APT Allgas Energy Pty Limited

Business Cases

Effective
01 July 2011 – 30 June 2016

Business Cases

Upgrade Tingalpa Gate Station
Augmentation of existing high-pressure steel network supply gas to Surfers Paradise and Broadbeach
South Coast Supply Project Stage 2
Periodic Meter change Program
IT Infrastructure Upgrades
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SCADA Upgrade
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Cocon Lid Replacement
Extension of Leakage Survey Program
Unaccounted for Gas
Condition Monitoring of Cased Pipelines
Maintenance of Bridge Crossings by Steel Pipelines
Additional Revenue Protection Officer
Deployment of New Technology
Market Rule Changes

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APA Group

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Australian Pipeline Ltd
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Australian Pipeline Trust
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APT Investment Trust
ARSN 115 585 441

Business Case

Asset Owner:	**APT Allgas Energy Pty Limited**
Asset:	**Queensland Natural Gas Distribution Network**
Project:	**TINGALPA GATE STATION UPGRADE**
Submitted to:	
Prepared by:	**Stevan Gajinov, Strategic Planning Engineer**
Date:	**8th August 2010**

PURPOSE

This business case supports the proposed Capital Expenditure Forecast, which forms part of the 2011 Access Arrangement Submission for APT Allgas Energy Pty Ltd.

BACKGROUND

Tingalpa Gate Station is connected to the Roma to Brisbane Pipeline – Metro section through DN50 class 300 off-take valve. Gas velocity through this valve is extremely high, at peak times more than 55m/s. Functionality of this valve has never been checked and there is a major concern that this valve may not be operable and will fail to isolate RBP in case of any failure of the connection pipe between RBP and Tingalpa Gate Station. The potential for an increase of flow-rate through the Tingalpa Gate Station, means velocity through this off-take valve will increase above 100m/s.

Supply pressure is between 3,000kPa and 4,000kPa and is cut to 990kPa through two monitor/active Gorter regulators DN50 Class 150. The stand-by regulator run has two Fisher regulators DN50 class 300. The critical issue is that main run Gorter silencers clog-up with sulphur, at regular intervals of approximately 2 months, resulting in sharp outlet pressure drop and transfer of flow through second run with noisy Fisher regulators. Multiple complaints have been received from neighbouring townhouses. Surveys confirmed that actual noise is much higher than allowable limits. To minimise the noise issues cleaning of silencers is scheduled at 2 monthly intervals.

At the inlet to each regulator run there are 500 microns cartridge filters. These filters fall short of the standard 10 microns cartridges used on similar sites. The installed filters are not able to protect other equipment from fine dust in the gas stream.

There are two metering runs with Equimeter T-57 turbine meters DN150 class 150 with a maximum capacity of 1,400m3/h. The current meter runs configuration does not allow on-line validations.

The installed Tartarini odouriser is of a specific design which is different to odourisers in other locations in Queensland. There are no spare parts available in Australia for this odouriser configuration. There have been instances where regulators on the odourisers have failed and as a result of that it was not possible to odourise gas at this station while waiting for delivery of replacement regulators.

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This station also has some old plug valves that cannot be operated.

The electrical installation needs a major upgrade to comply with the electrical codes. There are some transmitters at this site that are in excess of 15 years old and routinely fail. The wiring from these transmitters to the RTU is in urgent need of replacement. In addition the RTU needs an upgrade in order for this site to be compliant with standards. The barriers are not fully compliant.

The current earthing system does not comply with code. Recent lightning strikes to the station have damaged a flow computer and the associated transmitters. Tests indicate that the earthing is not complaint and significant work is required to install sufficient earthing at this site.

Tingalpa Gate Station high-pressure steel network has a 15km long DN100 steel pipeline supplying Cleveland. This pipeline has an MAOP of 5,000kPa. This pipeline is not directly connected to gate station, but requires an extension of approximately 200m to connect directly to Tingalpa Gate Station.

The Tingalpa Gate Station high-pressure network is also connected to Doboy Gate Station high-pressure steel network. The separation block valve is usually closed due to current capacity limitations at both gate stations. This link is used from time to time when alternative network operation is required to perform mains relocation work or to respond to emergencies. To do so requires monitoring of flow-rates at both stations. Maximum hourly load for Doboy Gate Station is 4,600Sm3/h with a plan for this to be reduced to approximately 2,500Sm3/h after disconnection of Caltex in the second half of 2010.

Tingalpa Gate Station currently supplies 20,000 domestic and 1,700 commercial and industrial customers with a total connected load of approximately 114,000Sm3/h, and an actual peak load of 10,900Sm3/h in winter 2009 with average diversity factor of 0.10 (0.28 for C&I and 0.01 for domestics).

Based on current load forecasts there is potentially additional hourly demands at this station as follows:

- [Information Confidential]
- [Information Confidential]
- [Information Confidential]
- [Information Confidential]
- [Information Confidential]
- [Information Confidential]
- [Information Confidential]

Further, there is the possibility to supply all Doboy Gate Station high-pressure network through the Tingalpa gate station post Caltex's disconnection from the network whereby it will be supplied directly from the transmission pipeline.

Peak winter day load profiles for last 5 years are shown on chart below.

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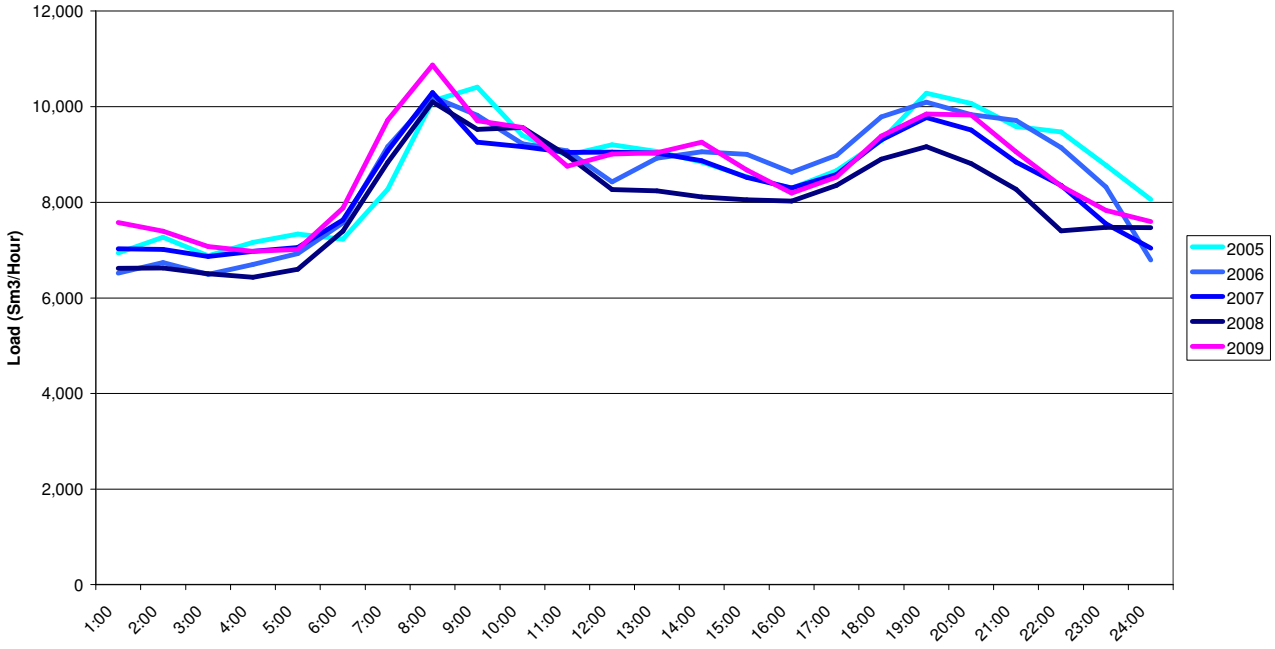
PEAK DAY LOAD PROFILE - TINGALPA



IDENTIFICATION OF NEED

An assessment based on current performance of Tingalpa Gate Station and the forecast additional requirements the critical items identified are:

- Integrity of services requires upgrade of gas filtration and improved operation of all critical station valves;
- Compliance with environmental standards requires reduction in station noise to acceptable level at all times;
- Provision of reliable gas odorisation at all times;
- Improve station electrical installations and earthing;
- Capacity to meet existing customers demand and projected demand of existing and potential customers;
- Integrity of services by maintaining back up or establishing permanent supply to customers connected to Doboy Gate Station high-pressure steel network;
- Discussions re integrity of supply to Tingalpa Gate Station are to be held with transmission pipeline operator.

RISK ASSESSMENT

There are number of risks identified on Tingalpa Gate Station that require urgent action.

