act 2004 states that "the prescribed odour for fuel gas is an odour that is distinct, unpleasant and non-persistent; and is of an intensity indicating the presence of gas down to one-fifth of the lower flammability limit".

The following is a list of the legislation that impacts odorising operations:

Queensland

- The Petroleum and Gas (Production & Safety) Act 2004
- The Petroleum and Gas (Production & Safety) Regulations 2004
- Workplace Health & Safety Act 1995
- Environmental Protection Act 1994

New South Wales

- The Gas Supply (Safety and Network Management) Regulation 2008

Common to both States

- Transport Operations, Road Use Management and Dangerous Goods Act 1998
- Dangerous Substance Act 1979

4.8.2 Risks/Issues/Actions

Key issues and risks associated with odorant activities have been summarised in Section 5.3.6 of this AMP.

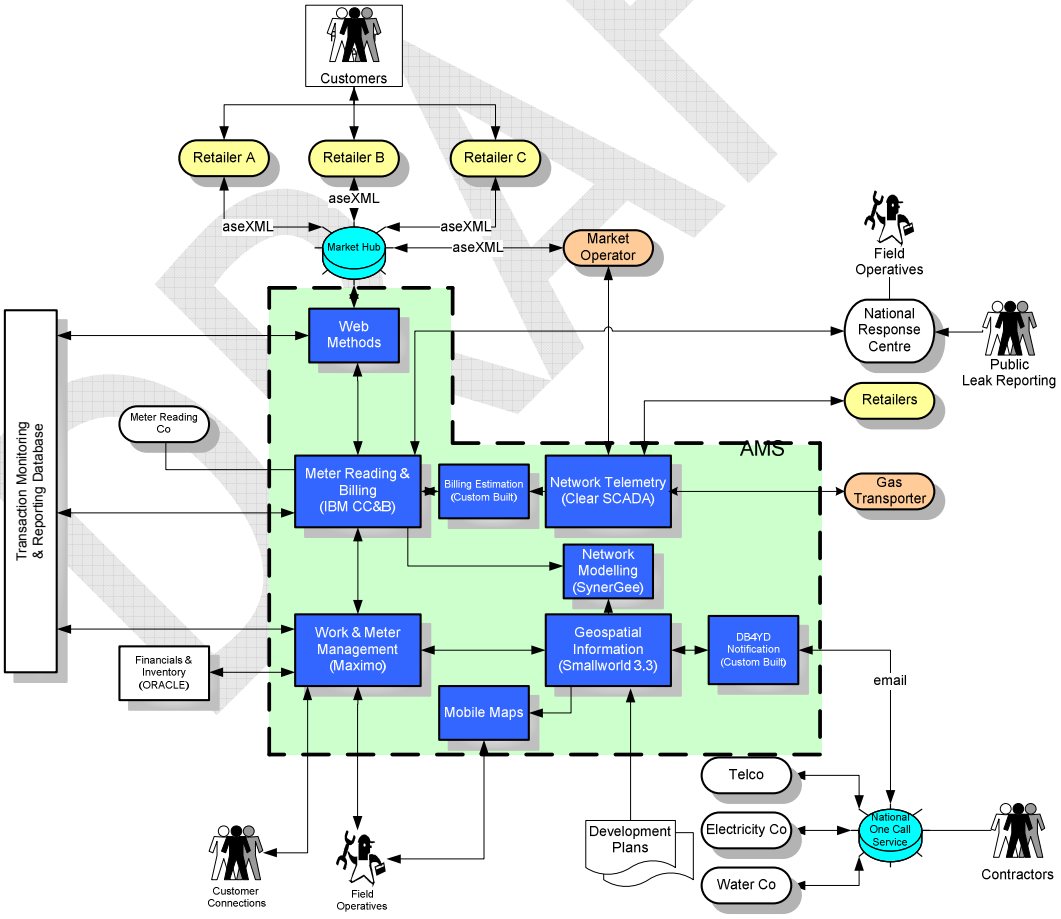
4.9 Asset Information Systems Management Plan

4.9.1 Overview

APA uses a number of computer based systems and applications for:

1. Managing market transactions
2. Issue and control of field work
3. Monitoring and recording gas deliveries to customer sites;
4. Emergency response
5. Monitoring network condition
6. Analysing network capacity
7. Recording the configuration and location of assets.

The following diagram provides a high level context picture of the AMS.



The Asset Management System consists of the following core applications:

1. Web Methods
   - Send & Receive Service Order Requests
   - Send & Receive Meter Fix
   - Send & Receive Customer Transfer requests
2. Meter Reading & Billing System – ORACLE CC&B
   - Transaction Workflow
   - Meter Reading
   - Delivery Point Billing
3. Work Management System – IBM Maximo
   - Planning
   - Dispatching Work
   - Job Completion Details
   - Preventative Maintenance
   - Contractor Payment
   - Meter Management
4. Geospatial Information System- ESRI ArcFM
   - Map Base (Cadastre) Management
   - Network Configuration/Connectivity Management
   - Mains Extension & Replacement Planning
5. Network Modelling System – GASWorks 9.0
   - Capacity Strategic Planning
   - Customer Connection Assessment
   - Emergency Response
6. One Call System – Custom Built
   - Management of National Dial Before You Dig Enquiries
   - Asset Location Notification
7. Network Telemetry System
   - Pressure Monitoring
   - Interval Meter Monitoring & Reporting
   - Custody Transfer Monitoring & Reporting
8. Billing Estimation Module (Red Box)
   - Delivery Point Forward Estimate
   - Interval Consumer Management
   - Base Load & TSF Calculation

APA O&MS is following an IT Strategic Plan, developed for the networks business with the assistance of IBM. The Strategic Plan, initially developed in 2005, proposed a set of projects over a 5 year timeframe (ending mid-2011) that would fill capability gaps and address IT issues categorised as Strategic Imperatives and Architectural Weaknesses.

Subsequently this plan was refined into an Architectural Blueprint and Road Map. The Architectural Blue Print was designed to take advantage of hardware end of life and software upgrade opportunities to deliver cost savings over the original Strategic Plan.

The Roadmap (RMI) aimed to:

- Deliver new capabilities required by the business

- Meets the hardware and software renewal requirements
- Meets the new architectural objectives
- Lowers operating costs over time.

The initiatives and proposals in the Roadmap (RMI) were agreed to by the gas asset owners and work commenced in mid to late 2006 to pursue the RMI outcomes.

In February 2009 an independent external review of the RMI was conducted by representatives from Logica. The review established that APA's business challenges to reduce costs, some of which are regulatory driven, are being addressed with the following business strategies:

- National systems and processes (National strategy, local delivery);
- Maintain core capability in-house;
- Save costs through improved work practices, and
- Delivery of prudent and efficient services to across Envestra and APT Allgas networks.

That review confirmed that the RMI objectives remain aligned with both APA business objectives and international best practices and thus the RMI is still sound in the following ways:

- Recognition of agreed business strategic focus and priorities;
- Use of a holistic approach to guiding architectural principles (infrastructure, application, processes/people, data/information);
- Consider alignment with the business strategy and the need for a national approach to common processes;
- Addressing the historical silos of information through the use of collaborative technologies such as an enterprise services bus, and
- Reduction in IT costs through rationalisation of applications and systems.

Key RMI Projects included:

Reporting & Data Management	Improves data quality & integrity and report development by: Reducing change costs of future initiatives by isolating reporting from the technical implementation of individual systems Providing reporting infrastructure to ensure consistent, timely and accurate production of reports Establishing good practice data management to ensure consistent data definition and quality
Queensland FRC Systems	In addition to regulatory requirements, provides base infrastructure to introduce architectural flexibility, which in turn will: Enable greater flexibility of solution choice for future initiatives Provide an opportunity to prove the advantages and gain experience with the recommended approach Provide re-usable process definitions and interface designs necessary for the Advanced Asset Management initiative Support the use of existing Queensland systems (where appropriate) for FRC entry whilst minimising change-out costs of future initiatives
Advanced Asset Management	Combines the major Maximo and GIS upgrades with a review of asset management processes and the implementation of advanced asset management techniques to enable: Extended asset life and reduced maintenance frequency Better informed asset investment decisions Reduced IT costs through simplification and consolidation of systems Better aligned business processes and system function Broadening the reach of architectural flexibility of the Qld FRC solution to SA & Vic systems to enable the Billing Optimisation initiative.
Billing Optimisation	Leverages the architectural changes wrought by previous initiatives to enable a review and consolidation of billing functions. This in turn drives: Reduced IT costs through simplified and consolidated systems Flexibility in billing solution choice Better alignment of technology choice to billing requirements.

The table below shows how Business Strategic Imperatives and Architectural Weaknesses identified in the original Strategic Plan and RMI were to be addressed by proposed projects under the RMI umbrella. This is the consolidated position on the completion of all proposed projects. It is not reasonable to partially implement and still achieve the RMI objectives.

	Strategic Imperatives							Architectural Weaknesses						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7	WO1	WO2	WO3	WO4	WO5	WO6	WO7
	Advanced Asset Management	Timely & Accurate Business Reporting	Data Integrity & Quality	Reduce Complexity	Process Management	Optimise IT Costs	Responsiveness to Change	Fragmented and duplicated functionality	High level of customisation	Tightly Coupled Interfaces	No reporting repository	Reporting from transactional systems	Broad functional footprint of Cordaptix	Islands of data & functionality
Reporting		√	√			√	√				√	√		
Queensland FRC			√		√	√	√			√				
Advanced Asset Management	√	√	√	√	√	√	√	√	√	√			√	√
Billing Optimisation				√	√	√	√			√			√	
Overall	√	√	√	√	√	√	√	√	√	√	√	√	√	√

The Queensland FRC solution was implemented in 1 July 2007. This included:

- Reporting and Data Management;
- Advanced Asset Management (Maximo - Works Management System);
- Middleware interfaces (BPW) to internal and external systems according to agreed architectural principals, and

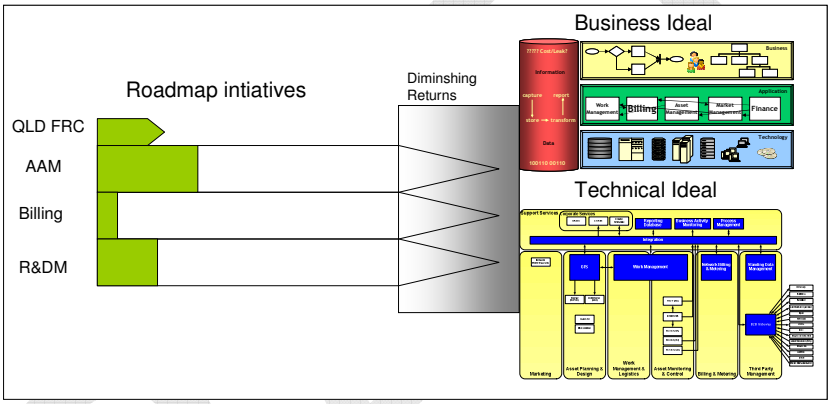
- National alignment of business processes to minimise the need for customisation.

Due to the ambitious timeframe for the scope of work:

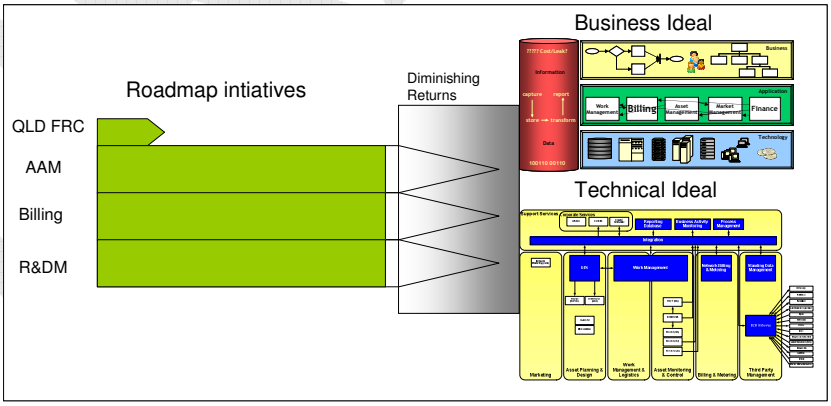
- Not all of the targeted functionally was able to be delivered;
- Certain aspects of the final system were not consistent with targeted architectural principles, and
- Only some of the processes were able to be reviewed and aligned nationally.

The balance of the work to address the above shortfalls has been incorporated into the National Advanced Asset Management Solution (NAAMS) portfolio that has been tasked with finalising delivery of a national solution.

Current position on the roadmap



Future position on the roadmap



At the end of these projects core systems will be in their final configuration but there may still be minor systems or process issues for which the effort and cost to enforce conformity to the principles of the RMI may not be justified.

4.9.2 Risks/Issues/Actions

4.9.2.1 Nationally Consistent & Optimisation of Processes

APA Networks currently operate four separate and disparate Works Management Systems – Maximo 4 in South Australia, Maximo 4 in Victoria, and Maximo 6 in Queensland.

Business processes and business models have been different in each of the jurisdictions and the systems reflect those disparities. In order to enable and extend the benefits already being realised from the 'LEAP' and Business Process Alignment Transformation initiatives, it is necessary to consolidate the disparate systems into one single National system.

Currently business improvement changes, which invariably mean changes to the systems, require complex, time consuming and costly analysis and development on systems that are obsolete and at the end of the technology's lifecycle (Maximo 4 & Smallworld 3.3 in Victoria and South Australia, Infomaster GIS in Qld). The resources and costs to support the systems are also duplicated for each of the systems.

Consolidating all these systems into one single National system will enable APA to quickly respond to Strategic (executive level) business change. The rationalisation into a National system is also mandatory to support the functional model of National systems and processes locally delivered.

Specifically, the following initiatives/projects have been identified to improve functionality to deliver nationally consistent processes, optimising the end to end processes, driving process efficiencies and data quality and integrity.