- The station electrical installations and earthing do not meet technical requirements and represent safety risk for employees that operate and maintain this station and for the equipment;

- Sporadic high noise levels do not meet environmental requirements and represent safety risk for public (neighbouring townhouses);

- There is a risk of potential damage or failure of expensive equipment and related supply problems for large number of customers as a result of poor gas filtration;

- A major risk is potential loss of supply to 20,000 domestic and 1,700 commercial and industrial customers with potential high level of compensation claims. In addition business reputation and customer's perception of natural gas being a safe and reliable source of energy would be affected;

- Failure to enhance capacity will result in foregoing revenue from potential new customers who will not be able to be supplied from existing the network.

Attached Risk Mitigation Form showing current risk assessment and estimated risk levels for all alternative risk mitigation options.

EVALUATION OF ALTERNATIVES

Option 1

Construct new gate station at same location to meet the following requirements:

- Minimum station design capacity of MHQ=20,000Sm3/h;
- Connection for potential new station inlet MAOP=5,000kPa for MHQ=20,000Sm3/h at 2,000kPa;
- One station outlet with MAOP=1,050kPa for MHQ=20,000Sm3/h at 1,000kPa;
- One station outlet with MAOP=5,000kPa for MHQ=5,000Sm3/h at 2,000kPa;
- New filtration, pressure reduction, metering, odorisation, instrumentation, electrical installations and earthing to meet current industry standards.

In addition, concerns related to integrity of supply to Tingalpa Gate Station would be discussed with the transmission pipeline operator.

This option is addressing all identified needs and related risks.

Option 2

Upgrade existing gate station with critical elements as follows:

- Replace existing filters (cartridges of 10 microns or better);
- Replace Fisher regulators with two new regulators (monitor/active) that will produce acceptable level of noise similar to the existing Gorter regulators
- Replace existing odourisation unit with standard model used on other similar sites that will have back up and spare parts in case of failure;
- Replace critical faulty station valves;
- Upgrade existing electrical installation and station earthing to meet required industry standard.

In addition. concerns related to integrity of supply to Tingalpa Gate Station would be discussed with the transmission pipeline operator.

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This option addresses identified public and operational safety needs and related risks including integrity of supply to existing customers.

However, with a maximum station capacity of approximately MHQ=14,000Sm3/h, the station will only be able to meet a very limited increase in customer demand. The station would not able to provide outlet pressure higher than 1,050kPa in the Cleveland Pipeline and will require major upgrade to meet potential future demands in this area. It is very likely that station will not have sufficient spare capacity to permanently supply Doboy Gate Station high-pressure steel network (after Caltex is disconnected in second half of 2010).

Option 3

Upgrade existing gate station with critical elements as follows:

- Purchase an additional odourisation unit (same as existing) and all critical supporting equipment and parts and keep them in store as replacement for failures;
- Upgrade existing electrical installations and station earthing to meet required industry standard;
- Continue to perform scheduled cleaning of silencers on Gorter regulators.

In addition, concerns related to the integrity of supply to Tingalpa Gate Station would be discussed with the transmission pipeline operator.

This option addresses to a lesser extent public and operational safety needs and related risks including integrity of supply to existing customers.

Further, with a maximum station capacity of approximately MHQ=14,000Sm3/h the station will be able to meet only a very limited increase in customer demand. It is very likely that the station will not have sufficient spare capacity to permanently supply Doboy Gate Station high-pressure steel network (after Caltex is disconnected in second half of 2010).

ESTIMATED COST

Budget cost estimate is based on current schedule of rates with contractor selected through a public tender process, actual material and direct labour costs and applicable overhead charges and historical actual costs on similar projects. All costs are in $ Real 09/10.

Option 1

Cost estimate by activity:

• New piping with filtration and pressure reduction sections	$190,000
• New high-pressure metering section	$ 90,000
• New odorisation unit	$ 85,000
• Electrical installation and earthing upgrade	$120,000
• **TOTAL**	**$485,000**

Cost estimate by type:

• Material	$291,000
• Direct labour	$ 72,750
• Contractors	$ 24,250

- Overheads $ 97,000
- **TOTAL** **$485,000**

Option 2

Cost estimate by activity:

- New filters, pressure regulators and valves $175,000
- New odorisation unit $ 85,000
- Electrical installation and earthing upgrade $120,000
- **TOTAL** **$380,000**

Cost estimate by type:

- Material $228,000
- Direct labour $ 57,000
- Contractors $ 19,000
- Overheads $ 76,000
- **TOTAL** **$380,000**

Option 3

Cost estimate by activity:

- Spare odorisation unit $ 65,000
- Electrical installation and earthing upgrade $120,000
- **TOTAL** **$185,000**

Cost estimate by type:

- Material $ 85,000
- Direct labour $ 48,000
- Contractors $ 15,000
- Overheads $ 37,000
- **TOTAL** **$185,000**

PLAN FOR EFFECTIVE EXECUTION

The basic requirement for conforming capital expenditure specified in Rule 79(1) is that the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

APT Allgas has outsourced its capital works program (material and labour) through a public tender process, thereby obtaining a market price with respect to the provision of these services.

It is planned to continue testing the market at regular intervals to ensure lowest sustainable cost is maintained. Competitive tendering for supply of material is planned to be organised annually, and for provision of capital works services in 2 to 3 years intervals.

JUSTIFICATION

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The basic requirements for justification of conforming capital expenditure specified in Rule 79(2) are as follows:

The capital expenditure must be justifiable on one of the following grounds;

a. The overall economic value of the expenditure is positive, or
b. The present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure, or
c. The capital expenditure is necessary;
    i. To maintain and improve the safety of services, or
    ii. To maintain integrity of services, or
    iii. To comply with regulatory obligation or requirement, or
    iv. To maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependant on an expansion of pipeline capacity); or
d. The capital expenditure is an aggregate amount divisible into two parts, one referable to incremental services and the other referable to a purpose referred to in paragraph "c", and the former is justifiable under paragraph "b" and the latter under paragraph "c".

This capital expenditure is justified as:

- It is necessary to meet environmental requirements for reduced station noise;
- It is necessary to comply with regulatory requirement to provide proper gas odourisation at all times;
- It is necessary to upgrade the station electrical installation and earthing to meet safety requirements;
- It is necessary to maintain capacity to meet existing customers demand ;
- It is necessary to maintain integrity of services with back up supply to customers connected to Doboy Gate Station high-pressure steel network;
- The present value of the expected incremental revenue to be generated as a result of the relevant part of this expenditure exceeds the present value of this part of capital expenditure.

RECOMMENDATION

It is recommended to accept Option 1 and construct a new gate station at the same location as the existing gate station. This option will meet all critical regulatory, environmental and safety requirements, maintain integrity of supply to existing customers and provide additional spare capability to meet potential future customer demands including capability to supply current customers (after disconnection of Caltex) for Doboy high-pressure network.

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ATTACHMENTS

1. Tingalpa Gate Station layout plan
2. Tingalpa Gate Station network
3. Risk mitigation

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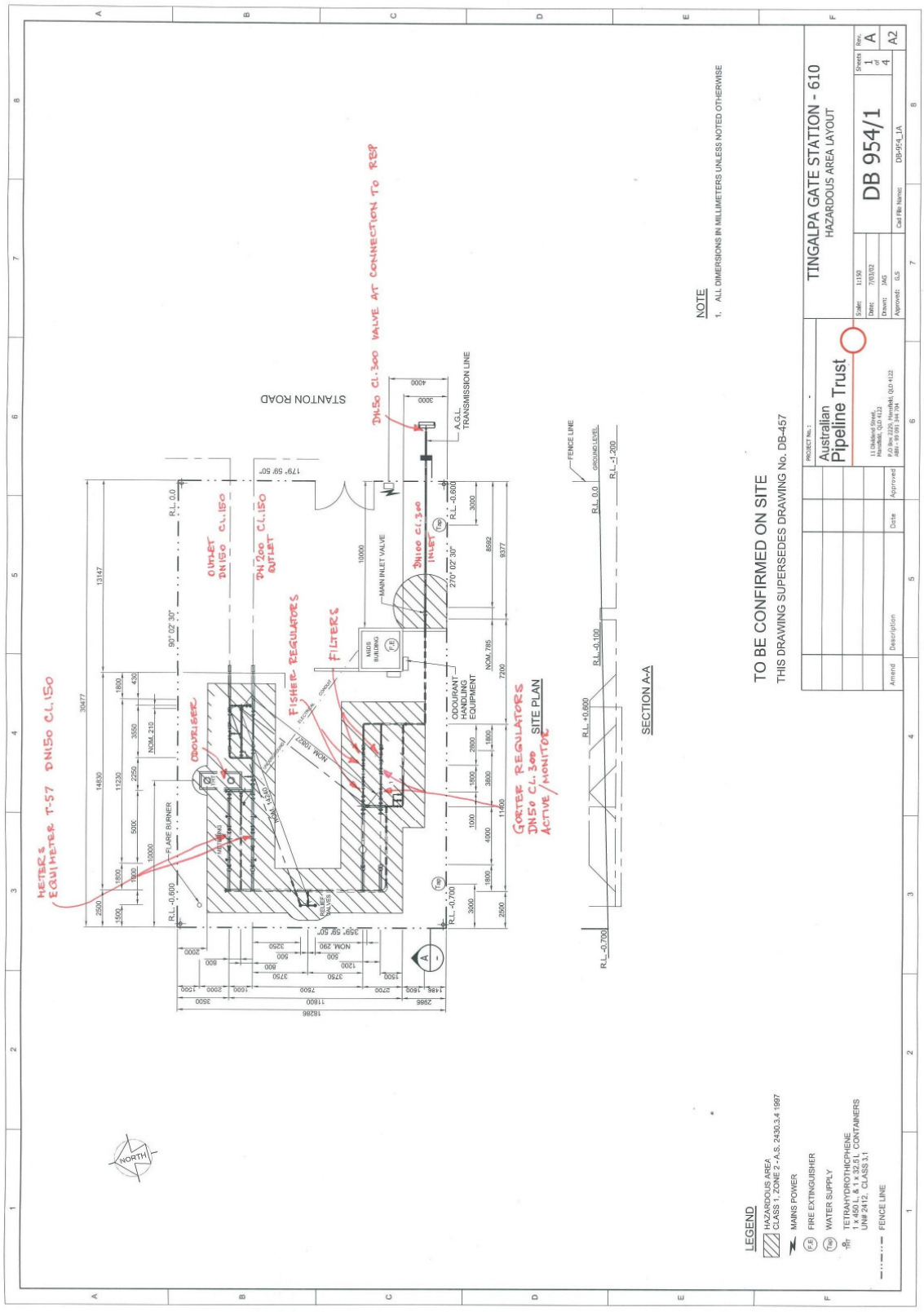