- WMS Meter Management Process optimisation;
- Network Billing Optimisation/rationalisation;
- WMS National Preventative Maintenance optimisation;
- WMS Invoice Processing, Project and Activity based costing rationalisation & Finance system integration;
- Qld GIS upgrade to a common platform;
- Mobile Dispatch & Field Data Capture;
- CP Database replacement (SA & Qld) ;
- Mobile Mapping for Queensland;
- Data Quality & Integrity Management & National Reporting;
- National SCADA, and
- Web Based Customer Connection System (Developers & Customers).

4.9.3 Projects

The following projects have been identified to complete the RMI portfolio. Details of project timing have been included in Section 4.9.4 of this document.

4.9.3.1 *Works management System Upgrade*

The objective of this project is to upgrade the Maximo works management data into the national works management system (WMS). In conjunction, integration changes will need to be implemented to retain the architectural model.

WMS is one of three core systems that will result in technology that supports national processes and operational efficiency. The other two components are Billing Optimisation (national metering and billing) as well as national Advanced Asset Management (Geographical Information System - GIS). The WMS has the highest level of integration of the three systems and needs to occur before the other two components.

To meet 'Asset Owner' objectives of cost effectiveness and operational efficiency, the Maximo solution must be upgraded otherwise the system change cannot be easily implemented. Without this project any process changes requiring software development will either be cost prohibitive or technically unsound.

4.9.3.2 *Field Data Capture*

The objective of this project is to replace paper based processes with electronic work allocation and "in the field" completion of work orders. As part of the RMI in 2006 a pilot project was completed to identify the technical feasibility of Field Data Capture. The outcomes from the pilot have assisted in determining the approach and associated costs.

This project is required to meet the requirements of Retail Market Procedures 65, which requires information related to commissioning a Meter Installation Registration Number (MIRN) for the first time to be provided to the appropriate retailer by 5 pm the next business day. In order to comply, this project aims to support the capture of fully validated data in the field via the use of field force automation technology as well as to support the flow of information from the field back to the retailers in a timely manner. The Field Data Capture project runs concurrently with the new Works Management System and both need to be fully completed to leverage off architectural changes and technology platforms.

4.9.3.3 *Billing Optimisation*

The purpose of this project is to define the requirements of a network billing solution based on the RMI objective to nationalise a billing package, plus simplify the business billing requirements and provide a cost effective billing solution.

To meet market requirements, industry participants require an FRC technology solution that can manage large volumes of transactions through the end-to end-process, in a timely and accurate fashion. APT Allgas provides this with a suite of integrated 'best of breed' applications that manage the core functions of the FRC environment.

Historically, Allgas Energy used a customised system called the Allgas Customer Information System (ACIS) as the networks billing solution. This was replaced in 2007 with Hansen Utility Billing (HUB) which was used until July 2010 when networks billing was transferred over to Customer Care & Billing (CC&B) in line with the systems used by APA in South Australia and Victoria. This product was originally selected in 2002 as the closest fit for the business as no 'off the shelf' application was available to provide billing functions that catered for the Retail Market Procedures. Technology and billing functionality has changed significantly in that time and this project will align business processes and system functionality to drive business efficiencies.

The Billing Optimisation project is timed to address the CC&B vendor support and hardware renewal requirements. It is expected that either a major upgrade or a change-out approach will be required at this time.

The CC&B billing and workflow solution currently accounts for over half of the business system IT costs. Removing reporting and workflow from the CC&B application presents options to implement a more cost effective standing data and billing solution.

The Billing Optimisation project requires the new Works Management System to be completed to leverage off architectural changes and technology platforms.

4.9.3.4 Advanced Asset Management

The purpose of this project is to upgrade the national network GIS solution used for managing network assets in Queensland. In conjunction with this project, integration changes will need to be implemented to retain the architectural model.

The current GIS application, ESRI ArcFM, was the software selected by ENERGEX in February 2005 as the most suitable for capturing Allgas Energy Pty Limited gas assets with potential for integration with the Maximo Works Management System (WMS) thus providing a similar function to that used in APA Victoria for operational and strategic asset management decisions.

The Advanced Asset Management project is timed to address the GIS vendor support and hardware renewal requirements. The overall decision must also take into consideration that the GIS application used in Queensland to record Envestra's assets is Infomaster which is over 15 years old and is at the end of the technologies 'shelf life'. The version is no longer supported by the industry and the production version has become much harder to support and evolve.

Further to this, it is expected that either a major upgrade of the Smallworld GIS or an application change-out approach will be required in SA and Vic.

This project will form the basis of providing a "National" GIS solution.

4.9.3.5 SCADA Upgrade (Project Ref/No. M&C 003)

Several applications are linked together within the existing SCADA system allowing high volumes of transactions to flow from one to the other. This is necessary to satisfy chapters 2, 3, 5 and 6 of the Queensland Gas Market Retail Procedures and the asset owner's business requirements.

Currently, the existing SCADA server warranty period expires on the 13 May 2011. Once the warranty expires on a server the risk of hardware failure increases due to age. This increases the cost and time to repair and the risk of the application becoming unavailable for a prolonged period of time is high. In some cases it will not be possible to repair the server as the parts will simply not be available. The downtime will almost certainly be increased as the vendor's 24 hour, 7 days a week agreement to respond will not be available. The current policy is to have a planned replacement of servers that come out of warranty. Using extended warranty periods is not recommended as this period may be required as a buffer to transition the SCADA system due to the relative complexity of the systems. Migrating from one server to another can be fraught with issues, particularly where an operating system upgrade is also required (as is often the case).

4.9.3.6 *Knowledge Management*

In the past, APT Allgas has relied on the long term employment of personnel and "on the job" training to support knowledge management and knowledge transfer within the organisation. While this may have been suitable in the past it is not appropriate in the current employment environment, which is seeing a move towards a shorter tenure of employment (typically five to ten years) rather than longer, e.g. 15 years and more. This problem is made worse by the aging profile of the current APT Allgas workforce.

The changing environment in which APA operates necessitates a need to better document the business knowledge held by employees and to develop a more formal process to manage the documentation developed. This project includes the following deliverables:

1. Scoping of the requirements and approach required by APT Allgas to manage knowledge across the business;
2. Documentation of end-to-end business processes of the whole business, much the same as was done for FRC activities, and
3. Development and implementation of a document/records management system.

To drive a consistent core process focus throughout the business, it is necessary that quality (not quantity) of information and knowledge are more easily and effectively utilised in decisions, business processes and projects.

To capture and share this knowledge a two phased knowledge management approach is required, as detailed in the following Table.

Phase	Learn Before	Learn During	Learn After
ESTABLISH	Induction	Communities	Post Implementation Review (PIR)
	Peer Assist	Mentoring	Continuous Improvement
	Delivery Framework	External Knowledge Access	Innovation
	Collaboration, Enterprise Content Management and Communications		
GROW	Motivation Strategy		
	Knowledge Audit	Coaching	Succession Planning
	Lesson Learned Wiki	Expertise Locator	Knowledge Retention
	Collaboration, Enterprise Content Management and Communications		

To support this approach, a robust document management system is also required, along with strong collaboration and searching tools.

4.9.3.7 *IT Application Upgrades and Renewals*

For APT Allgas APA has a complex suite of integrated IT systems, made up of multiple applications, such as:

1. Maximo – Full Retail Contestability (FRC), Works management – installed 2007
2. Control M – FRC, Batch processing – last upgrade 2004
3. Business Process Workflow (BPW) – FRC Middleware – installed 2010
4. WebMethods – FRC Gateway – last upgrade 2006
5. RedBox – Accrual program – installed 2006.

6. CC&B – FRC Metering and Billing – installed
7. Oracle Financials, including inventory – installed 2010

These IT applications are linked together allowing high volumes of transactions to flow from one to the other. This is necessary to satisfy retail market procedures and the APT Allgas business requirements.

Significant IT investment has been made in recent years to ensure that these systems meet the Asset Owner's obligations as set out in the retail market procedures. APA needs to ensure this investment is managed and maintained.

A stay in business program of work has been established to apply minor upgrades to critical business IT applications every three years. The three year duration is in line with prudent industry practice, recommended by application vendors, and is required to ensure:

1. Continuation of IT vendor support;
2. Security and integrity of business information;
3. Stability of IT systems, and
4. Compliance of IT systems.

The programme of work involves upgrade to:

1. Maximo – Full Retail Contestability (FRC), Works management;
2. Control M – FRC, Batch processing;
3. WebMethods – FRC Gateway, and
4. RedBox – FRC Metering and Billing.

4.9.3.8 IT Infrastructure Upgrades and Renewals

Many of these applications are hosted on Windows servers. These servers have been purchased with a warranty that covers support for three years. Once a server is out of warranty the risk of hardware failure increases due to age, particularly for moving parts such as disks and fans. This increases the cost and time to repair and the risk of the application becoming unavailable for a prolonged period of time is high. APA's policy is to have a planned replacement of servers as they become "out-of-warranty".

Underpinning this policy is the need to provide appropriate service levels for infrastructure reliability and availability to support current applications and business processes. The purchase of an appropriate warranty enables APA to provide this. Once hardware is out of warranty APA has no control over the service levels it can provide. Vendors will not guarantee availability of parts and will not guarantee response and fix times. This represents an unacceptable risk from a business perspective.

Rather than just replacing servers on a one for one basis, a review has been undertaken of the IT infrastructure requirements, the changes in technology since the last time the servers were purchased to take account of the latest capabilities and the ability to consolidate servers and reduce overhead costs where possible.

4.9.4 Project Schedule

	Jul-Dec 2011	Jan-Jun 2012	Jul-Dec 2012	Jan-Jun 2013	Jul-Dec 2013	Jan-Jun 2014	Jul - Dec 2014	Jan-Jun 2015	Jul - Dec 2015	Jan-Jun 2016
National Works Management										
Field Data Capture										
Billing Optimisation										
Advanced Asset Management										
Knowledge Management										
CONTROL M U/G										
MAXIMO U/G										
REDBOX U/G										
WEBMETHODS GATEWAY U/G										

SECTION 5 – ASSET LIFECYCLE PLANS

5.1 Asset Lifecycle Management Overview

This section describes the key processes, procedures and controls associated with the lifecycle management of the APT Allgas network assets.

Generically the asset life cycle is defined as:

- Planning and Creation
- Operation and Maintenance
- Removal/Replacement

5.1.1 Planning & Creation Processes

Planning and creation looks at current and future consumer growth and load demands, asset performance and service needs and securing the necessary approvals for network augmentation expenditure. Once approved producing specifications and undertaking the construction, installation and commissioning of network assets.

Planning horizons typically are:

1 Year

Annual network OPEX and CAPEX budgets are developed for the APT Allgas assets by APA Queensland Networks and approved by APA Senior Management/Board. These represent relatively firm requirements for the next year based on actual performance of the network, asset condition, asset age (meters) and forecast growth for the coming year.

5 Year

Strategic CAPEX & OPEX forecasts are prepared a 5 year period.
This 5-year plan is reviewed annually to maintain a rolling 5-year forecast for budgeting purposes.

10-20 Year

Cost benefit analysis of network extensions (domestic and I&C) and mains replacements are based on either 10 or 20 year forecast projections of connection, utilisation and maintenance expenditure.

The following controls assure quality (and prudence) in the planning and creation of assets:

1. Design Process Controls (Design, Check & Approve)
2. Configuration/Change Management Manual
3. Project Management Manual
4. Risk Assessment Manual (Major Projects)
5. Asset policies, procedures, standards and specifications.
6. Standard Materials & Component Specifications
7. Testing, Inspection & Commissioning policies & procedures
8. Appropriately skilled and experienced personnel

5.1.1.1 Key Financial Controls

Network asset creation, like in any business, must be subject to appropriate cost controls. The following financial controls ensure that creation of assets only occurs in accordance with established prudential approval processes:

1. All domestic mains extensions, I&C connections and mains replacement projects are based on documented customer requirements and evaluated using a NPV based model that compares cost and benefit over time.
2. Standard Financial Models, controlled by the APA Commercial Group, are used for assessment of all network CAPEX projects.
3. All CAPEX projects are subject to the preparation of a formal business case/justification requiring senior APA management approval.
4. Projects less than $500k are approved by the APA General Manager - Networks, provided the projects are in the approved annual budget and satisfy the required rate of return criteria.
5. All projects in excess of $500k require senior APA management approval.
6. Projects in excess of $1m require APA Group Board approval.
7. APA Queensland Networks reports to senior APA management monthly on progress against capital budget and progress for all capital projects approved.

5.1.2 Operation and Maintenance

The APT Allgas Energy Pty Limited approach to network operation and maintenance is detailed in the APA Queensland Networks Safety and Operating Plan for APT Allgas Networks.

Operation and Maintenance involves three principal sub-processes:

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

The following data collection occurs in each sub process to assist in making asset management decisions:

1. Network Surveillance & Monitoring
   - Telemetry pressure point and demand customer monitoring
   - Pressure monitoring using chart recording
   - Pipeline patrol and inspection
   - Cathodic protection monitoring
   - Coating survey
   - Leak Survey
   - Inspection of special crossings
   - Odorant monitoring
   - Gas quality monitoring (network perimeter odorant “Sniff” tests)
2. Preventative maintenance to reduce the probability of failure:
   - Regulator maintenance
   - Valve maintenance
   - Cathodic protection maintenance

- Telemetry system maintenance
- Meter maintenance (I&C)
- Periodic Meter Changes
- Maintaining a "Dial Before You Dig" Service

3. Corrective maintenance in response to failures:
   - Repairing leaks
   - Repairing third party damages
   - Clearing water ingress and system blockages
   - Providing standby and emergency callout
   - Resolving metering problems/failures
   - Repairing cathodic protection system faults
   - Repairing pipe coating failures/faults
   - Fault-finding on pressure regulating installations

Maintenance of assets is undertaken to ensure that physical assets continue to fulfil their intended functions (performance levels) within an expected life time.