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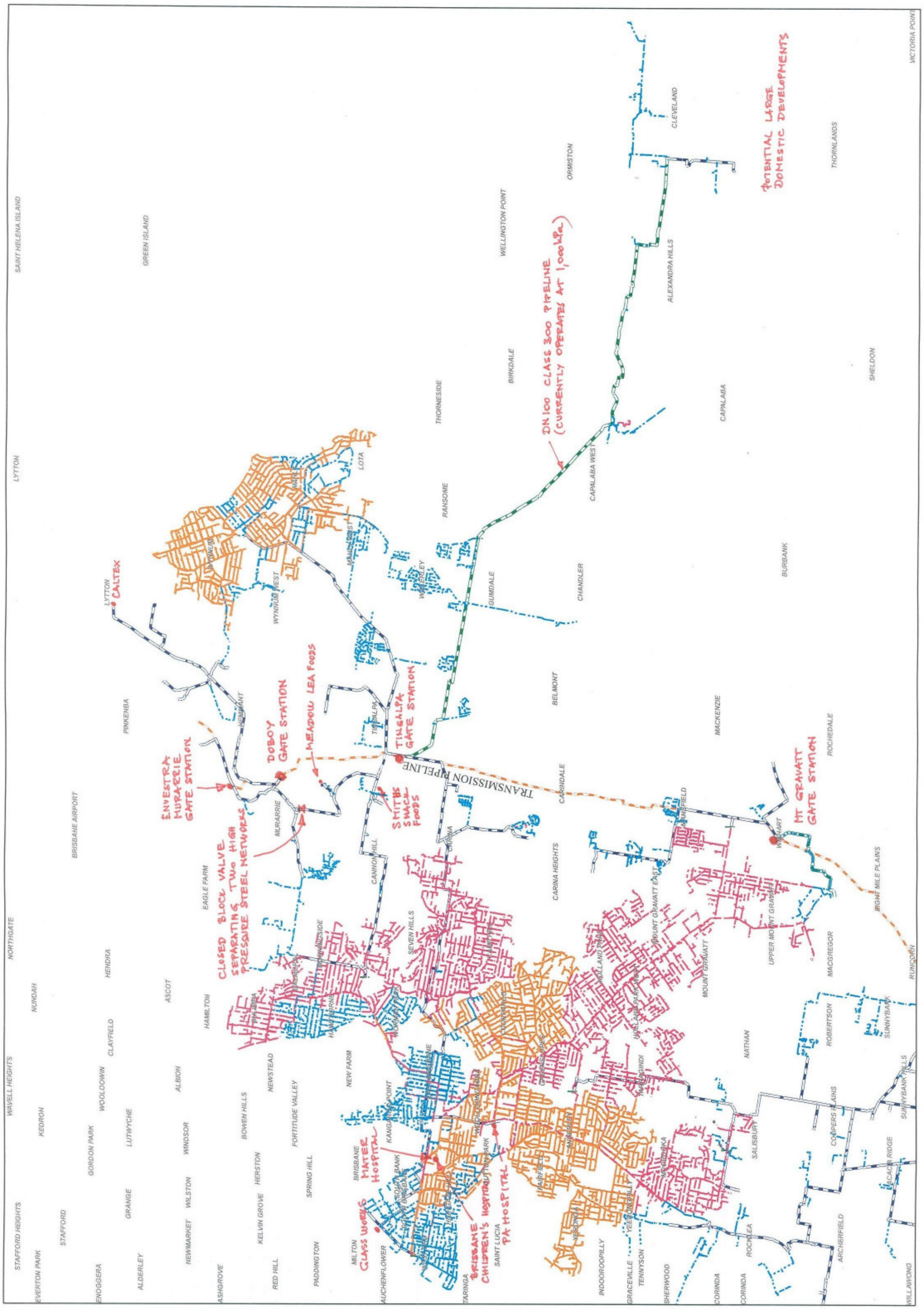

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Submission Form

Risk Mitigation

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Asset Details

State	Queensland	Asset Manager	xxx
Owner	APA Group	Approving Manager	xxx
Asset	Natural Gas Distribution Network		
CAPEX A/C no	xxxxx		

CURRENT UNTREATED RISK

Project Title Upgrade Tingalpa Gate Station
Description Minimise identified risks related to public and operational safety, regulatory and environmental compliance and customer demands to acceptable level
Risk Description Identified risks related to public and operational safety, regulatory and environmental compliance and capability to meet customer demands

	Consequences							
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Budget Priority
Severity	Severe	Minor	Severe	Minor	Moderate	Moderate		
	Hospitalisation Single permanent injury	Less than $1m Change to Project Budget	Loss of service to less than 10,000 tariff customers / day, or few contract customers	Localised incident immediately contained	Non-compliance with statutory, licence, regulations Compulsary explanation to Regulator	Adverse comments in local media Public statement required		
Likelihood	Possible	Likely	Possible	Likely	Possible	Possible		
	Might occur at some time At least once every 10 years	Will occur in most circumstances At least once every 3 years	Might occur at some time At least once every 10 years	Will occur in most circumstances At least once every 3 years	Might occur at some time At least once every 10 years	Might occur at some time At least once every 10 years		
Risk Score	13	7	13	7	8	8	56	Priority 2

PROPOSED RISK TREATMENTS

Option 1
Construct new gate station on same location as existing Tingalpa Gate Station

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	No risk	No risk	Severe	No risk	No risk	No risk				
	No risk	No risk	Loss of service to less than 10,000 tariff customers / day, or few contract customers	No risk	No risk	No risk				
Likelihood	None	None	Unlikely	None	None	None		485,000	0	10,319
	None	None	Could occur at some time At least once every 25 years	None	None	None				
Risk Score	-	-	9	-	-	-	9			

Option 2
Upgrade existing Tingalpa Gate Station to meet safety, regulatory and environmental requirements

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	No risk	Minor	Severe	No risk	No risk	Minor				
	No risk	Less than $1m Change to Project Budget	Loss of service to less than 10,000 tariff customers / day, or few contract customers	No risk	No risk	Isolated localised public complaints				
Likelihood	None	Likely	Unlikely	None	None	Likely		380,000	0	11,515
	None	Will occur in most circumstances At least once every 3 years	Could occur at some time At least once every 25 years	None	None	Will occur in most circumstances At least once every 3 years				
Risk Score	-	7	9	-	-	7	23			

Option 3
Upgrade existing Tingalpa Gate Station to meet only critical safety, regulatory and environmental requirements with increased operational costs

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	No risk	Minor	Severe	Minor	Minor	Moderate				
	No risk	Less than $1m Change to Project Budget	Loss of service to less than 10,000 tariff customers / day, or few contract customers	Localised incident immediately contained	Technical non-compliance with statutory, licence, regulations Voluntary explanation to Regulator	Adverse comments in local media Public statement required				
Likelihood	None	Almost Certain	Unlikely	Possible	Possible	Possible		185,000	10,000	14,250
	None	Expected in most circumstances At least once per year or more	Could occur at some time At least once every 25 years	Might occur at some time At least once every 10 years	Might occur at some time At least once every 10 years	Might occur at some time At least once every 10 years				
Risk Score	-	11	9	4	4	8	36			

Risk SIB - Tingalpa Gate Station 18-09-09.xls
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Business Case

Asset Owner:	**APT Allgas Energy Ltd**
Asset:	**Queensland Natural Gas Distribution Network**
Project:	**REINFORCEMENT OF EXISTING HIGH-PRESSURE STEEL NETWORK SUPPLYING NATURAL GAS TO SURFERS PARADISE AND BROADBEACH**
Submitted to:	**Sashie Naidoo, Manager Queensland Networks**
Prepared by:	**Stevan Gajinov, Strategic Planning Engineer**
Date:	**8th August 2010**

PURPOSE

This business case supports the proposed capital expenditure project to reinforce the high-pressure steel network supplying Surfers Paradise and Broadbeach.