To ensure these intended functions are maintained, maintenance standards for differing asset types are determined using the following criteria:

- Asset type and age
- Location and operating environment
- Importance of function
- Manufacturers recommendations
- Asset history
- Industry experience
- Condition monitoring
- MHQ of metering facilities

The objective is to ensure that all statutory and legal obligations are adhered to and that network performance is maintained to performance levels as agreed with the asset owner at optimal costs.

The APA Operating Procedures Manuals detail minimum requirements for the maintenance and condition monitoring of the following:

- Transmission Pressure Pipelines
- High pressure mains and services
- Medium and low pressure mains and services
- Gate stations
- Pressure reducing stations
- Meter Stations

They detail the frequency and scope of work to be carried out and are used in conjunction with the relevant codes of practice and equipment manufacturer's instructions.

These procedures also cover:

1. Monitoring the condition of pipeline easements, signage and above ground facilities.
2. Identifying threats to the safety of the pipeline and its ongoing reliable operation.
3. Controlling corrosion in accordance with applicable standards.

4. Monitoring the condition of coatings for both buried and above ground pipe work and structures.
5. Identifying leaks.
6. Ensuring accuracy and reliability of instrumentation associated with measurement of gas flow, monitoring of pipeline conditions, and controlling operation.
7. Ensuring reliable operation of pressure control and pressure relief equipment, Emergency Shut Down and Slam Shut Valves, isolation valves, heaters, filters and other ancillary equipment to design specifications.
8. Testing the effective operation of electrical protection equipment and the adequacy and condition of electrical earthing systems.
9. Inspecting pressure vessels and pig traps for both internal and external corrosion and defects, and the condition of quick acting closure mechanisms and seals.
10. Carrying out special inspections of underwater pipelines, tunnels, casings, foreign crossings, and special zones identified as requiring specific inspection and monitoring.

Operation & Maintenance practises are audited by internal APA audits using external auditors and the DME/DWE. Regional licensed pipelines and networks are regularly audited by APA and DME/DWE for compliance with the licence conditions and AS2885.3 and AS4645 Parts 1, 2 and 3 requirements.

5.1.3 Remove/Replace

The processes of replacing network assets that have reached the end of their technical or economic lives include. It includes the process of removing from service and disposal of physical network assets and the refurbishment of assets to extend their useful life.

Examples are:

1. Replacing mains and services
2. Replacing or refurbishing meters and meter assemblies
3. Replacing or rebuilding pressure regulating installations
4. Replacing or refurbishing ancillary equipment (telemetry, anodes, etc)

The process of network asset replacement is driven by the prudent balance between ‘avoided future cost of maintenance’ and current replacement cost. Those assets which are approaching the end of their technical lives or experience unanticipated deterioration in condition are identified for replacement and prioritised in a manner that ensures an efficient and cost effective allocation of resources. The principal asset groups that are systematically replaced include distribution mains (cast iron, and unprotected steel) and associated services, domestic and industrial/commercial meters.

The monitoring of trends in maintenance requirements allows the replacement rate to be adjusted as required. Long-life assets such as pipelines deteriorate slowly allowing time to identify priorities and undertake renewals.

The following controls assure quality in the process of removing/replacing assets:

1. All mains replacement work is approved by senior management as per defined approval limits.
2. Periodic Meter Changeover schedules are managed through the Works Management System (Maximo).

5.1.4 Asset Performance Indicators

The following table describes a range of Performance Indicators (PI's) used for the various asset groups. Performance Indicators are used by the relevant operating departments with Key Performance Indicators (KPI's) reported to senior management.

Asset Group	Performance Indicators (PI's)	KPI's
Transmission Pipelines	• % of pipeline patrolled • No. of coating faults/km • No. leaks reported & repaired • CP Survey Readings • Coating Survey Results • Emergency exercises completed	• No. of 3rd party damages • No. of 3rd party damage near misses
Pressure Regulating Installations	• % PM Schedule Complete	• No. of PM jobs scheduled but more than 1 month overdue
Distribution Mains & Services	• No. leaks reported & repaired • No. of outstanding leaks • No. of services replaced • Poor supply incidents/outages • No. of over pressurisations • No of 3rd party locations • CP Survey Readings • Km of mains laid • Km of mains replaced • No of services Laid • No of services replaced • Emergency exercises completed	• Leaks/km main surveyed • No. 3rd Party Damage. • Supply Outages to 5 or more consumers • No. of gas in building incidents • No. of fires as result of gas leak • Onsite response to emergency within prescribed time
Meters	• No. of inaccurate meters detected • No. of meter failures • No. of time-expired meters replaced • No. of meter leaks • % of PM Schedule complete • No. of meters replaced per annum	• No. of PM jobs scheduled but more than 1 month overdue
Telemetry Systems	• Availability of telemetry systems	
Corrosion Prevention Systems	• % TP Protected by CP • % HP/MP/LP Network Protected by CP	• % of CP test points checked • % of test points outside tolerance • % of regulatory odorant surveys conducted
Odorant Facilities	• Emergency exercises completed	• Odorosity < 20% LEL

5.2 Transmission Pipeline Life Cycle Plan

5.2.1 *Transmission Pipelines Overview*

These steel pipelines are the principal supply to the low, medium and high distribution sub networks. In some cases they are the primary supply to major industrial consumers.

APT Allgas Energy Pty Limited operates and maintains over 462 kilometres of steel pipelines working at Transmission pressures in Queensland of which over 255 km are in the Brisbane district, 158 Kms are in the South Coast districts and just over 48 kms are capable of working at these pressures in the Western districts. These pipelines are split into "Classified" Pipelines and Local High Pressure Steel Pipelines (See 6.2.5 below)

There is a 985 metre 3 inch diameter Class 900 steel pipeline supplying natural gas to a single industrial consumer in Moura, North Queensland.

It is a requirement of the Queensland Petroleum and Gas (Production and Safety) Act 2004 that all pipelines with a Maximum Allowable Operating Pressure (MAOP) greater than 1050 kPa are designed, constructed and operated to AS 2885.

The growth in transmission pressure pipelines is driven by major projects such as extending supply to new districts and major industrial consumers or augmenting capacity in line with growing demand from existing networks. The following table summarises the age profile of the APT Allgas Energy Pty Limited "Classified" pipelines (MAOP >1050) pipelines only. The remaining 'Local High Pressure Steel' pipelines fall into the 25 to 40 years old bracket.

Age	Km's	%
30-40	7.019	3.47
20-30	11.39	5.63
10-20	116.138	57.41
0-10	67.764	33.49
Total	202.311	100%

5.2.2 *Asset Performance, Condition & Integrity*

5.2.2.1 Asset Performance

Asset capacity performance is monitored on an annual basis with the transmission pipeline capacity reported in the Capacity Management Plan. The ongoing residential development along the south coast will necessitate the capacity of this main to be increased or augmented in line with increasing network demand.

5.2.2.2 *Asset Condition*

The transmission pressure pipelines are operated and maintained in accordance with the Safety and Operating Plan for APT Allgas Classified Pipelines in Queensland.

The condition and integrity of the transmission pipeline assets are monitored by:

- Weekly Patrols
- 5 Yearly MAOP Review as per requirements of AS 2885.1, AS2885.3 Section 8 and Appendix D.
- 5 Yearly DCVG Coating Surveys
- Approved Engineering Investigation at the end of the pipeline design life (21 years) as per AS2998.3 clause 8.5
- 5 Yearly Safety Management Studies (formerly Risk Assessments) as per requirements of AS2885.3

The configuration of the transmission pipelines is such that internal "pigging" inspections are not possible on all but one 200mm Class 600 pipeline.

Coating surveys have been limited to new installations at the time of construction. Existing pipeline DCVG surveys are programmed to occur in line with the MAOP Review schedule.

The following table summarises planned AS2885 reviews of APT Allgas Energy Pty Limited "Classified" Pipelines in Queensland.

	2010	2011	2012	2013	2014	2015	2016	2017	2018
MAOP Review	5	5	12	9	3	5	5	12	9
Safety Management Studies	5	5	12	9	3	5	5	12	9
Coating Survey	5	5	12	9	3	5	5	12	9
AIE	4	2			1		1	1	1

To date no "dig ups" on steel transmission pressure pipelines have been carried out however a number are expected as result of Coating Surveys planned over the next 5 years. A provision has been made in the budget to carry included to carry out this work.

5.2.3 Growth

Transmission pipeline growth is governed by infrastructure changes and growth in demand from both residential and industrial development within financially viable distance of the existing networks.

Augmentation of the Class 600 "South Coast Pipeline" has been carried out over the last 5 years to increase capacity with further upgrades planned over the next 5 years in line with projected growth forecasts.

5.2.4 Operation & Maintenance

The maintenance strategy for Transmission pipelines is driven by the critical nature, both in terms of gas supply and potential for catastrophic failure, particularly where pipelines are located in or near busy roads and/or through built up areas.

The physical and procedural measures in place for managing these threats are summarised in the table below:

Threat	Protective Action
Corrosion	1. Protective coatings 2. Cathodic Protection 3. Electrical Surge Protection
Floods/Subsidence	1. Depth of Cover 2. Pipeline patrols 3. One Call System (DBYD)
External Interference	1. One Call System (DBYD) 2. Signage and marker tape 3. Pipeline patrols 4. Community liaison 5. Response to other authorities' works 6. Permit to work system 7. Location and supervision services 8. Depth of Cover 9. Pipe protection / shields

In recognition of changes in the environment, e.g. urban encroachment, the threats to pipelines are regularly assessed and appropriate measures taken to mitigate risk of damage.

A formal risk assessment of transmission pipelines is carried out every 5 years as per requirements of AS 2885.3 – 2001, Pipelines – Gas and Liquid Petroleum Operation & Maintenance.

The maintenance strategy for transmission pipelines includes:

- Pipeline Patrols - Weekly
- CP Survey – Half Yearly Surveys
- CP Impressed Current Circuit Check – Annually
- DCVG Coating Survey – 5 yearly
- Integrity excavations – Ad Hoc
- Leak Survey – Annually
- Vegetation Management – Continuous program
- In line Valve Inspections – Every 12 months

An internal review of Operation & Maintenance activities carried out on transmission pressure steel pipelines in the APT Allgas Queensland assets included patrolling, permits to work, site watch services, CP surveys, DCVG Surveys, leakage surveys, vegetation management and valve inspection & maintenance.

The review indicated that although preventative maintenance was being carried and the pipelines were generally maintained in a safe and appropriate manner traceable records were an issue. In response to this a full schedule for all the reviewed activities using the new Maximo Works Management System to program all those activities with results and observations entered from hard copy records into the local AMS asset database. The optimisation of preventative maintenance process and systems across APA's gas network management portfolio has been identified as a major priority over the next 12 months.

5.2.5 Replacement/Upgrade/ Abandoned

An audit of the Allgas Safety and Operating Plan by the Queensland DME Gas Inspectorate in 2002 identified that there were steel pipelines within the networks that qualified for AS2885 Reviews which meant that there was a requirement to carry out MAOP, Pipeline Risk Assessment and Location Class Reviews of all Class 150 and above steel pipelines in all of the APT Allgas Energy Pty Limited Networks.

Investigations over the following 18 to 24 months revealed there was insufficient documentary evidence to enable AS2885 reviews of many of the pipelines laid prior to 1987. A panel of suitably qualified Allgas engineers reviewed all the steel pipelines for which there were no documentary evidence to provide traceability of materials, design of each pipeline, non destructive and hydraulic testing results or proof of procedural external interference protection measures throughout the operational lifetime of each pipeline. Most of these pipelines had been constructed anywhere from the time of conversion (1969) through to 1987 when the South Coast Pipeline was laid and full documentation set a precedence for all future steel pipelines laid by Allgas Energy P/L.

Each review considered the existing and future demands and location of each pipeline and where possible down graded those pipelines to “Local High Pressure Steel” pipelines which would in the future be limited to a maximum operating pressure less than 1050 kPa. The remaining pipelines that would be subjected to AS2885 Reviews were then identified by Allgas as “Classified Pipelines” and generally were Class 300, 600 and 900 laid under AS2885 requirements.

5.2.6 Risks/Issues/Actions

Item	Risk/Issue	Risk/Issue Detail	Current Controls	Risk Rating	Additional Control Options	Doc Ref No.
1	Sleeved Crossing Corrosion	A safety review in 2009 identified steel mains within sleeved railway crossings as being at particular risk of corrosion due to the damp environment within the annular sleeve space and the lack of electrical connectivity to the surrounding soil making cathodic protection ineffective.			See Section 3.2.3.1 for detailed description of current actions.	Q40
2	Valve Maintenance Backlog	A number of the transmission valves are overdue for servicing	Monthly KPI reporting	Mod	Prioritise clearing backlog during FY 10/11	
3	Maintenance Management System	A mix of maintenance management systems makes the monitoring of activities difficult.	Monthly KPI reporting	Low	The upgrade to a national version of Maximo as part of the RMI initiative will provide a common and consistent platform from which to manage maintenance activities	Q19
4	CP Database	This is a custom built data base which does not comply with the National strategy of using one APA Works Management System for Preventative and Condition Assessment.		Mod	To be included as part of the implementation of the upgrade Maximo WMS	Q19

5.3 Transmission Pipelines Facilities Life Cycle Plan

5.3.1 Overview

Facilities associated with Primary Supply Mains are typically Gate Stations. Gas is delivered into the APT Allgas networks via 12 Gate Stations of which 10 are owned by APT Allgas, 1 by the upstream pipeline owner and 1 by Envestra.

These sites typically comprise of:

1. Filtering equipment,
2. Regulation equipment,
3. Metering equipment,
4. Valves,
5. Telemetry equipment
6. Odorising equipment.

APT Allgas is responsible for odorising the gas carried through its networks as part of its haulage service. The objective of this is to provide a distinctive odour to the natural gas that satisfies the legislative requirement where the detectable odour level in the gas is required to be at 20% of the lower flammability level.

There are 11 odorisation facilities within the APT Allgas Energy Pty Limited Networks. The installation at Moura odorises the gas as it passes through the metering installation which means that the Class 900 service operated and maintained by APA Queensland Networks is not odorised. The odorisation sites are summarised in the following table:

Name	Location	Type	Plant Age	Owner	Storage Capacity (Litres)
Oakey	Oakey Gate Station	Evaporative	10+	APA	50
Toowoomba	Toowoomba Gate Station	Evaporative	10+	APA	50
Willawong	BCC NGV Compressor Station	Pneumatic Pump	1	APA	200
Ellen Grove 1	Ellen Grove Gate Station	Evaporative	10+	APA	50
Ellen Grove 2	Ellen Grove Gate Station	Electric Pump	2	APA	200
Runcorn 1	Runcorn Gate Station	Pneumatic Pump	2	APA	200
Runcorn 2	Runcorn Gate Station	Pneumatic Pump	2	APA	200
Mt Gravatt	Mt Gravatt Gate Station	Pneumatic Pump	7	APA	200
Tingalpa	Tingalpa Gate Station	Pneumatic Pump	6	APA	200
Doboy	Doboy Gate Station	Evaporative	9	APA	50
Moura	Moura CT Station	Electric Pump	9	APA	>200

5.3.2 Asset performance, Condition & Integrity

All Gate Stations are inspected every week to ensure that they are not interfered with in any way and do not deteriorate to the point where they are not able to perform in a safe and appropriate manner and be able at any time to meet peak demand conditions.

There have been no recorded failures during the lifetime of these assets and generally equipment is maintained on a programmed basis. All the scheduled activities are programmed using Maximo with results and observations entered from hard copy records into the local AMS asset database as they occur.

5.3.3 Growth

There are no new facilities planned over the next 5 years

5.3.4 Operation & Maintenance

All gate station units are checked monthly. In addition to this all have telemetry which provide information on odorant dosage rates and that the pump is working.

The strategy over the next two years is to ensure odorisation facility locations have:

- All plant operating with an upgraded telemetry system;
- Critical pump spares available, and
- Standard odorant flowmeters at each pump site.

Odorant surveys of the network perimeter are a further check that all odorisers are operating correctly. These surveys are carried out monthly in the Brisbane network and 3 monthly in regional networks.

Measurements over the last 12 months have confirmed odorant levels have been within prescribed limits.

5.3.5 Replacement/Upgrade/Abandonment

The replacement of several older odorisation units with new ones as a part of the Gate Station replacements or upgrades are included in the augmentation projects listed in the section detailing all CAPEX proposals.

A new odorisation unit is to be installed at the Toowoomba Gate Station.

5.3.6 Risks/Issues/Actions

In July 2009, Envestra Limited engaged GPA Engineering Pty Ltd to conduct a technical audit to identify and examine management practices utilised by APA to ensure that odorisation of natural gas transported in Envestra's distribution networks meets appropriate standards and regulations. As all odorisation activities carried out in accordance with the APA Queensland Networks Odorising Manual are applicable to both APT Allgas as well as Envestra odorising units, the results of this audit have a similar impact on the APT Allgas odorisation activities.

The audit concluded that odorisation activities are well managed in accordance with the Queensland Odorising Manual. The audit identified 8 low risk and 2 moderate risk issues which are now included along with operational risk issues as items 9 to 18 in the table below.

These recommendations have been assigned to appropriate personnel with status and completion tracked via MARCIS. The majority of these were actioned during FY 09/10 with all actions scheduled for completion by the first half of 2010/11.

The following table summarises the key issues/risks associated with odorising facilities:

Item	Risk/Issue	Risk/Issue Detail	Current Controls	Risk Rating	Additional Control Options	Project Ref. No.
1	Over Odorisation	Increased cost of odorant. More reported leaks	Telemetry dosage rates. Network Perimeter testing	MEDIUM		
2	Under odorisation	Non compliance to Regulations. Possible hazard	Telemetry dosage rates Network Perimeter testing	low		
3	Spills and leaks	Environmental and public safety impacts	Procedures and training Emergency response exercises	low		
4	Manual Handling	Handling and transporting odorant	Operator Training and procedures. Custom built equipment	MEDIUM		
5	Isolated work locations	Working with odorant in remote locations	Operator training and procedures	MEDIUM		
6	Odor fade	Localised fading occurs at end of pipelines in areas of low demand, in new pipelines that have not been conditioned or in presence of moisture and oils	Monitoring odorant levels	low	Increase dosage if necessary	
7	Odor masking	Odor masking occurs in old mains that contained significant residues of coal tars or similar	Monitoring odorant levels	low	Increase dosage if necessary	
8	Deterioration of stored odorant at evaporative sites	Odorant becomes less effective if stored for long periods of time	Monitoring odorant levels	low	Replace odorant if necessary	
9	Documentation	Cross-reference Section 2.1 Geographic Coverage and Section 2.1.1 Envestra Natural Gas Networks to Envestra network maps (Appendices 1 – 6) in the Safety Management Plan as appropriate.		low		
10	Documentation	Identify sources of natural gas supplying Envestra's Networks in the Safety Management Plan.		low		
11	Documentation	Include references to the key management system document "Odorising Manual" in the Safety Management Plan.		low		
12	Documentation	Include a register of Key Risks in the SMP which acknowledges that gas odorisation presents a key safety risk which can adversely impact gas consumers and the general public.		low		
13	Documentation	Regularly test odor levels at strategically selected locations within all networks. Amend the Odorising Manual to reflect this requirement.		MODERATE		
14	Documentation	Amend the Odorising Manual by including a requirement to periodically test network gas odor levels using a gas chromatograph.		low		

Item	Risk/Issue	Risk/Issue Detail	Current Controls	Risk Rating	Additional Control Options	Project Ref. No.
15	Documentation	Queensland's Odorising Manual incorporates a requirement for periodically reviewing odorisation monitoring programs which provide for established and newly constructed network areas and any known high risk areas/locations. It is further recommended that APA also records: • The principles it uses to select sampling points and frequencies. • The technical reasons why these points and frequencies were selected. • Who was responsible for selections made?		MODERATE		
16	Documentation	Consider amending the Odorising Manual to incorporate internal monitoring, auditing and reviewing procedures similar to those that are applied in South Australia.		low		
17	Documentation	Amend the Queensland Monthly Management Report's Odorant Control KPI's to include the number of odorant excursions that warranted action.		low		
18	Documentation	Include a brief summary of odorisation (and gas quality) performance and any issues in the Queensland Distribution System Performance Review annual report.		low		

5.4 Distribution Mains & Services Life Cycle Plan

5.4.1 Overview

APA Queensland Networks operates approximately 2,943 km of APT Allgas Energy Pty Limited distribution mains in the Queensland and Northern NSW networks. The table below summarises the gas assets making up these networks by District and pressure regime as at July 1 2010. (Numbers are in metres of pipe).

Network	TP	HP	MP	LP	Totals
	>1050 kPa	400-1050kPa	7-200 kPa	< 7 kPa	
Brisbane	254,334	730,557	436,868	294,856	**1,716,614**
South Coast	157,522	470,584	-	214	**628,321**
Northern New South Wales	-	32,562	-	270	**32,832**
Toowoomba	48,294	477,806	2,075	110	**528,286**
Oakey	6,998	29,136	-	-	**36,133**
Moura	1,209	-	-	-	**1,209**
Totals	**468,357**	**1,740,645**	**438,943**	**295,450**	**2,943,395**

All new distribution mains are constructed using polyethylene pipe and between 40mm and 200mm in diameter with occasional use of suitably sized poly coated steel for higher pressure situations.

Typically new services to domestic customers are either 10mm - 20mm diameter Polyethylene with occasional use of Nylon pipe and 20mm-25mm diameter copper pipe.

5.4.2 Asset Performance, Condition & Integrity

There are significant lengths of cast iron and unprotected steel mains (464 km) in Brisbane suburbs south of the Brisbane River. Those mains are at the end of their economic lives resulting in a high level of UAFG, high maintenance costs, safety issues related to gas escapes and insufficient capacity to meet customer demands. Renewal of the existing mains which are in poor condition is necessary to ensure that the natural gas distribution networks can continue to be safely and economically operated into the future.

It is estimated that these mains are between 40 and 90 years old. The remaining life of these mains is difficult to predict with a number of variables such as soil type, make of pipe, age, construction standards, proximity to trees and traffic loads affecting the mains useful life.

Leaks from the cast Iron (CI) mains are predominantly from mechanical joints, a legacy of the dry nature of natural gas compared to the “wet” reformed gas used when these assets were first installed. In areas where CI mains have been laid in clay the acidic

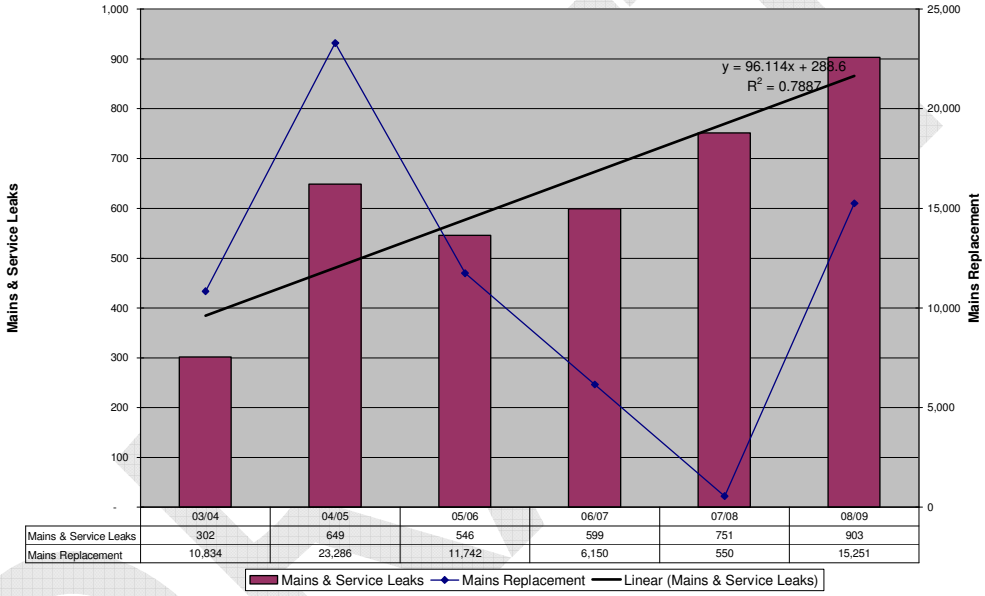
nature of these soils leads to graphitisation of the main leaving it susceptible to cracking/breaking potentially resulting in a major gas escape.

Leaks from unprotected steel (UPS) mains are due to external corrosion of the pipe. Extensive pitting corrosion along the pipe length with replacement, rather than repair, the best option is common.

A significant component of the APT Allgas OPEX relates to locating and repairing gas leaks. Leaks are also a major contributor to UAFG, adding to APT Allgas's cost of providing network services.

5.4.2.1 *Distribution Mains & Service Leaks*

The following graph summarises the trends in identified leaks in old low and medium pressure networks of Brisbane over the 03/04 to 08/09 period.



	03/04	04/05	05/06	06/07	07/08	08/09
Mains & Service Leaks	302	649	546	599	751	903
Mains Replacement	10,834	23,286	11,742	6,150	550	15,251

Leaks numbers shown in this table are leaks reported by public and leak survey crews that are related to failures of the distribution network and are not directly related to third party damages.

There has been an increase in mains and service leaks in Brisbane despite on average 17 km/yr of mains replaced during this period.

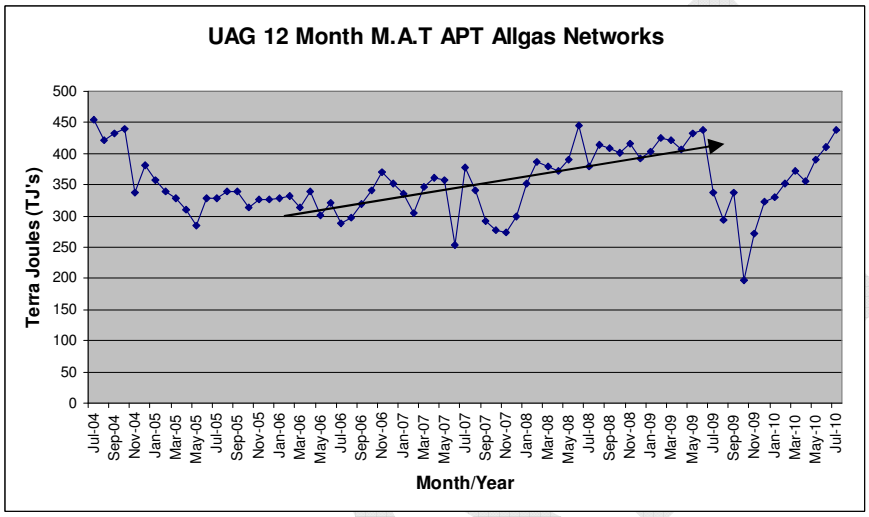
There appears to be an inconsistency in escalation in leaks between FY 03/04 and FY 06/07 and a corresponding 42% reduction of UAFG during this period. Changes to reporting processes and systems during this time may have influenced these trends.