BACKGROUND

The Gold Coast Region has the highest growth in customer numbers and consumption in APT Allgas Network. Surfers Paradise, Broadbeach and Southport are inner suburbs with the highest density of commercial customers and high-rise buildings.

Existing high-pressure steel network was constructed in the early 1990's and currently operates with very limited spare capacity in sections supplying Surfers Paradise and Broadbeach. The high-pressure steel network in Southport was reinforced with a new DN100 class 300 pipeline 5.1km long in 2005 to be able to meet large additional demand from multiple residential towers and the large number of commercial customers as a result of the Sea-change Development.

The high-pressure steel network supplying Surfers Paradise and Broadbeach has MAOP of 1,050kPa and currently operates at inlet pressure of 1,000kPa. At the peak winter customer demand, pressure at extremities of this network drops below 600kPa. This network supplies high-pressure polyethylene network that operates at 250kPa. Most customers are connected directly to polyethylene network.

There are total of 600 domestic and 650 commercial customers supplied through this network with a total connected load of approximately 19,150Sm3/h and actual diversified total peak load of 3,280Sm3/h (with average diversity factor of 0.17). The estimated current spare capacity for supply to Broadbeach and Surfers Paradise is only 350Sm3/h (13GJ/h) based on lowest mean temperature in last 20 years (4.2ºC lower than lowest mean temperature for winter 2009).

Current forecast for total diversified customer consumption supplied through the high-pressure steel network in Surfers Paradise and Broadbeach is shown on chart below.

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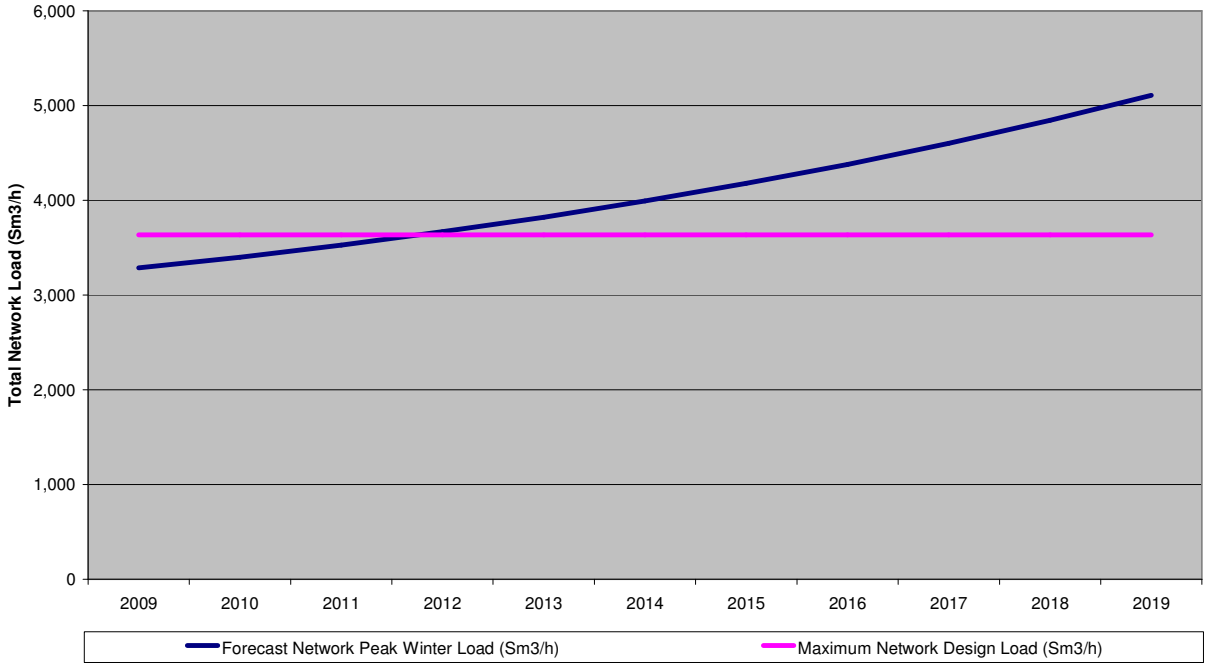
High-Pressure Steel Network Broadbeach and Surfers Paradise



IDENTIFICATION OF NEED

Based on available information and current peak load forecast for this network, the identified critical needs are to:

1. Meet forecast demand of all connected customers in winter 2013, if a one in 20 coldest peak day is experienced;
2. Meet high additional forecast demand of all new customers that will require connection to natural gas supply in this area after winter 2013;
3. Improve safety of supply to more than 1,200 customers.

When new customers are connected to the natural gas distribution network, the network operator is accepting responsibility to supply agreed maximum hourly quantity of natural gas at any time under normal condition. This gas distribution network has a large number of customers with total agreed hourly load much higher than required network capacity, due to load diversity. There are continuous changes in maximum load that the network has to transport due to individual customer's peak demand increase, changes in peak load diversity, weather changes, changes in network configuration and operation etc. Every winter, pressure surveys are completed for critical network points to ensure that capability to meet requirements of existing customers is maintained.

Based on historical customer consumption growth and current new customer enquires, it is estimated that existing high-pressure steel network will be not able to meet demand of all existing customers in winter 2013 if we experience a one in 20 year coldest day. To be able to meet those existing customers demand it is necessary to reinforce existing high-pressure steel network.

In addition, it is estimated that there will continue high demand for new mostly commercial customer connections, with estimated diversified peak hourly load increasing between 100Sm3/h and

300Sm3/h each year. To be able to meet future customer demand it is necessary to reinforce existing high-pressure steel network.

The existing network consist of more than 15km long and 20 years old high-pressure steel mains with one way supply through single district regulator. Any major failure of district regulator or main including third party damage will result in loss of supply to a large number of mostly commercial customers. There is an opportunity to significantly improve safety of supply and capability of the network to respond in emergency situations in this area by establishing an additional supply point and maintain two way supply for most of this network.

RISK ASSESSMENT

The existing high-pressure steel network currently has very limited spare capacity (and is reduced every year with new customer connections). It is estimated that in winter 2013 there is very high probability that available spare capacity for high-pressure steel network supplying Surfers Paradise and Broadbeach will be not sufficient to meet existing customer demands if there is a one in 20 year coldest day or if existing customers slightly increase their average peak winter demand (change of load diversity or increase of hourly demand).

The major risk is potential loss of supply to large number of domestic and especially critical commercial customers (with potentially high level of compensation claims). This potential high level outage with adverse reports in the local and national media can have long term impact on customer's perception of natural gas being a safe and reliable source of energy.

A further risk is loss of revenue from potential new customers that we will be not able to supply from the existing network.

A Risk Mitigation Form is attached showing current risk assessment and estimated risk levels for all alternative risk mitigation options.

EVALUATION OF ALTERNATIVES

<u>Option 1</u>

This option includes the following:

- Connection to end of existing DN100 class 300 steel pipeline at Southport;
- Establishment of new district regulator pit suitable to transport up to 4,000Sm3/h at inlet pressures from 1,500kPa to 5,000kPa and outlet pressure from 900kPa to 1,050kPa;
- Extension of new DN100 class 150 pipeline approximately 3.3km long in Ferry Road to Slatyer Avenue; and
- Connect to existing DN100 class 150 steel pipeline in Slatyer Avenue.

Indicative budget cost for this option is $2.35m.

It is estimated that this option will increase capacity of existing high-pressure network by approximately 4,000Sm3/h. This will be sufficient to meet future customers demand at approximately 2030. 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.

<u>Option 2</u>

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ARSN 091 678 778

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This option includes activities as follows:

- Connection to end of existing DN100 class 150 steel pipeline in Gooding Drive corner Boowaggan Road, Merrimac;
- Extension of new DN100 class 150 pipeline approximately 5.5km long in Gooding Drive, Nerang Broadbeach Road, Bermuda Street, Rudd Street and Rio Vista Boulevard; and
- Connect to existing DN100 class 150 steel pipeline in T E Peters Drive.

Indicative budget cost for this option is $3.66m.

It is estimated that Option 2 will increase capacity of existing high-pressure network by approximately 2,000Sm3/h. This will be sufficient to meet future customers demand at approximately 2020. An additional benefit is establishment of a high-pressure ring main that will improve reliability of supply to Merrimac, Broadbeach, Ashmore, Benowa and Bundall.