5.4.2.2 *UAFG*

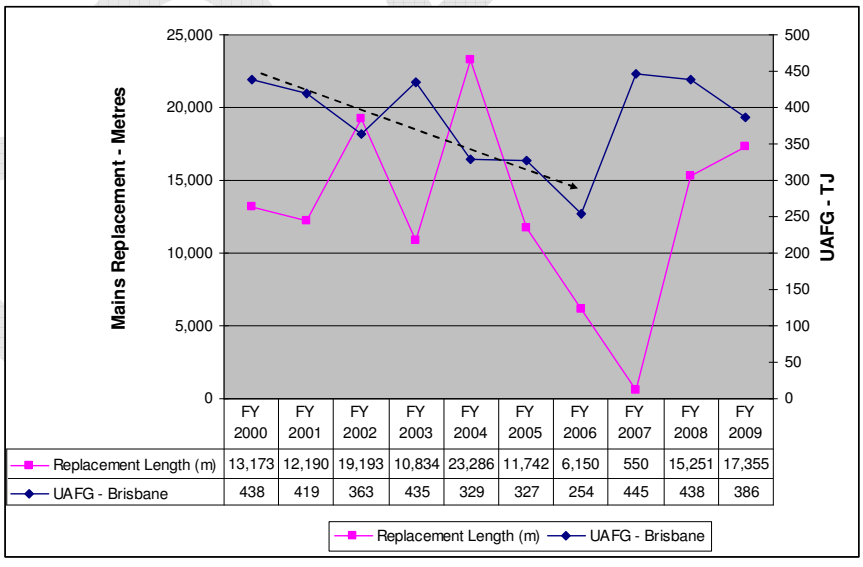
Current un-accounted for gas investigations indicate that metering errors only relate to a small proportion of the overall UAFG and therefore a greater proportion of the remainder is related to leakage within the networks.

The volume of gas lost through leaks is determined using data related to the recorded un-accounted for gas and estimates based on field investigations including night flow studies.

The following graph gives an indication of how UAFG has varied over the last six years.



The graph below details MAT UAG for the Brisbane Region from July 2000 to July 2009.



	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Replacement Length (m)	13,173	12,190	19,193	10,834	23,286	11,742	6,150	550	15,251	17,355
UAFG - Brisbane	438	419	363	435	329	327	254	445	438	386

It is estimated that the CI & UPS mains are contributing about 700 GJ/km/yr to the total UAFG.

During the 6 year period from 2000 the replacement strategy focussed on replacing mains with the highest incidence of leaks and UAFG. During this period, on average, 15 km/yr of CI & UPS was replaced with a commensurate reduction in UAFG of about 180 TJ's.

During the 4 year period from 2006 the increase in UAFG correlates to the reduction in mains replacement with, on average 9.6 km/yr replaced. The reduction in replacement was associated with capital constraints during this period.

5.4.2.3 *Supply Integrity Issues*

Details of capacity performance and network augmentation requirements are provided in the Capacity Management Plan. A summary of issues has been included in Section 4.5 of this AMP.

5.4.3 Growth

The following Table summarises actual and forecast distribution mains and services growth.

	Actual		Forecast					
	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16
New Service - New Home (No.)	3,174	2,908	2,833	2863	3114	3277	3472	3680
New Service - Exist Home (No.)			633	949	1030	1102	1147	1175
New Service - Multi User (No.)			850	1028	1243	1503	1697	1917
New Service - I&C < 10 Tj (No.)	129	175	192	150	160	170	180	190
New Service - I&C > 10 Tj (No.)			0	1	1	1	1	1
New Main – Estate (m)			39,662	40,088	43,601	45,884	48,612	51,516
New Main - Existing Domestic (m)			12,519	13,510	14,688	15,507	16,372	17,238
New Main - I&C < 10tj (m)			7,768	6,069	6,474	6,878	7,283	7,687
New Main - I&C > 10tj			X	X	X	X	X	X
New Main – Improving Supply			X	X	X	X	X	X

5.4.4 Operation & Maintenance

The APA Operating Procedures Manuals detail minimum requirements for the maintenance and condition monitoring of the following:

- Transmission Pressure Pipelines
- High pressure mains and services
- Medium and low pressure mains and services
- Gate stations
- Pressure reducing stations
- Meter Stations

They detail the frequency and scope of work to be carried out and are used in conjunction with the relevant codes of practice and equipment manufacturer's instructions.

A frequency schedule for key preventative maintenance activities is shown at the end of this document.

Leakage Surveys are carried out to ensure that the gas assets operated and maintained by APA Queensland Networks are constantly monitored within frequencies that are acceptable to legislative requirements to identify gas leakage so that it might be managed before it presents a serious hazard to people and property.

The APA Leak Management Plan (LMP) outlines the process for managing gas leaks. The process ensures that leaks from the gas network are identified, responded to and classified in a consistent manner, and that the process is monitored effectively by the business, in order to ensure that:

- Risk to the public is managed to a level as low as reasonably practicable;
- Regulatory and Australia Standard requirements, as well as internal requirements are understood and implemented, and
- The life of the network asset is managed effectively through timely leak repair and periodic survey.

Leak Management includes all the following criteria when carrying out data analysis and determination of suitable action plans:

- Safety of the general public, employees and protection of property and the environment;
- Asset type and age;
- Location and operating environment;
- Importance of function;
- Manufacturers recommendations;
- Asset history;
- Industry experience;
- Local knowledge, and
- Current UAFG strategies.

Reassessment of Survey frequencies is carried out annually and a program set for 12 months along with a general update of the anticipated 5 year plan.

A Dial Before You Dig (DBYD) service is maintained to mitigate the risk of third party damage. This service continues to be promoted and over the last few years its use has been increasing. Annual growth in the number of calls is expected to grow by at least about 5%. The following Table summarises the historic and future volumes. An automated DBYD service is scheduled to start in the FY 10/11 to accommodate the increases and response times are expected to be >95% when fully commissioned.

	Actual				Forecast					
For Year	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Total Number of Calls	17,854	18,234	18,825	21,765	24,000	25,200	26,460	27,780	29,170	30,630
Response within 48 hrs - %	97%	95%	99%	95%						

5.4.5 Replacement/Upgrade/Disposal

5.4.5.1 Mains & Services Replacement Process

Details of the mains replacement process are included in the Queensland Mains Replacement Strategic Plan.

Replacement programmes include:

- Replacement of single mains lengths and associated services (like-for-like or with pressure upgrade).
- Replacement or relocation of mains in conjunction with council or other authorities' works programs.
- Planned Block renewal mains and associated services (reduced diameter and pressure upgraded).

The replacement of distribution mains is usually conducted to the high-pressure standard utilising mains and service insertion technique and upgrading to HP wherever possible. This approach:

- Minimises renewal costs and disruption to the community by using mains and service insertion techniques wherever possible.
- Eliminates the recurring problem of water ingress into the low-pressure network.
- Provides additional capacity to address high instantaneous gas load appliances being installed in established areas.

5.4.5.2 Planned Mains Renewal

To ensure network integrity is maintained it is proposed to replace the remaining CI & UPS mains within the Brisbane APT Allgas Networks. This has been detailed in the Mains Replacement Strategic Plan.

5.4.5.3 Piecemeal Renewals

Mains renewals are performed on a "reactive" piecemeal basis as a means of overcoming leakage problems or localised cases of water ingress into mains.

Subject to the condition of the existing mains, it is sometimes found that conventional repairs are either not possible or are economically not feasible due to there being multiple leaks in a localised area or the main being so corroded that future leaks are inevitable. In these cases piecemeal mains renewal is adopted with short sections of mains being replaced. Piecemeal mains renewals are typically in the order of 100 metres or less in length. This short length combined with the fact that direct burial, rather than insertion, is often required results in a higher unit cost relative to planned "block" renewals, which are normally carried out using insertion techniques.

Typically 2 km/yr of piece renewals is budgeted for and it is recommended that this continues over the next 6 years.

5.4.5.4 Inlet Service Renewals

There are cases where inlet services need to be renewed on a stand-alone basis (unrelated to mains renewal works). The need for such inlet service renewals arise when leaks or damages occur on the inlet service and inspection reveals that the service is heavily corroded or in such poor condition that repairs are not viable. In such cases, the service is replaced.

Based on historical trends, where the average number of individual service renewals was around 150 per year, it is estimated that approximately 300 inlet service renewals will be required over the next 3 years reducing to about 240 during the subsequent 3 years due to the impact of the proposed planned mains replacement programme.

5.4.6 Risks/Issues/Actions

The principle issues and risks with the distribution network have been detailed in the Mains Replacement Strategic Plan and the Capacity Management Strategic Plan with a summary of these Plans is included in Sections 4.5 and 4.6 of this AMP.

The principle issues are increasing UAFG and deteriorating condition and integrity of the CI & UPS mains, principally in the LP network. In addition, the increasing use of high demand appliances and urban consolidation has constrained capacity in sections of the LP network.

A number of additional operational risk issues have been raised and are summarised in the following Table.

ASSET RISK MANAGEMENT PLAN - APT ALLGAS ENERGY PTY LTD DISTRIBUTION NETWORKS

	Risk Identification and Assessment							Risk Treatment Plan					
No.	Asset	Location	Risk Description	Highest Risk Consequence Rating	Highest Risk Likelihood Rating	Highest Risk Inherent Level	Highest Inherent Risk Score	Budget Priority	Risk Treatment	Highest Risk Level A/T	Highest Risk Score A/T	Total risk treatment cost ($Real 2010/11)	Number of years for risk treatment	Status
1	Cast iron and unprotected steel low and medium pressure networks	Brisbane South , Wynnum and Sherwood	There are approximately 400km of old cast iron and unprotected steel mains that are at the end of their technical and economical life with ongoing leaks, water ingress, and with no sufficient gas supply capacity and reliability to meet current customer demands. Asset condition is continuously worsening. Leaks creating safety risk for public, financial loss is related to high unaccounted for gas and maintenance costs. There are and supply interruptions, poor supply pressures, environmental impact, not sufficient capacity to meet future customer demands and other risks including impact on APT Allgas reputation.	Major	Unlikely	High	14	2	Complete block renewal of all 400km of existing cast iron and unprotected steel mains, including approximately 40km of existing PE mains in poor condition, services in poor condition and upgrade customer metering stations over 25 years period. Increase network operating pressure from 20kPa for MP and 1.6kPa for LP to 200kPa. Schedule work to optimise network financial performance in accordance with asset owners financial capability.	Moderate	6	92,400,000	25	In progress with plan to be completed by winter 2035
2	DN150 Class600 Pipeline	From Brisbane to Gold Coast	Existing DN150 class 600 pipeline supplying South Coast Region has no capacity to support ongoing growth in customer demand. Based on forecast pressure profiles for critical supply points, this pipeline will be not able to meet required minimum supply pressures for Molendinar and Reedy Creek off-takes in winter 2016, Additional issue is and security of supply related to potential major failure of this pipeline. First stage of reinforcement of this pipeline was completed in 2006 with construction of 12.4km long DN200 Class 600 pipeline from Ellen Grove Gate Station to Browns Plains.	Major	Unlikely	High	14	2	As a second stage of reinforcement of supply to South Coast Region construct new 10.2km long, DN200 class600 pipeline from Browns Plains to Logan Reserve before winter 2016. Third stage will include further 12.9km long DN200 Class 600 pipeline extension from Logan Reserve to Yatala. Timing of third stage will be reviewed later because it is directly related to gas market growth in the South Coast Region.	Moderate	6	16,170,000		Stage 2 with 10.2km of DN200 class 600 pipeline construction planned to start in 2013/14 and to be completed before winter 2016 with total estimated cost of $7.14M Real 2010/11.
3	Mains and services	All	Reported leaks from mains and services creating safety risk for public, financial loss related to unaccounted for gas, regulatory obligation to repair reported leaks, environmental impact.	Severe	Possible	High	13	2	Complete peace renewal of faulty mains and services to minimise risk exposure to public in situations where repair is not possible or not cost effective.	Low	5	300,000	Continuous	Average estimated cost per year
4	Metering Stations	All	There is regulatory requirement for meter changing and testing as per Petroleum and Gas (Production and Safety) Act. If we do not comply with this requirements there is potential for loss of Licence, significant financial penalties and prosecution.	Severe	Possible	High	13	2	Implement Periodic Meter Changing Program as per Gas Measurement Plan	Low	2	1,000,000	Continuous	Average estimated cost per year
5	Gate Station	Tingalpa	Regulators on second run producing high level of noise when operating. Non standard odouriser has no spare parts readily available with potential for not meeting regulatory requirements related to gas odourisation. Existing electrical and instrumentation installations do not comply with current standard. Not able to meet current and potential future customer demands in South Brisbane and Woolloongabba including new Children's Hospital, TAFE, Woolloongabba Central District Upgrade, Goodman Fielder, Chandler Aquatic Centre etc.	Severe	Possible	High	13	2	Upgrade existing Tingalpa Gate Station to minimise identified risks, improve integrity of supply for current customers and be able to meet estimated future customers maximum hourly demand of 20,000Sm3/h including establishment of additional class 300 outlet for future connection to DN100 Class 300 Cleveland Pipeline.	Low	5	800,000	2	In progress
6	Gate Station	Toowoomba	Existing odoriser is in poor condition and there is high risk that natural gas supplied to more than 14,000 customers in Toowoomba will not be sufficiently odorised and will not comply with regulatory requirements. There are and additional safety risks to public related to gas leaks that can not be detected by smell.	Severe	Possible	High	13	2	Replace existing odoriser.	Low	4	100,000	1	Planned for implementation in 2010/11
7	District Regulator Stations	All	Some underground district regulator stations are identified as confined spaces that are regularly field with water and represent safety risk for staff doing planned maintenance. District regulator failure can result in loss of supply to significant number of existing customers.	Moderate	Likely	High	12	2	Replace existing district regulator stations. Maintenance issues will be eliminated and likelihood of loss of supply will be minimised.	Low	5	320,000	1	Planned for implementation in 2010/11
8	High-pressure steel network	Southport, Surfers Paradise, Broadbeach	Existing high-pressure steel network supplying Surfers Paradise and Broadbeach has no capacity to support ongoing growth in customer demand for this area. Based on forecast pressure profiles existing network will not be able to meet required minimum supply pressures for Surfers Paradise and Broadbeach in winter 2013.	Moderate	Likely	High	12	2	Establish link between Southport and Surfers Paradise high-pressure distribution networks by constructing DN100 Class150 pipeline approximately 2.65km long and establish new district regulator station. Increase high-pressure networks available capacity and reliability of supply to be able to meet current and future customer demands.	Low	5	2,383,450	2	Planned for completion before winter 2013
9	Industrial and commercial metering stations	All	Older industrial and commercial meter installations require upgrades or replacements to comply with current standards or for continued safe operation. There is potential loss of supply to large customers, non-compliance with statutory, licence, regulations, with compulsory explanation to Regulator and potential adverse coverage in local media.	Moderate	Possible	Moderate	8	3	Upgrade existing I&C meter stations by installing 10 bypass regulators and replacing 10 diaphragm meters.	Low	2	151,000	1	Planned for implementation in 2010/11
10	Gate Station	Oakey	Metering is without flow computers with wiring not meeting technical requirements. Odoriser has no audit trail. Old regulators, that are not manufactured any more, require replacement.	Moderate	Possible	Moderate	8	3	Upgrade Oakey Gate Station including installation of new odoriser, new electrical and instrumentation installations and replacement of regulators.	Low	5	450,000	1	Planned for implementation in 2010/11
11	Gate Station	Ellen Grove	Station electrical and instrumentation installations do not meet technical requirements and represent safety risk for employees that operate and maintain this station.	Moderate	Possible	Moderate	8	3	Upgrade existing Ellen Grove Gate Station to meet electrical and instrumentation installation requirements	Low	2	150,000	1	Planned for implementation in 2010/11
12	Gate Station	Doboy	The odorisation unit is not reliable and requires high gas differential pressure with significant impact on available network capacity. Instrumentation needs to be upgraded to comply with current standard requirements. Inlet connection is in a pit constantly under water. There is potential for personal injury for employees and contractors using long narrow access road (especially after heavy rain).	Moderate	Possible	Moderate	8	3	After Caltex is disconnected and Tingalpa Gate Station upgraded, permanently open valve that is separating Doboy and Tingalpa networks. Cut off outlet connection to high-press steel network and remove aboveground installations from existing Doboy Gate Station site.	Low	2	150,000	1	Planned for implementation in 2010/11
13	High-pressure PE network	Surfers Paradise	Low level safety of supply to more than 200 existing commercial customers and limited spare capacity of existing high-pressure polyethylene network not sufficient to meet growth of customer demands.	Moderate	Possible	Moderate	8	3	Reinforcement of existing Surfers Paradise high-pressure PE network with new 90mm PE80 SDR11 main extensions 120m long. Increase high-pressure networks available capacity and reliability of supply to be able to meet current and future customer demands.	Low	5	61,000	1	Planned for implementation in 2010/11
14	High-pressure PE network	Broadbeach	Low level safety of supply to more than 100 commercial customers and limited spare capacity of existing high-pressure polyethylene network not sufficient to meet growth of customer demands.	Moderate	Possible	Moderate	8	3	Construct 63/90mm PE80 SDR11 network link 250m long that will increase supply reliability and available capacity of existing high pressure PE network necessary to improve response capability for emergencies and to meet current and future customers demands.	Low	5	63,100	1	Planned for implementation in 2010/11
15	District Regulator Stations	All	Some underground district regulator stations have no bypass regulator and are not able to supply gas to network when main run fails or require maintenance. Potential loss of supply to large number of customers.	Moderate	Possible	Moderate	8	3	Upgrade existing district regulator stations.	Low	5	71,000	1	Planned for implementation in 2010/11
16	Low, Medium and High-pressure PE Networks	All	Supply problems to significant number of tariff customers	Moderate	Possible	Moderate	8	3	Reinforce supply to existing distribution network	Low	2	50,000	Continuous	Average estimated cost per year
17	SCADA System	All	Not able to monitor continuously network flow rates and pressure levels at critical points that can result in loss of supply to large number of customers.	Moderate	Possible	Moderate	8	3	Establish telemetry on 12 fringe point monitors and 2 district regulator stations that will provide better control of distribution networks performance with alarms that will initiate necessary action to reduce likelihood for loss of supply to large number of customers.	Low	4	132,000	10	Planned to start with implementation in 2010/11
18	DN100 Class300 steel pipeline	Tingalpa to Cleveland	Pipeline currently operates only at 1,000kPa and has no sufficient spare capacity to meet potential future customer demands in Chandler, Redland Bay and other areas in vicinity of this pipeline.	Moderate	Possible	Moderate	8	3	Upgrade Cleveland Pipeline to be able to operate at class 300 pressures by extending 200m long section of new DN100 class 300 pipeline in Stanton Road, Tingalpa, to the Tingalpa Gate Station and increase operating pressure to approximately 2,000kPa if supported by increased customer demands.	Low	5	160,000	1	Planned for implementation in 2012/13

ASSET RISK MANAGEMENT PLAN - APT ALLGAS ENERGY PTY LTD DISTRIBUTION NETWORKS

No.	Risk Identification and Assessment								Risk Treatment Plan					
	Asset	Location	Risk Description	Highest Risk Consequence Rating	Highest Risk Likelihood Rating	Highest Risk Inherent Level	Highest Inherent Risk Score	Budget Priority	Risk Treatment	Highest Risk Level A/T	Highest Risk Score A/T	Total risk treatment cost ($Real 2010/11)	Number of years for risk treatment	Status
19	High - pressure steel network	Moorooka, Tarragindi, Salisbury, Coopers Plains, Rocklea	Part of existing high-pressure steel network is more than 45 years old with pipeline coating in poor condition, some block valves not operatable, unknown quality of welds etc. Based o previous risk assessment MAOP of this network is downgraded to 700kPa. There is potential loss of supply to more than 10,000 domestic and 20 major industrial customers further to potential failure of mains in this network.	Severe	Unlikely	Moderate	9	3	Construct new DN100 Class150 pipeline 1.2km long in Muriel Avenue, Moorooka, and establish new district regulator. This pipeline will link Ellen Grove 1 and Runcorn 1 high-pressure steel networks and improve supply reliability for existing customers.	Low	5	660,000	1	Not yet planned
20	Domestic meter sets	All	Potential failure of existing regulators resulting in customer installation overpressuresation with potential injury.	Moderate	Possible	Moderate	8	3	Consider to establish Domestic Regulator Change Programme to be completed at same time as Meter Change Programme	Low	2	114,000	Continuous	Not yet planned
21	110mm PE80 SDR11 high-pressure PE main	Sherwood Road, Rocklea	Single supply main with minimum spare capacity and potential for loss of supply to more than 3,000 customers..	Severe	Unlikely	Moderate	9	3	Establish second supply to Corinda by constructing 110mm PE80 SDR11 main extension 2.6km long with two new district regulator stations.	Low	2	650,000	1	Not yet planned
22	High - pressure steel network	Acacia Ridge	Large number of existing industrial customers in Acacia Ridge Industrial Estate has no back up supply. There is potential loss of supply to more than 20 industrial customers.	Severe	Unlikely	Moderate	9	3	Establish new district regulator station at Hellawell Road, Sunnybank Hills, as a backup supply to Runcorn 1 high-pressure steel network.	Low	5	80,000	1	Not yet planned
23	High-pressure steel services	Carole Park, Crestmead and Lytton	Some of existing industrial customers high-pressure steel services do not have service valve and can not be easily isolated in case of emergency on customer service or metering station.	Moderate	Possible	Moderate	8	3	Install missing service valves on high-pressure steel services supplying industrial customers.	Low	2	250,000	2	Not yet planned
24	110/160mm PE80 SDR11 mains	From Cobalt Street, Carole Park to Augusta Parkway, Brookwater	There is 10km long, single gas main supplying more than 1,500 domestic and 50 industrial and commercial customers, with high new customer connection rate. This main has no sufficient capacity to meet ongoing growth in customer demand and is exposed to potential third party damage and related loss of supply to more than 1,500 customers.	Moderate	Possible	Moderate	8	3	Construct new 250m long 110mm PE80 SDR17.6 main that will link existing Envestra's PE network in Bellbird Park with APA Group's PE network in Brookwater. This back up supply to APA Group's high-pressure polyethylene network with high new customer demand growth can provide between 200Sm3/h and 500Sm3/h at approximately 100kPa what will be sufficient to supply all domestic and most of commercial and industrial customers in Springfield.	Low	5	62,500	1	Not yet planned
25	DN200 High-Pressure Steel Main	From Tingalpa Gate Station to South Brisbane	Existing DN200 high-pressure steel main approximately 13km long is single supply main to more than 10,000 domestic customers and number of large industrial and commercial customers including Glassworks, Parmalat, PA and Mater Hospitals. It is more than 30 years old. There is potential loss of supply to more than 10,000 customers related to third party damage or main failure.	Severe	Unlikely	Moderate	9	3	Establish link between Tingalpa and Mt Gravatt high-pressure distribution networks by constructing DN100 Class150 pipeline 1.6km long. Consider to establish and additional link between Tingalpa and Runcorn 1 high-pressure distribution networks by constructing DN150 Class150 pipeline 3.5km long.	Low	5	960,000	1	Not yet planned
26	High - pressure steel network	Darra, Rocklea, Archerfield, Acacia Ridge, Coopers Plains, Willawong	Existing high-pressure steel networks with large number of existing mostly industrial customers has very limited spare capacity and back up supply to meet potential future customer demands. There is potential loss of supply to more than 40 large industrial customers.	Severe	Unlikely	Moderate	9	3	Construct 4.2km long DN150 class150 and 1.1km long DN100 class150 steel pipelines to interconnect Willawong, Ellen Grove and Runcorn high-pressure steel networks.	Low	5	2,520,000	2	Not yet planned

5.5 Distribution Facilities Life Cycle Plan

5.5.1 Overview

The distribution facilities comprise of pressure regulating installations, network isolation valves and cathodic protection (CP) facilities.

5.5.1.1 Pressure Regulating Installations

Various configuration designs are used within the APT Allgas network but typically they tend to be single stream active-monitor arrangements on small installations, and double stream active-monitor arrangements on the larger installations.

The following table summarises pressure regulating installation numbers and configuration.

Regulator Configuration	
Pressure Regime	**Number**
T-H	16
T-M	12
H-H	23
H-M	148
H-L	10
M-M	5
M-L	36
Total	**250**

5.5.1.2 Network Isolation Valves

Approximately 356 mainline and branch isolation valves are installed throughout the APT Allgas networks. These provide emergency isolation and control during normal operation, maintenance and emergency response situations. The following table summarises the various types of network isolation valves currently listed in the preventative maintenance program. Polyethylene valves are not included in the preventative maintenance schedule.

Item	Valve Category	Total
1	Mainline Isolation Block Valves	253
2	I&C Customer Supply - Primary Isolation	103
	Total	356

5.5.1.3 Cathodic Protection Facilities

A network corrosion protection system is used to protect in excess of 660km of steel mains and pipelines. This system is a sacrificial anode system that protects 100% of the Transmission Pressure and Local High Pressure Steel pipelines.

There are two types of material used in the sacrificial anode systems. There are in excess of 800 magnesium anodes with only a few zinc anodes. Anodes are replaced on an as-needs basis as identified from the Cathodic Protection Survey readings.

5.5.2 Asset Performance, Condition & Integrity

The inspections that have been carried out to date do not indicate that the condition of isolation valves located in underground vaults has deteriorated to the extent that a rehabilitation programme is required to ensure the life of these assets is maximised.

All pressure regulator stations in the APT Allgas Networks are being subjected to an upgrade program. Most existing APT Allgas pressure regulator installations were initially installed when conversion to Natural Gas was carried out in the late sixties and early seventies and the supply of gas to the suburbs was via high pressure pipelines. With all underground installations falling into an age group of '40 year plus' they are all under consideration for replacement.

Confined space entry issues have also been considered as an influencing factor in the replacement of in-ground regulator installations. Such installations only allow one person at a time to enter. Emergency recovery and heavy lifting then becomes an issue when carrying out maintenance and repairs.

5.5.3 Growth

Growth is governed by infrastructure changes and growth in demand from both residential and industrial development within financially viable distance of the existing networks.

5.5.4 Operation & Maintenance

5.5.4.1 Operation

A SCADA system is used to provide surveillance of Gate Station outlet network pressures with High/Low alarms paged out to standby resources for immediate action.

Allowances have been included in CAPEX projects for additional Network Surveillance capabilities. Projects have been proposed covering the extension of the SCADA system for improved network pressure surveillance and control of critical regulators and valves within the Queensland networks.

In addition, the system currently does not provide control functionality for remote operation of regulators and critical valves. This function would provide emergency response capabilities that currently exist in all other APA operated networks and is seen as an industry best practice benchmark.

5.5.4.2 *Pressure Regulator Installations Maintenance reference to policy*

Scheduled maintenance of pressure regulating installations (PRI's) is carried out in accordance with the requirements set out in the APA Transmission and Pipelines Manual Section on "Operations and Maintenance Schedule" for the frequency listing of all maintenance activities and the Section on "Scheduled Maintenance" which details what must be done for each activity.

A Pressure Control and Metering Procedures manual is currently in the final stages of completion and it is expected that this manual will be released in the early part of the 2010-11 financial year. The contents will be more specific to Networks pressure regulator and I&C regulator/metering installations and eventually supersede the Transmission and Pipelines manual in all but the gate station requirements.

The maintenance tasks and frequencies are derived from failure mode analysis of the relevant assets and past experience. Maintenance and breakdown records are maintained and provide feedback to the designers and maintenance policy setters. A preventative maintenance schedule and pressure control installation maintenance activities have been entered into the Preventative Maintenance Work programming computerised system (Maximo).

5.5.4.3 *Network Isolation Valves*

The maintenance of valve installations in the APT Allgas Networks comprises:

- Yearly inspection and maintenance of transmission valves, and
- Three yearly inspection and maintenance of other network valves.

5.5.4.4 *Cathodic Protection Systems O&M*

CP monitoring and inspection of CP units is carried out on a continuous basis in accordance with AS 2832.1 and AS 2885. The operational status of galvanic anodes is obtained by the use of current and potential measurements gathered on a continuous basis that effectively gives a six monthly survey for each anode and test point.