Option 3

This option includes activities as follows:

- Connection to end of existing DN100 class 300 steel pipeline in Ferry Road corner Pinter Avenue, Southport;
- Establishment of new district regulator pit suitable to transport up to 3,500Sm3/h at inlet pressures from 1,500kPa to 5,000kPa and outlet pressure from 900kPa to 1,050kPa;
- Extension of new DN100 class 150 pipeline approximately 2.5km long in Meron Street, Queen Street, Gold Coast Highway over Gold Coast Bridge and Breaker Street; and
- Connect to existing DN100 class 150 steel pipeline in Breaker Street.

It is estimated that Option 3 will increase capacity of existing high-pressure network by approximately 3,500Sm3/h. This will be sufficient to meet future customers demand at approximately 2027. An additional benefit is the establishment of high-pressure ring main that will improve reliability of supply to Southport, Surfers Paradise, Main Beach, Broadbeach, Ashmore, Benowa and Bundall.

There are major problems for implementation of this option related to extremely difficult water/bridge crossing and planned future work on existing bridge. It is not possible to implement this option in the near future.

Option 4

This option includes activities as follows:

- Connection to end of existing DN100 class 300 steel pipeline at Southport;
- Establishment of new district regulator pit suitable to transport up to 4,000Sm3/h at inlet pressures from 1,500kPa to 5,000kPa and outlet pressure from 900kPa to 1,050kPa;
- Extension of new DN100 class 150 pipeline approximately 3.4km long in Benowa Road to Slatyer Avenue; and
- Connect to existing DN100 class 150 steel pipeline in Slatyer Avenue.

Indicative budget cost for this option is $1.89m.

It is estimated that Option 4 will increase capacity of existing high-pressure network by approximately 1,000Sm3/h. This will be sufficient to meet future customers demand at

approximately 2016. Additional benefit is and establishment of high-pressure ring main that will improve reliability of supply to Southport, Ashmore and Benowa.

This option has the lowest estimated costs but provides minimal network improvements.

PLAN FOR EFFECTIVE EXECUTION

Basic requirement for conforming capital expenditure specified in National Gas Rules 2008 Section 79(1) is that the capital expenditure must be that which would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

APT Allgas has outsourced its capital works program (material and labour) through a public tender process, thereby obtaining a market price with respect to the provision of these services.

The plan is to continue to test the market at regular intervals to ensure that the proposed project will be executed at the lowest sustainable cost. Competitive tendering for supply of material is planned to be organised annually and for provision of capital works services in 2 to 3 years intervals.

Contractor for this project will be selected on invitation tender process from previously selected approved contractors.

JUSTIFICATION

Basic requirements for justification of conforming capital expenditure specified in Rule 79(2) are as follows:

The capital expenditure must be justified on one of the following grounds:

a. The overall economic value of the expenditure is positive; or
b. The present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or
c. The capital expenditure is necessary:
    i. To maintain and improve the safety of services; or
    ii. To maintain integrity of services; or
    iii. To comply with regulatory obligation or requirement; or
    iv. To maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependant on an expansion of pipeline capacity); or
d. The capital expenditure is an aggregate amount divisible into two parts, one referable to incremental services and the other referable to a purpose referred to in paragraph "c", and the former is justifiable under paragraph "b" and the latter under paragraph "c".

This capital expenditure is justified as follows:

1. It is necessary to maintain the network capacity to meet forecasted levels of existing customers demand at winter 2012
2. To improve safety of supply to existing customers and

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3. The present value of the expected incremental revenue from forecast new customers exceeds the present value of the total capital expenditure including additional cost to connect potential new customers to network.

RECOMMENDATION

Option 1 is recommended to reinforce the existing high-pressure steel network supplying natural gas to Surfers Paradise and Broadbeach. This option has the second lowest estimated costs but provides highest network capacity increase and is the best long term solution for this area.

ATTACHMENTS

1. Concept Plan for Reinforcement of Existing High-Pressure Steel Network Supplying Surfers Paradise and Broadbeach
2. Risk mitigation

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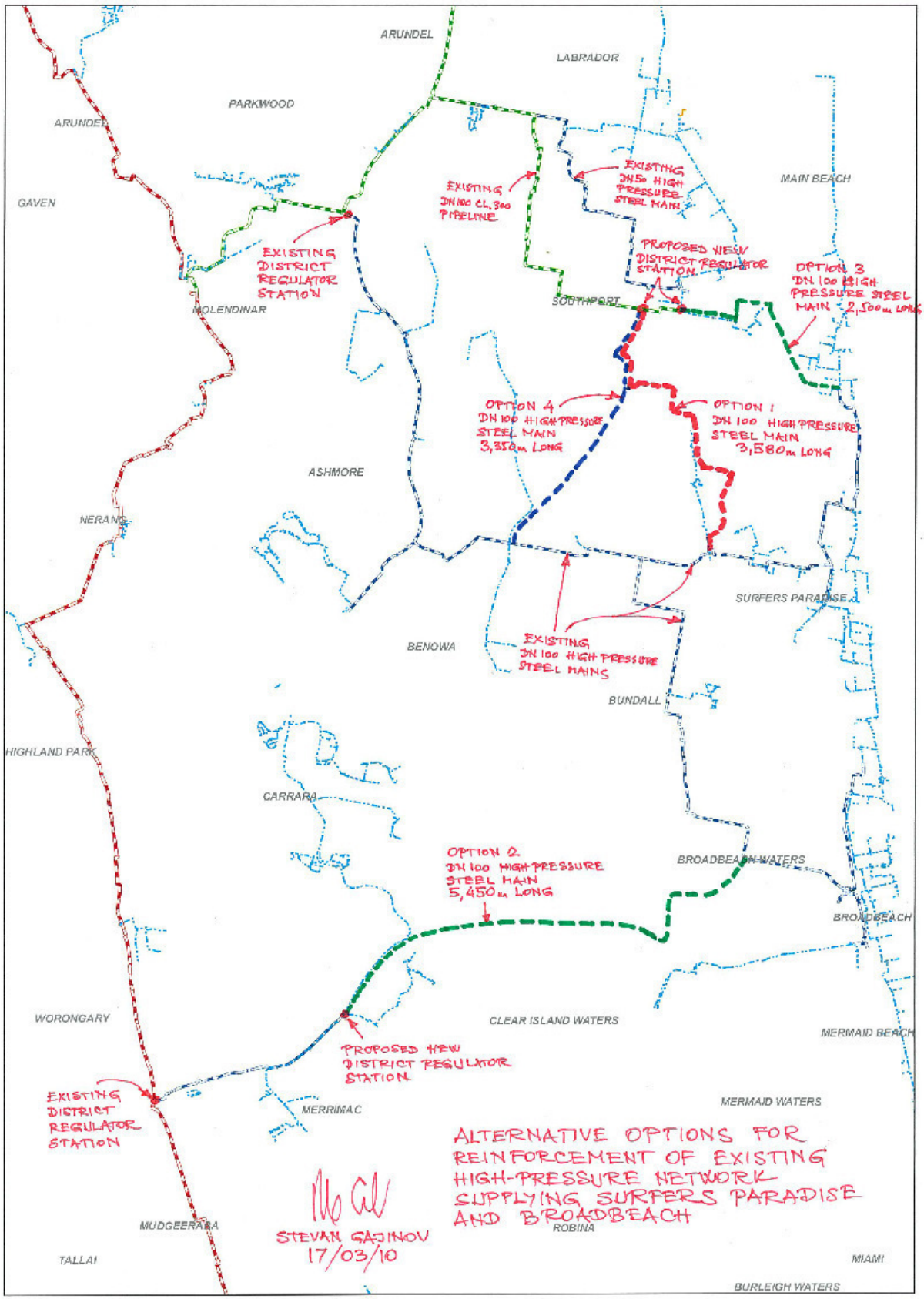

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Submission Form

Risk Mitigation

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Asset Details

State	Queensland	Asset Manager	xxx
Owner	APA Group	Approving Manager	xxx
Asset	Natural Gas Distribution Network		
CAPEX A/C no	xxxxx		

CURRENT UNTREATED RISK

Project Title	Surfers Paradise and Broadbeach high-pressure steel network reinforcement
Description	Reinforcement of existing high-pressure network supplying Surfers Paradise and Broadbeach
Risk Description	Based on forecast maximum hourly load, high-pressure steel network will not have sufficient spare capacity to meet demands of customers existing at winter 2012

	Consequences						Total Risk Score	Budget Priority
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation		
Severity	No risk	Minor	Moderate	No risk	Moderate	Moderate		
	No risk	Less than $1m Change to Project Budget	Short term localised service interruptions to less than 1,000 tariff customers / day or 1 contract customer	No risk	Non-compliance with statutory, licence, regulations Compulsary explanation to Regulator	Adverse comments in local media Public statement required		
Likelihood	None	Likely	Likely	None	Likely	Likely		
	None	Will occur in most circumstances At least once every 3 years	Will occur in most circumstances At least once every 3 years	None	Will occur in most circumstances At least once every 3 years	Will occur in most circumstances At least once every 3 years		
Risk Score	-	7	12	-	12	12	43	Priority 2

PROPOSED RISK TREATMENTS

Option 1

Reinforce existing high-pressure steel network with new DN100 high-pressure steel link main in Ferry Road, Southport, approximately 3.6km long

	Consequences						Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation				
Severity	No risk	Minor	Moderate	No risk	Minor	Moderate				
	No risk	Less than $1m Change to Project Budget	Short term localised service interruptions to less than 1,000 tariff customers / day or 1 contract customer	No risk	Technical non-compliance with statutory, licence, regulations Voluntary explanation to Regulator	Adverse comments in local media Public statement required				
Likelihood	None	Unlikely	Unlikely	None	Unlikely	Unlikely		2,350,000	0	81,034
	None	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	None	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years				
Risk Score	-	2	5	-	2	5	14			

Option 3

Reinforce existing high-pressure steel network with new DN100 high-pressure steel link main approximately 5.5km long in Nerang Broadbeach Road

	Consequences						Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation				
Severity	No risk	Minor	Moderate	No risk	Minor	Moderate				
	No risk	Less than $1m Change to Project Budget	Short term localised service interruptions to less than 1,000 tariff customers / day or 1 contract customer	No risk	Technical non-compliance with statutory, licence, regulations Voluntary explanation to Regulator	Adverse comments in local media Public statement required				
Likelihood	None	Unlikely	Unlikely	None	Unlikely	Unlikely		3,663,000	0	126,310
	None	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	None	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years				
Risk Score	-	2	5	-	2	5	14			

Option 4

Reinforce existing high-pressure steel network with new DN100 high-pressure steel link main in Benowa Road, Southport, approximately 3.4km long

	Consequences						Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation				
Severity	No risk	Minor	Moderate	No risk	Moderate	Moderate				
	No risk	Less than $1m Change to Project Budget	Short term localised service interruptions to less than 1,000 tariff customers / day or 1 contract customer	No risk	Non-compliance with statutory, licence, regulations Compulsary explanation to Regulator	Adverse comments in local media Public statement required				
Likelihood	None	Possible	Possible	None	Possible	Possible		1,890,000	0	126,000
	None	Might occur at some time At least once every 10 years	Might occur at some time At least once every 10 years	None	Might occur at some time At least once every 10 years	Might occur at some time At least once every 10 years				
Risk Score	-	4	9	-	8	8	28			

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APA Group

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Business Case

Asset Owner:	**APT Allgas Energy Pty Ltd**
Asset:	**Gas Distribution Network**
Project:	**SOUTH COAST SUPPLY PROJECT STAGE 2**
Submitted to:	**Sashie Naidoo, Manager Queensland Networks**
Prepared by:	**Stevan Gajinov, Strategic Planning Engineer**
Date:	**8th August 2010**

PURPOSE

This business case recommends construction of Stage 2 of South Coast pipeline for the estimated cost of $7.14M dollars. The project is planned for completion by 2016 to ensure continuity of reliable supply to the South Coast Region.

BACKGROUND

A single 85 km long DN150 steel pipeline was constructed in 1989 to act as a feeder pipeline to the South Coast Region to introduce natural gas from Roma Brisbane Pipeline to the Gold Coast. Since the time of its construction, some 30 district regulator stations have been constructed along the route of the pipeline. Local distribution networks are now drawing gas from these district regulator stations.

Ten years ago APT Allgas identified that the existing feeder pipeline would have insufficient capacity to support ongoing growth of the gas business in the South Coast Region.

In 2002 APT Allgas engaged Worley Consultants to perform a feasibility study for the Brisbane Gas Distribution Augmentation Project. This project had the key target of providing the necessary capacity reinforcement for the natural gas supply to the South Coast Region.

Further to Worley's feasibility report, GCI-Kenny Pty Ltd was engaged to analyse multiple options and operational aspects of the distribution system, with the ultimate aim of upgrading the existing high-pressure distribution networks in the Brisbane Region to meet the expected future demand for the South Coast Region.

Based on the outcome of the feasibility reports, construction of a 36km long 200DN class 600 steel pipeline from the existing Ellen Grove Gate Station to the Yatala Industrial Estate in 3 stages was recommended.

APT Allgas decided to implement this recommendation in 3 Stages, with the Stage 1, 12.4km of 200mm high pressure pipeline completed in 2006, within the 2001-06 AA period.

In 2006, APT Allgas recommended to the Queensland Competition Authority (QCA) that Stage 2 of overall design concept proceed, with a target completion date of 2010. The QCA accepted this

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$5.88m (Real 2005-06) project as prudent Capex in the 2006-11 Access Arrangement period. Stage 2 comprises the construction of 10.2 km of 200mm pipeline from the end of Stage 1 to Logan Reserve, and connection to the existing South Coast feeder pipeline.

Due to slower demand growth in South Coast Region than previously anticipated, and better input pressure secured from Roma Brisbane Pipeline, APT Allgas was able to postpone the construction of Stage 2.

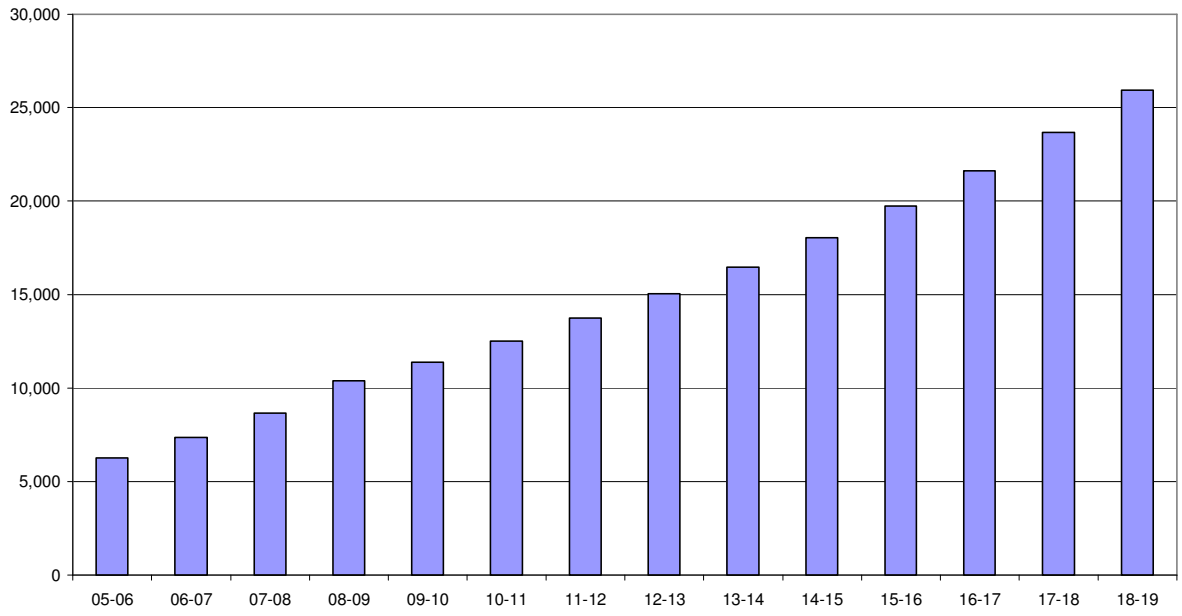
The recommended project in this business case is to proceed with implementation of Stage 2 in period between 2013 and 2016, at the budgeted capex of $7.14m (Real 2010-11). The construction of Stage 2 is required to be completed before winter 2016 to ensure gas supply reliability for the region.

Stage 3, the last section of the overall design, will consist of a further extension of the pipeline for approximately 12.9km, from Logan Reserve to corner of Paterson and Stanmore Roads, Yatala, with a third connection to the South Coast Pipeline. Implementation of Stage 3 will dependant on demand for natural gas in the South Coast Region.

Demand Forecast

Actual and forecast total customer numbers for the South Coast Region are shown below.