The monitoring of CP units commences after commissioning and, as there are few moving parts, maintenance is relatively minor. Small items, such as test box's and posts, are replaced from vehicle stocks during monitoring surveys. The main threats to the integrity of the CP systems are third party damages, contact with other structures (touches) and electrical surges.

The following aspects of the corrosion prevention systems are monitored and controlled:

- The CP effectiveness is measured using a 'close interval potential survey' during which the pipe-to-soil potential is measured using a saturated copper/copper sulphate reference electrode.
- The integrity of the polyethylene coating is measured using direct current voltage gradient (DCVG) surveys to assess the insulating integrity of the coating.

5.5.5 Repair/Replacement

Industry best practice expects that Pressure regulating Installations (PRI's) have the capability of lasting up to 40 years without the need for replacement provided:

- The PRI design remains suitable for current loads;
- The external surfaces of components are adequately painted to provide protection from corrosion, and
- The elements remain supported with spare parts availability.

Where replacement occurs, this would be due to changed capacity conditions of an installation arising from changes in supply pressure or a significant increase or decrease in output requirements.

Generally, PRI's are not replaced as complete units but are over-hauled (all major components and soft seals are replaced) every five years.

All pressure regulator stations in the APT Allgas Networks have been subject to an investigation to determine which installations should be included in an upgrade program. Currently there is a project underway replacing older installations due to confined space entry issues and water ingress from failure of the pit lid seals and deterioration of the block wall construction that has occurred over time. This project is currently in the FY 10/11 budget with allowances made in the CAPEX budget for any that are expected to be identified during the following 5 years.

It is planned to undertake a remediation of critical isolation valves located in underground valve pits as they are identified through the newly installed inspection schedule which has been established to compensate for the poor maintenance performance over previous years.

5.5.6 Risks Issues/Actions

The main risks associated with these facilities are failure or breakdown of the regulation equipment and failure of or inability to operate valves.

Failure of the pressure regulation equipment can lead to:

Over pressurisation – Pressures exceeding the maximum allowable operating pressure of the network could result in more gas leaks and possibly rupture of mains or failure of other components creating a hazardous situation to both the public and APA personnel.

Loss of supply - Loss of supply results in costly process to restore gas to consumers and also the risks of expensive claims for losses incurred by consumers.

The design (active monitor system) of these facilities and the maintenance schedule are in place to mitigate these risks to acceptable levels.

The Key Risks/Issues have been summarised in the following Table.

Item	Risk/Issue	Risk/Issue Detail	Current Controls	Risk Rating	Additional Control Options	Proj Ref No.
1	Corrosion & water Ingress associate with below ground bricked "valve vaults	Various investigations and inspections have highlighted significant corrosion activity of critical isolation valves located in underground valve pits that if left unchecked, could cause a significant risk to the safe and reliable supply of gas.	Monitoring and maintenance as necessary	Low	None	
2	Leak at installation	Gas leak may cause fire/explosion/engulfment or public or employee, may cause feeling of unwell for public, public perception of the safety of gas reduced	Odorant in gas, Leak Survey, periodic maintenance on sites.	Mod	None	
3	Regulator Failure over pressure	Regulator fails and over pressurises the network causing Domestic regulators to fail and leaks to occur on valves, fittings and pipes	Telemeters downstream and at the regulators, standby personnel able to respond, domestic regulators designed to withstand 1050 KPA, all domestic fitted with safety relief valves to prevent downstream overpressure	Low	Increase number of telemeter sites at regulators, install remote operation on regulators	
4	Regulator Failure low pressure or loss of supply	Regulator fails closed causing loss of supply to hundreds of customers	Telemeters downstream and at the regulators, standby personnel able to respond. Procedures for turn off and restore supply, trained personnel in these procedures	Low	Increase the number of telemeters and alarms	
5	Slam shut Failure to operate	Slam shut valve is the overpressure safety valve if this fails to operate in an overpressure situation Transmission pressure may enter the network	Telemeters downstream and at the regulator sites, standby personnel, Periodical maintenance to test slam shuts operability	Low	Increase the number of telemeters and alarms	
6	Pilot Failure	Overpressure, due to no or high lock up	Active/ monitor set up on each regulator with Slam shut valve as final safety feature	Low	Increase the number of telemeters and alarms	
7	Isolation Valve not operable	Valve not able to be operated in an emergency allowing high pressure to continue or for an escape to continue creating risk of fire/explosion or injury to the public or employee	All isolation valves checked for accessibility and operability at PM check	Low	None	
8	Regulator capacity low	Causes high regulator droop and slow recovery causing low pressure and customer complaints as well as safety concerns for appliances where pilot lights go out and the flame failure safety device does not operate.	Telemetry/ pressure recorders to indicate problem areas Redundancy regulators included in network to assist with high demand periods, planning review capacity and loads during peak times through pressure surveys.	Low	None	
9	Filter choke	Low pressure, damage regulator parts, damage to reputation.	Periodic filter checks, telemetry monitoring, Network analysis to determine flows and balance gas flows to prevent excessive dust and hydrocarbon pick up in the mains	Low	None	
10	Confined space entry	Asphyxiated by gas, slips trips and falls	Trained personnel, vaults and structures maintained and clean, gas detectors appropriate for use, SCBA available with rescue equipment. Audits on personnel, retraining every year. Lock out tag out procedure	Mod	More auditing of hazardous task permits auditing of lockout tag out procedure	
11	Insects/ Vermin in Regulator vaults	Employees bitten by insects, snakes	Mesh over vents, rubbish cleared, procedures	Mod	None	
12	Water in Regulator Vault	Employee slips or drowns in water if unconscious	Pumps and equipment to remove water, procedures	low	Replace Lids and/or seals on the lids to prevent ingress of water	
13	Above Ground regulators	Vandalism, vehicles hitting	Sturdy Kiosks and post to prevent damage, Periodic visits and maintenance to reduce vandalism, signs and phone numbers in obvious position for the public to report damage to assets	Low	Locate and plan installations to be more aesthetically pleasing	
14	High noise issues affecting public	Public complaint, damage reputation	Kiosks insulate noise, design of regulators reduces the noise	Low	When the public complain we will respond to that location and analyse the best solution to reduce noise	
15	High noise issues affecting employees	Damage to employees hearing, work cover complaint and cost penalty	Ear muffs and procedures	Low	Ensure employees have the correct rated earmuffs, carryout audits to ensure they wear appropriate hearing protection	
16	Manual Handling issues during overhauls	Heavy equipment to be lifted, lifting equipment fails, Employee is hurt, equipment is damaged, valves seized	Training, reducing equipment to be lifted, repair difficult to open and close valves.	Mod	Reduce the need to lift heavy equipment out of regulator vaults	
17	Loss of competent Technically trained staff	Cannot maintain equipment which will result in failures	Constant retraining of new Technicians, maintaining a Training department with appropriate training skills, procedures,	High	Set up a program to have a training schedule and system to rotate personnel through Network Maintenance and ensure all staff are adequately trained and up to date on the latest equipment	

5.6 Metering Facilities Life Cycle Plan

5.6.1 Overview

Consumer metering ranges from a simple meter-regulator installation for domestic and small I&C installations to more complex assemblies with filters, bypass valves, correcting instruments and telemetry. As part of the Queensland contestability rules all metering installations at sites consuming >100TJ are required to have data logging and telemetry facilities installed. All sites using more than 10 TJ Per Annum which have churned from the original retailer or are Greenfield consumers also need to have telemetry installed at the meter installation. Currently all such installations comply with this requirement.

At the end of the 2008-09 year the breakdown of active consumers in APT Allgas Networks is as follows:

Location	< 1 TJ/yr		1 -10 TJ/yr	11 -100 TJ/yr	>100 TJ /yr	Total
	Residential	I&C	I&C	I&C	I&C	
Brisbane and South Coast	60,986	2,719	481	69	21	64,276
Northern New South Wales	1,149	40	10	1	0	1,200
Toowoomba	14,392	490	71	7	3	14,963
Oakey	305	11	4	2	1	323
Moura	0	0	0	0	1	1
Total	76,832	3,260	566	79	26	80,763

Management of meters is governed by the Queensland Gas Act, Regulations and Distribution License requirements, as defined in the Queensland Networks Meter Measurement Scheme - Release 6 for the APT Allgas networks. This Plan was developed by APA and is audited by the Queensland Department of Mines and Energy.

Metering pressures range therefore from 1.25 or 2.75 kPa for domestic installations and up to 200 kPa for I&C consumers.

Details of meter families including type of meter volumes and age profiles are given in the Queensland Networks Meter Measurement Scheme - Release 6.

There are predominantly 3 main types of meters used:

1. Diaphragm meters – used on domestic consumer and smaller I&C consumer installations;
2. Rotary meters - used in medium to large I&C consumer installations, and
3. Turbine meters - used in the very large consumer installations.

Details including, numbers and age are available in the Queensland Networks Meter Measurement Scheme - Release 6.

To validate the supplier's accuracy test results for all new meters, a 5% random sampling of each delivery is carried out to ensure nothing has happened in transit to affect the accuracy.

5.6.2 Asset Performance, Condition & Integrity

The following Table provides a summary of meter related leaks.

The majority of these repairs were undertaken by the first response fitter either tightening a joint or replacing the meter/service regulator.

For Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Total Meter Leaks	1197	1102	661	770	1,037	1,052

5.6.3 Growth

	Actual					Forecast					
	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16
Domestic Growth	2263	2749	3364	3174	2700	3466	3592	3725	3876	4015	4164
I&C Growth	245	297	144	129	133	192	192	192	192	192	192

5.6.4 Operation & Maintenance

The maintenance frequency of metering installations depends on the type of equipment at the site and the operating pressure of the installation and can be summarised as follows:

5.6.4.1 Low Pressure Installations

These sites all have smaller diaphragm meters and no routine maintenance is carried out unless the consumer, retailer or APT O&M personnel report a problem.

5.6.4.2 Elevated Pressure Installations with Remote Telemetry and Correcting Instruments

The sites are visited on a 6 monthly basis to:

- check the pressure and temperature transducers for accuracy;
- compare the uncorrected flow on the meter index with the uncorrected flow from the correcting instrument, and
- check the isolation valve, check meter site for leaks and ensure that all signage is appropriate

Note that sites are visited 3 monthly where the meter requires oil top up or where a mechanical drive arms exist.

5.6.5 Renewal/Upgrade/Disposal

5.6.5.1 Meter Removal/Replacement

Modern meters are changed under the extended performance using Australian Standard *AS/NZS 4944: 2006 – Gas Meters In Service Compliance Testing*.

Meter replacement is governed by the following criteria detailed in the Queensland Networks Meter Measurement Scheme - Release 6.

5.6.5.2 Extended Field Life Program – Meters < 25m3/hr

All meters with a capacity less than 25 m3/hr are on a field life extension program. Once meters in these meter groups fail they are removed, repaired or refurbished, tested, calibrated and returned to the field.

5.6.5.3 Fixed 10 year Term - Meters > 25m3/hr

All meters with a capacity greater than 25 m3/hr are installed with a fixed 10 year life. After this period they are repaired or refurbished, tested, calibrated and then returned to the field.

Meters that do not satisfy accuracy requirements are disposed of.

Each year APT Allgas requires APA to undertake a meter change-over program to replace meters that have reached their approved life span. All meters are deemed to have a 10 year life unless otherwise approved by the technical regulator. The families of meters that have been approved different life spans are listed in the Queensland Networks Meter Measurement Scheme - Release 6 for APT Allgas networks.

Meters returned from the field are tested, repaired and tested for re-use or disposed of and scrapped if the meter is uneconomic to repair or parts are no longer available.

Meters that are disposed of are replaced with new meters.

All diaphragm meters that have the fixed 10 year term are not repaired but are condemned and scrapped when returned from the field after their 10 years life expires.

A meter aging report derived from the Maximo WMS is used to monitor and forecast meter life and change out requirements.

The following Table summarises the historic and forecast meter changes.

	Actual					Forecast					
	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
PMC – Tariff V - Domestic	489	3011	1585	1179	1574	2,000	3,000	2,200	6,000	11,000	4,500
PMC – I&C	177	7	26	123	166	192	221	167	162	226	312

Meters returned from the field that cannot be repaired either because the condition of the meter is beyond repair, or parts are no longer available or it is uneconomic to repair are disposed of for scrap. These meters are replaced with new meters.

In 2009/10 there were 407 meters disposals.

5.6.6 Risks/Issues/Actions

Item	Risk/Issue	Risk/Issue Detail	Current Controls	Risk Rating	Additional Control Options	Proj Ref No.
1	Meter failure	Meter stops recording gas flow resulting in loss of revenue and increased UAFG	Replacement of faulty meters Maintenance of rotary and turbine meters Automatic flow checks in billing software Meter reading feedback	mod	Domestic meters protected from elements by housing in meter boxes or covers	
2	Regulator failure	Regulator fails or is inaccurate resulting in wrong correction factors for billing	Replacement/resetting of faulty equipment. Routine maintenance checks at elevated pressure sites	mod		
3	Damage to metering equipment	Physical damage to meter and/or other equipment	Location of meter in safe position. Protection provided where necessary	mod	Consumers required to provide adequate protection	
4	Meters left in field beyond accepted meter life because they are not accessible	Non compliance with regulations	Procedure to contact consumers to arrange access to site.	mod	Place responsibility on retailer to provide access	
5	Meters at I&C consumers may be oversized. Reason is that meter had been sized correctly initially but flow requirement has changed over the years	Meter operating at low end of its range and therefore may be inaccurate. Cost of meter greater than it needs to be	Relace as and when identified	low		
6	Significant drop in meter change numbers for 2011/12 and 2012/13	Reduction in labour resource requirements for meter changes and meter repairs	Reallocation of work	Low		
7	I&C Meter set corrosion	Corrosion of pipework and valves at some I&C sites causing risk of gas leak and safety hazard	Maintenance carried out during scheduled maintenance activities	mod	Replace installation once it deteriorates beyond the scope of scheduled maintenance activities	
8	Regulation Differences Between States	Regulations between Australian states are not consistent. The approved meter life is 10 years compared to 15 in Victoria. Also approved field life extension process is different from that in Victoria or SA.	Separate Gas Measurement Plans covering Envestra's networks in SA, Qld & Vic	Low	Develop National processes across the networks operated and managed by APA.	