ACTUAL/FORECAST TOTAL RESIDENTIAL CUSTOMER NUMBERS FOR DISTRIBUTION NETWORK SUPPLYING SOUTH COAST REGION



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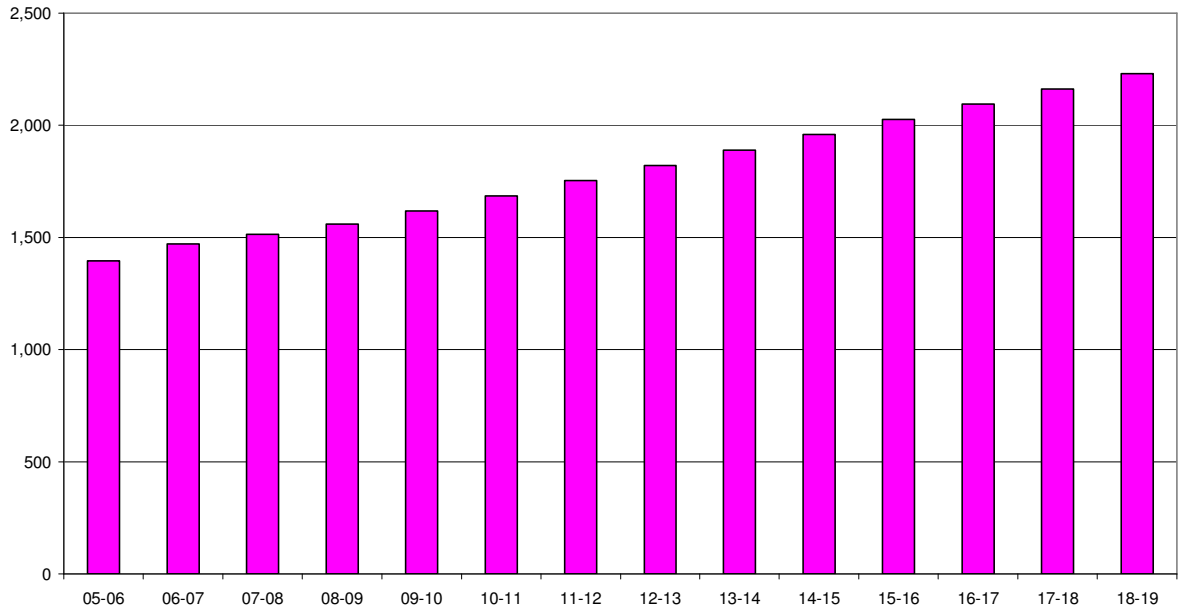
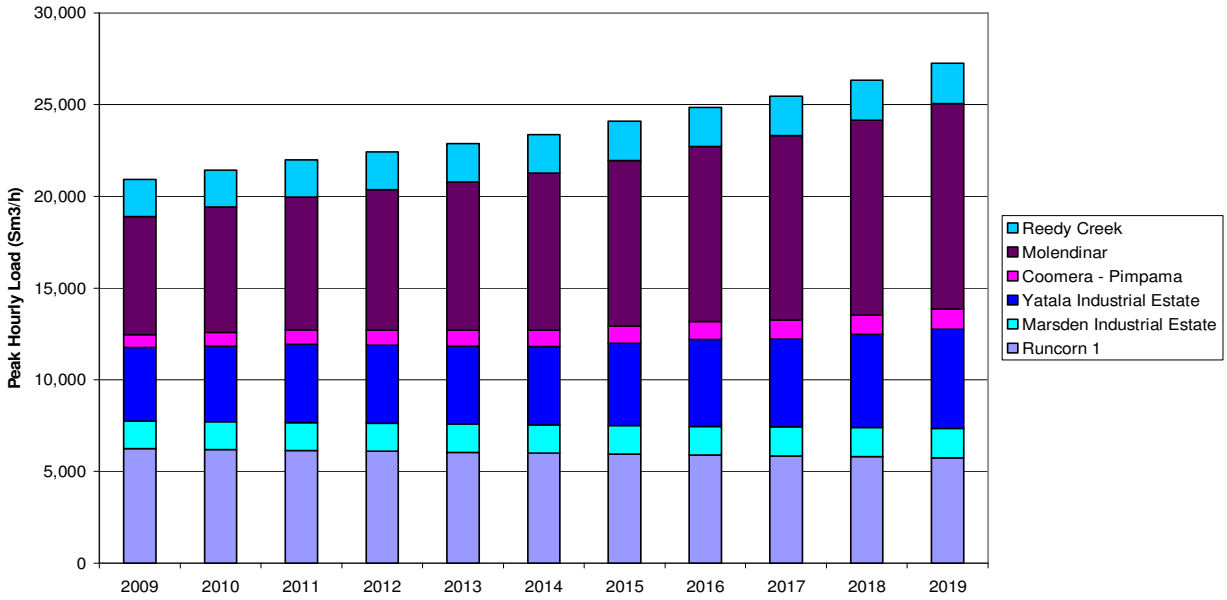
ACTUAL/FORECAST TOTAL INDUSTRIAL AND COMMERCIAL CUSTOMER NUMBERS FOR DISTRIBUTION NETWORK SUPPLYING SOUTH COAST REGION



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

Based on forecast increase in peak hourly loads in South Coast Networks, it is estimated that the existing feeder pipeline may insufficient capacity to meet customer demands in the winter of 2016.

PEAK HOURLY LOAD FORECAST FOR DISTRIBUTION NETWORK SUPPLYING SOUTH COAST REGION



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PEAK HOURLY DEMAND FORECAST (Sm3/h) - NETWORK SUPPLYING SOUTH COAST REGION

Sub-network	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Runcorn 1	6,241	6,191	6,141	6,091	6,041	5,991	5,941	5,891	5,841	5,791	5,741
Marsden Industrial Estate	1,500	1,510	1,520	1,530	1,540	1,550	1,560	1,570	1,580	1,590	1,600
Yatala Industrial Estate	4,000	4,126	4,278	4,262	4,260	4,272	4,487	4,727	4,803	5,092	5,411
Coomera - Pimpama	700	740	780	820	860	900	940	980	1,020	1,060	1,100
Molendinar	6,467	6,845	7,242	7,659	8,096	8,554	9,036	9,541	10,072	10,628	11,212
Reedy Creek	2,000	2,020	2,040	2,060	2,080	2,100	2,120	2,140	2,160	2,180	2,200
TOTAL	**20,908**	**21,432**	**22,001**	**22,422**	**22,877**	**23,367**	**24,084**	**24,849**	**25,476**	**26,341**	**27,264**

IDENTIFICATION OF NEED

A. Network Capacity Requirements

Forecast pressure profiles at critical supply points for the existing South Coast feeder are shown in the table below. These pressure profiles are based on actual supply pressures at peak demand for a typical 2009 winter day.

PRESSURE PROFILE FORECAST (kPa) - EXISTING FEEDER PIPELINE SUPPLYING SOUTH COAST REGION

Sub-network	2009	2010	2011	2012	2013	2014	2015	2016
Ellen Grove Gate Station	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450
Marsden Industrial Estate	4,275	4,267	4,258	4,251	4,244	4,235	4,223	4,209
Yatala Industrial Estate	3,674	3,614	3,547	3,494	3,434	3,368	3,268	3,153
Coomera - Pimpama	3,429	3,343	3,244	3,158	3,060	2,950	2,795	2,615
Molendinar	3,188	3,073	2,940	2,816	2,674	2,510	2,281	**2,003**
Reedy Creek	3,169	3,052	2,918	2,793	2,649	2,483	2,251	**1,968**

The minimum supply pressures at Molendinar and Reedy Creek off-takes are 2,200 kPa. Based on the above forecast pressure profile, the existing South Coast feeder pipeline will have insufficient capacity to meet this requirement in winter 2016.

B. Security of Supply

There is currently a potential risk with the South Coast pipeline regarding security of supply over 10,000 domestic and 1,500 commercial and industrial customers. The South Coast Region is currently supplied through the 90km long South Coast feeder pipeline. This pipeline is located in corridors with extremely high activity levels in realignment and alterations to existing road infrastructures, utility installations and other civil work related to new major developments. This means that there is high level of exposure to potential damage by third parties, including heavy machinery.

By providing a parallel, second source of supply to the South Coast Region, the proposed Stage 2 pipeline will partially mitigate the security of supply risk for the existing South Coast feeder pipeline by either failure due to third party damage or structural failure.

RISK ASSESSMENT

The existing supply pipeline currently has only limited spare capacity. This spare capacity is reduced every year with new customer connections. It is estimated that in winter 2016 available spare capacity will be insufficient to meet existing customer demands.

An additional risk is potential loss of supply to more than 10,000 domestic and 1,500 commercial and industrial customers should a major failure of the existing supply pipeline occur. The South

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Coast Region is currently supplied through a 90km long pipeline that is located in corridors with extremely high activities in realignment and alterations of existing road infrastructures, utility installations and other civil work related to new major developments. There is high level of exposure to potential damage by third party including heavy machinery.

A Risk Mitigation Form is attached which shows the current risk assessment and estimated risk levels for risk mitigation options.

EVALUATION OF ALTERNATIVES

Option 1 (Recommended Option)

Option 1 is for continuation of Stage 2 of the South Coast Supply Reinforcement Project. This includes construction of an additional 10.2km of DN200 class 600 pipeline from Browns Plains to the corner of School and Logan Reserve Roads, Logan Reserve, and a new connection to the Brisbane to Gold Coast Pipeline as per original proposal.

Based on actual costs for Stage 1, and an initial field investigation, the average unit cost for the Stage 2 pipeline extension is estimated to be $700/m. This comprises:

- Material cost $150/m
- Direct labour cost including supervision $ 30/m
- Contractors cost $450/m
- Planning, project management and other overheads $ 70/m

TOTAL UNIT COST $700/m

The total estimated cost for Stage 2, based on a length of 10,200m is $7.14m.