5.7 Network Control & Monitoring Life Cycle Plan

5.7.1 Overview

The SCADA system is used to monitor gas flows, pressures, temperatures at all the APT Allgas Gate and Sub-Gate Stations as well as various other alarms.

Network pressures are monitored at various locations within the networks with data communicated back to a central base station by radio or through the telephone network.

5.7.2 Asset Performance, Condition & Integrity

Operational Risk Management KPI's indicate that 100% availability has been maintained within the SCADA system for both consumer metering and pressure surveillance.

5.7.3 Growth

All FRC site have been installed new progressively since 2003 as a requirement of full retail contestability market rules. To date all sites are now monitored and reported upon on a daily basis as required by legislation.

APA Group E & I technicians were appointed in Queensland approximately two years ago and in addition to meter installation work have concentrated on the electrical upgrade of installations within Hazardous Areas to meet legislative requirements.

Although maintenance work has been carried out as and when required during those two years, analysis is continuing to determine proposals on future expectations.

Industrial and Commercial meter monitoring installations are linked directly to customer demands. Pressure regulation monitoring and control will continue to be upgraded and improved as the network grows and resources allow.

5.7.4 Operation & Maintenance

The maintenance schedule comprises an annual visit to each site to:

- test and calibrate all instrument, pressure, temperature transmitters and verify flow computer calculations;
- test batteries conditions and earthing systems;
- clean solar systems and verify functionality, and
- inspect hazardous installation.

5.7.5 Replacement

Generally, SCADA facilities are replaced as result of technical obsolescence. The facilities have a technical life of about 10 years. Over the last 5 years the move to standard communication protocols (GSM/GPRS) has driven changes to field devices using telecommunications.

Typically telemetry and SCADA equipment is accepted as having a 10 year life. Older equipment is being replaced wherever possible however in the case of instrumentation under the expected 10 year life span breakdown maintenance numbers will continue to be monitored so that it can be determined when it is economically viable to replace/upgrade rather than continue to repair.

5.7.6 Risks/Issues/Actions

Item	Risk/Issue	Risk/Issue Detail	Current Controls	Risk Rating	Additional Control Options	Proj Ref No.
1	Having 240 volts at the telemeter	Employee or a member of the public may be electrocuted,	Installed by licensed and experienced persons installed to Australian standards, periodic maintenance performed. PPE worn, equipment isolated from 240 volts when working on equipment. Unless fault finding	Low	Ensure all E & I employees have insulated PPE such as boots, clothing, gloves and a insulated mat to stand on when working on live panels	
2	Risk of falling from heights during installation or fault rectification	Employee injured when they fall off a ladder.	Employee ties ladder to pole before climbing, risk assessment and procedures, employees trained.	Low	Use Scaffolding when appropriate	
3	Manual handling	Heavy panels to be lifted and installed, required to reach and stretch, only one person can access the panel. Heavy batteries to be lifted, Excavating for cables and conduits. General working with tools	Training and experience, procedures, spotters, use two people where appropriate, minimise distance to lift and use apparatus to assist.	Moderate	None	
4	Slips trips and falls	Location of telemeters and surfaces which are in the general public area or on customer sites	PPE and experienced personnel who carry out pre start checklist and hot work permits are issued on certain jobs.	Low	None	
5	Location in regards to power lines	Panel too close to power lines and risking possible electrocution or damage to equipment	Planning and following local electricity network operator guidelines for structures close to poles and wires	Low	None	
6	Damage by vehicles/vandalism	Telemeter equipment damaged or stolen resulting in no information sent or collected by telemeter, customer not able to access information, pressure in network not able to be accessed.	Location of telemeter boxes, fencing gates, locked boxes	Low	None	
7	Telemeter located within the Hazardous area zone of gas and electrical equipment	Installed electrical equipment could be faulty and result in a spark at same time as there is a gas escape resulting in fire explosion or employee/public injury or death.	The equipment installed in the hazardous zone complies with the AS for hazardous installations, the equipment must experience two different faults before there is a breach of electrical discharge as per Exia standards. All equipment installed by experienced personnel	Low	None	
8	Telemeter fails pressure site	No information for pressure is sent back and in the event that there is an alarm no action will be taken which may result in over pressure or loss of gas supply to customers	Checks are carried out each morning on weekdays to ensure all Telemetry is communicating and any sites not communicating are visited to confirm status	Moderate	None	
9	Telemeter fails customer site	No information is recorded for the customers meter details, the customer receives an estimated value and if the failure continues APA may be issued a fine.	The BA analyse the customer site data each week day covering weekends and they report errors for E & I Technicians to visit the site. If the comms fails each site is able to store meter information for 30 days and when the problem is rectified this information will be updated.	Moderate	None	
10	Communication fails	No information received	The BA analyse the customer site data each week day covering weekends and they report errors for E & I Technicians to visit the site. If the comms fails each site is able to store meter information for 30 days and when the problem is rectified this information will be updated.	Low	None	
11	Working in outdoors/country areas	Employees bitten by insects, Ants, snakes sunburn	All telemeters are sealed although if the insects manage to enter and build a nest the technicians have PPE, spray and ant dust to destroy and remove the insects.	Low	None	
12	Working in the general public area	Theft and angry customers, dog attacks on employees	Training on how to behave and respond to customers	Low	updated training on how to behave when with animals and how to behave and respond to customers	
13	Danger to employee from pressure release of gas	Injury to employee or fire/explosion/engulfment.	Odorant in gas, Leak Survey, periodic maintenance on sites. PPE worn by employee	Moderate	None	
14	Telemeters located on customer sites	Problems with access and possible for the employee to be injured, reliant on the customers power source which can be switched off due to fault on customer site or non payment of bill	Good communication with customer, induction to sites, customer is aware of requirements.	Low	None	

SECTION 6 - CAPEX & OPEX PLANS

6.1.1 Capital Expenditure Plan

PLANNED CAPITAL EXPENDITURE WITH RATES ESCALATION AND CPI - APT ALLGAS ENERGY PTY LTD NETWORKS (Nominal)						
No. Description	**10/11 Total**	**11/12 Total**	**12/13 Total**	**13/14 Total**	**14/15 Total**	**15/16 Total**
TOTAL	**24,912,430**	**25,701,094**	**25,716,908**	**28,157,991**	**28,844,730**	**29,985,721**
TOTAL GROWTH	**13,551,011**	**15,101,656**	**16,221,137**	**17,101,952**	**18,322,692**	**19,571,847**
TOTAL STAY IN BUSINESS	**10,437,448**	**7,396,001**	**7,436,382**	**9,583,032**	**9,842,613**	**9,882,778**
TOTAL NON SYSTEMS	**923,970**	**3,203,438**	**2,059,389**	**1,473,006**	**679,425**	**531,095**
1 Growth - Domestic	**9,775,464**	**11,276,580**	**12,108,979**	**12,766,741**	**13,680,403**	**14,623,510**
2 New Domestic Meter Set	761,056	879,890	944,087	994,558	1,064,832	1,137,510
3 New Domestic Service - Estate	3,346,570	3,934,337	4,196,448	4,393,930	4,674,472	4,969,298
4 New Domestic Service - Existing Domestic	1,904,994	2,060,270	2,264,951	2,444,599	2,682,563	2,918,452
5 New Main - Estate	2,359,111	2,773,448	2,958,219	3,097,430	3,295,193	3,503,027
6 New Main - Existing Domestic	1,403,733	1,628,635	1,745,274	1,836,223	1,963,343	2,095,223
8 Growth - Commercial and Industrial	**3,775,547**	**3,825,076**	**4,112,157**	**4,335,212**	**4,642,290**	**4,948,338**
9 Industrial and Commercial Meter Station < 10TJ/Annum	1,258,516	1,229,971	1,323,534	1,396,578	1,496,778	1,596,999
10 Industrial and Commercial Meter Station > 10TJ/Annum		62,382	65,333	67,143	70,134	72,618
11 New Industrial and Commercial Service < 10TJ/Annum	1,161,707	1,135,358	1,221,724	1,289,149	1,381,641	1,474,153
12 New Industrial and Commercial Service > 10TJ/Annum		10,397	10,889	11,191	11,689	12,103
13 New Main - Industrial and Commercial <10TJ/annum	1,355,325	1,324,585	1,425,345	1,504,007	1,611,914	1,719,845
14 New Main - Industrial and Commercial >10TJ/annum		62,382	65,333	67,143	70,134	72,618
18 Stay in Business/Growth - Augmentation	**807,245**	**1,606,761**	**1,557,154**	**3,189,301**	**2,527,164**	**2,771,602**
19 Tingalpa Gate Station Upgrade - Increase capacity; additional Class 300 outlet	363,033	332,706				
20 Ellen Grove Gate Station Upgrade - DN150 Cl.300 inlet; odouriser; E&I	151,264					
21 Broadbeach Augmentation Project, 63/90mm PE80 SDR11, 250m long	63,027					
22 Surfers Paradise/Broadbeach HP Steel Augmentation Project, 100NB Class 150, 3.6km long		1,222,070	1,315,422			
23 Minor Network Augmentation	50,421	51,985	54,444	55,953	58,445	60,515
24 Telemetry - Fringe point monitors	24,202		13,067		14,027	
25 Telemetry - District regulator stations	60,506					
26 PE Network reinforcement, Medway Street, Rocklea, 63mm PE, 80m long	34,286					
27 Surfers Paradise PE Network Augmentation Project, 90mm PE80 SDR11, 120m long	60,506					
28 Upgrade of Cleveland Pipeline to Class 300, 100NB Class 300 0.2km long			174,221			
29 South Coast Pipeline Stage 2, 200NB Class 600, 10.2km long				3,133,349	2,454,692	2,711,086
43 Stay in Business - Renewal	**9,630,203**	**5,789,240**	**5,879,228**	**6,393,730**	**7,315,449**	**7,111,177**
44 Meter Change - Meters Domestic	423,539	428,379	385,529	759,289	1,276,440	644,561
45 Meter Change - Meters Industrial and Commercial < 10 TJ/Annum	372,654	471,728	373,324	372,181	542,344	775,245
46 Meter Change - Meters Industrial and Commercial > 10TJ/Annum	60,506					
47 Mains Renewal - Block	7,131,299	4,002,865	4,192,190	4,308,355	4,500,268	4,659,679
48 Mains Renewal - Piece	141,180	145,559	152,443	156,667	163,646	169,443
49 Service Renewal	235,633	220,856	231,302	237,712	248,300	257,096
50 Replace existing district regulator stations	322,696					
51 Upgrade existing district regulator stations	70,590					
52 Industrial and Commercial Meter Station Upgrades	151,264					
53 Oakey Gate Station - Upgrade of station including odouriser and E&I installations	453,792					
54 Doboy Gate Station Removal	151,264					
55 Replace existing odouriser - Toowoomba Gate Station	100,843					
56 Domestic Regulators Change Program	14,945					
57 Facilities upgrades and replacements		519,853	544,440	559,527	584,450	605,153
73 Non System Capital Expenditure	**923,970**	**3,203,438**	**2,059,389**	**1,473,006**	**679,425**	**531,095**
74 Miscellaneous Items - Non System	126,053	271,623	284,470	292,353	305,375	316,193
75 Warehouse Racking - Mansfield (Mark Beddows)	75,632					
76 Warehouse Racking - Toowoomba (Mark Beddows)	12,605					
77 2 Compressors - Mansfield (Mark Beddows)	75,632					
78 Truck (Mark Beddows)	176,475					
79 Bar Code Equipment (Mark Beddows)	8,824					
80 Kitchen replacement - Mansfield (Mark Beddows)	32,774					
81 Optical Methane Gas Detector (Peter Lather)	50,421					
82 Replace existing stopple equipment over 4 years period	88,237	90,974	95,277	97,917		
83 Transmission pipeline emergency repair clamps for uncontrolled gas escape repair	12,605					
84 Emergency stopple fittings	264,712					
85 IT Systems - Knowledge Management		617,325				
86 IT Systems - Upgrades and renewals		12,998	122,511	240,580	14,613	15,130
87 IT Systems - Road Map Initiatives		1,916,775	1,448,289	419,760		
88 IT Applications - FRC related upgrades		39,010	40,855	279,674	43,857	45,411
89 IT Systems - SCADA related upgrades		254,733	67,987	142,723	315,580	154,361

6.1.2 Scope Change OPEX Projects

Ref No	Alias	Activity/ Project Driver	Activity/Project Description	Risk Rating	Risk Score Untreated	Risk Score Treated	Cost/Risk Reduction	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16
			Non system Capex										
			Lightweight lid replacement program on Cocon district regulator stations										
			Commercial QLD Gas Market Administration										
			Queensland Networks Roadmap Initiative (IT)										
			Network Development initiative to facilitate development & deployment of new technology into Qld Marketplace										

6.1.3 SIB OPEX Projects

Ref No	Alias	Activity/ Project Driver	Activity/Project Description	Risk Rating	Risk Score Untreated	Risk Score Treated	Cost/Risk Reduction	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16
			Periodic maintenance required for pipeline bridge crossings										
			Employ additional Revenue Protection Officer to Monitor UAG										
			Explain step increase in UAG Costs										
			Implement periodical condition monitoring of cased pipelines										
			Upgrade/ renew IT infrastructure										
			Implementation of management information systems										
			Extension of Leakage Survey program to include services in medium pressure and low pressure districts.										
			Qld Networks IT Applications										

SECTION 7 - PROJECT PROPOSALS

Business Case Documents to be embedded into File Reference column for each project.