The forecast pressure profiles for existing feeder pipeline (up to and including winter 2015) and after Stage 2 (Option 1) reinforcement (from 2016 to 2019) is shown in table below.

PRESSURE PROFILE FORECAST (kPa) - EXISTING FEEDER PIPELINE AND DN200 STAGE 2 REINFORCEMENT SUPPLYING SOUTH COAST

Sub-network	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ellen Grove Gate Station	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450
Marsden Industrial Estate	4,275	4,267	4,258	4,251	4,244	4,235	4,223	4,209	4,198	4,181	4,163
Yatala Industrial Estate	3,674	3,614	3,547	3,494	3,434	3,368	3,268	3,624	3,566	3,482	3,388
Coomera - Pimpama	3,429	3,343	3,244	3,158	3,060	2,950	2,795	3,164	3,054	2,907	2,736
Molendinar	3,188	3,073	2,940	2,816	2,674	2,510	2,281	2,676	2,496	2,257	**1,962**
Reedy Creek	3,169	3,052	2,918	2,793	2,649	2,483	2,251	2,649	2,468	2,225	**1,925**

Option 2

Option 2 includes construction of a DN150 class 600 pipeline in stages 2 and 3 as an alternative to DN200 class 600.

Based on actual costs on similar projects, and initial field investigation, it is estimated an average unit cost for pipeline extension would be $630/m. This comprises:

- Material cost $110/m
- Direct labour cost including supervision $ 30/m
- Contractors cost $420/m
- Planning, project management and other overheads $ 70/m

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TOTAL UNIT COST $630/m

The total estimated cost for Stage 2, based on a length of 10,200m is $6.43m.

PRESSURE PROFILE FORECAST (kPa) - EXISTING FEEDER PIPELINE AND DN150 STAGE 2 REINFORCEMENT SUPPLYING SOUTH COAST

Sub-network	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ellen Grove Gate Station	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450
Marsden Industrial Estate	4,275	4,267	4,258	4,251	4,244	4,235	4,223	4,209	4,198	4,181	4,163
Yatala Industrial Estate	3,674	3,614	3,547	3,494	3,434	3,368	3,268	3,546	3,481	3,388	3,282
Coomera - Pimpama	3,429	3,343	3,244	3,158	3,060	2,950	2,795	3,074	2,954	2,793	2,605
Molendinar	3,188	3,073	2,940	2,816	2,674	2,510	2,281	2,570	2,374	**2,110**	**1,778**
Reedy Creek	3,169	3,052	2,918	2,793	2,649	2,483	2,251	2,543	2,344	**2,076**	**1,737**

Option 1 is the more cost effective option. As can be seen below, Option 1 will provide more additional capacity for less total unit cost than Option 2.

	Option 1	Option 2
Additional capacity (Sm3/h)	2,257	1,392
Average cost for additional capacity ($/Sm3/h)	2,808	3,684

Option 3

This option includes establishment of a compressor station connected to existing DN200 class 600 pipeline (Stage 1), that will increase operating pressure of DN150 Brisbane to Gold Coast Pipeline thereby increasing available capacity to South Coast Region.

In last 20 years large numbers of new domestic developments and other high consequence areas (including schools, child care centres etc.) have been established in the vicinity of the existing DN150 Brisbane to Gold Coast Pipeline. As a result of these developments, and as per the requirement of AS 2885 - Pipelines Gas and Liquid Petroleum, this pipeline can be operated only under the condition where rupture is not a credible failure mode. This means that the existing South Coast pipeline cannot be operated at operating pressures greater than 4,750kPa.

Currently, natural gas is supplied to the South Coast Pipeline from the Roma to Brisbane Pipeline, Metro Section that operates with MAOP=4,600kPa. The most common supply pressure to South Coast Distribution Network is 4,450 kPa. This means that any new compressor station would be limited to increasing the operating pressure of the pipeline by 200 kPa to maximum 500 kPa. The forecast pressure profile for this option is shown in table below.

PRESSURE PROFILE FORECAST (kPa) - EXISTING FEEDER PIPELINE AND ESTABLISHMENT OF COMPRESSOR STATION

Sub-network	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ellen Grove Gate Station	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,900	4,900	4,900	4,900
Marsden Industrial Estate	4,275	4,267	4,258	4,251	4,244	4,235	4,223	4,669	4,658	4,643	4,626
Yatala Industrial Estate	3,674	3,614	3,547	3,494	3,434	3,368	3,268	3,742	3,656	3,532	3,390
Coomera - Pimpama	3,429	3,343	3,244	3,158	3,060	2,950	2,795	3,298	3,158	2,966	2,739
Molendinar	3,188	3,073	2,940	2,816	2,674	2,510	2,281	2,832	2,622	2,332	**1,967**
Reedy Creek	3,169	3,052	2,918	2,793	2,649	2,483	2,251	2,807	2,595	2,301	**1,929**

Because there is a very limited possibility for increasing operating pressure after Stage 1 of South Coast Supply Reinforcement Project, it is recommended that this option is re-evaluated in more detail after completion of the pipeline extensions in Stages 2 and 3.

Option 4

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This option is similar to Option 3, with a new connection to the Roma to Brisbane Pipeline at Ellen Grove Regulator Station, establishment of a new gate station, construction of approximately 700m long DN200 class 600 pipeline link to existing DN200 class 600 pipeline, and installation of a new regulator station at the existing connection to Brisbane to Gold Coast Pipeline. That way we will increase operating pressure and available capacity for natural gas supply to South Coast Region.

Currently, the minimum operating pressure at the proposed new connection point is approximately 4,800kPa. Option 4 would increase operating pressure of Brisbane to Gold Coast Pipeline by 100 kPa to maximum 400 kPa. The forecast pressure profile for this option is shown in the following table.

PRESSURE PROFILE FORECAST (kPa) - EXISTING FEEDER PIPELINE AND ESTABLISHMENT OF NEW CONNECTION TO RBP

Sub-network	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ellen Grove Gate Station	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,800	4,800	4,800	4,800
Marsden Industrial Estate	4,275	4,267	4,258	4,251	4,244	4,235	4,223	4,564	4,553	4,537	4,520
Yatala Industrial Estate	3,674	3,614	3,547	3,494	3,434	3,368	3,268	3,611	3,522	3,394	3,246
Coomera - Pimpama	3,429	3,343	3,244	3,158	3,060	2,950	2,795	3,149	3,003	2,800	2,559
Molendinar	3,188	3,073	2,940	2,816	2,674	2,510	2,281	2,658	2,434	**2,119**	**1,711**
Reedy Creek	3,169	3,052	2,918	2,793	2,649	2,483	2,251	2,632	2,405	**2,085**	**1,669**

Based on actual cost on similar projects and initial field investigation it is estimated that indicative cost for this option is:

- Connection to RBP and establishment of new gate station $1,400,000
- Construction of DN200 class 600 pipeline 700 m long $ 600,000
- Establishment of new district regulator station $ 150,000
- TOTAL $2,150,000

Because there is very limited possibility for increase of operating pressure after Stage 1 of South Coast Supply Reinforcement Project, it is recommended that this option is re-evaluated after completion of pipeline extensions in Stages 2 and 3.

Option 5

This “do nothing” option involves zero capital expenditure. It comprises ceasing any load growth on the South Coast when there is no spare capacity in feeder pipeline. This option will result in limitations to APT Allgas’s ability to grow its network, and adverse reports in the local and national media that will have long term impact on APT Allgas’ reputation and customers’ perception of natural gas being a reliable source of energy.

Option 1 is considered to be the most cost effective option, with options 4 and 3 to be re-evaluated after completion of Stage 2.

PLAN FOR EFFECTIVE EXECUTION

The basic requirement for conforming capital expenditure specified in Rule 79(1) is that the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

APT Allgas has outsourced its capital works program (material and labour) through a public tender process, thereby obtaining a market price with respect to the provision of these services. It is planned to continue to test the market at regular intervals to ensure that the proposed project will be

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executed at the lowest sustainable cost. Competitive tendering for supply of material is planned to be organised annually, and for provision of capital works services at 2 to 3 years intervals.

The contractor for this project will be selected on invitation tender process from previously selected approved contractors.

JUSTIFICATION

This capital expenditure is justified on the following grounds:

- To maintain capacity to meet existing customer demand and to provide additional capacity to meet additional demand from existing and potential new customers;
- To improve safety of supply to existing customers in South Coast Region;
- To improve integrity of supply to South Coast Region;
- To reduce the potential impact of failure of the Brisbane to Gold Coast Pipeline.

RECOMMENDATION

It is recommended that Option 1 with 10.2km of DN200 class 600 pipeline extension for reinforcement of existing natural gas supply to South Coast Region be accepted. This option will have a total estimated cost of $7.14m. This option is the most cost effective way to provide necessary increase of supply capacity to South Coast Region whilst minimising current risk exposure.

ATTACHMENTS

1. Concept Plan for Stages 2 and 3 of South Coast Supply Reinforcement Project
2. Risk mitigation

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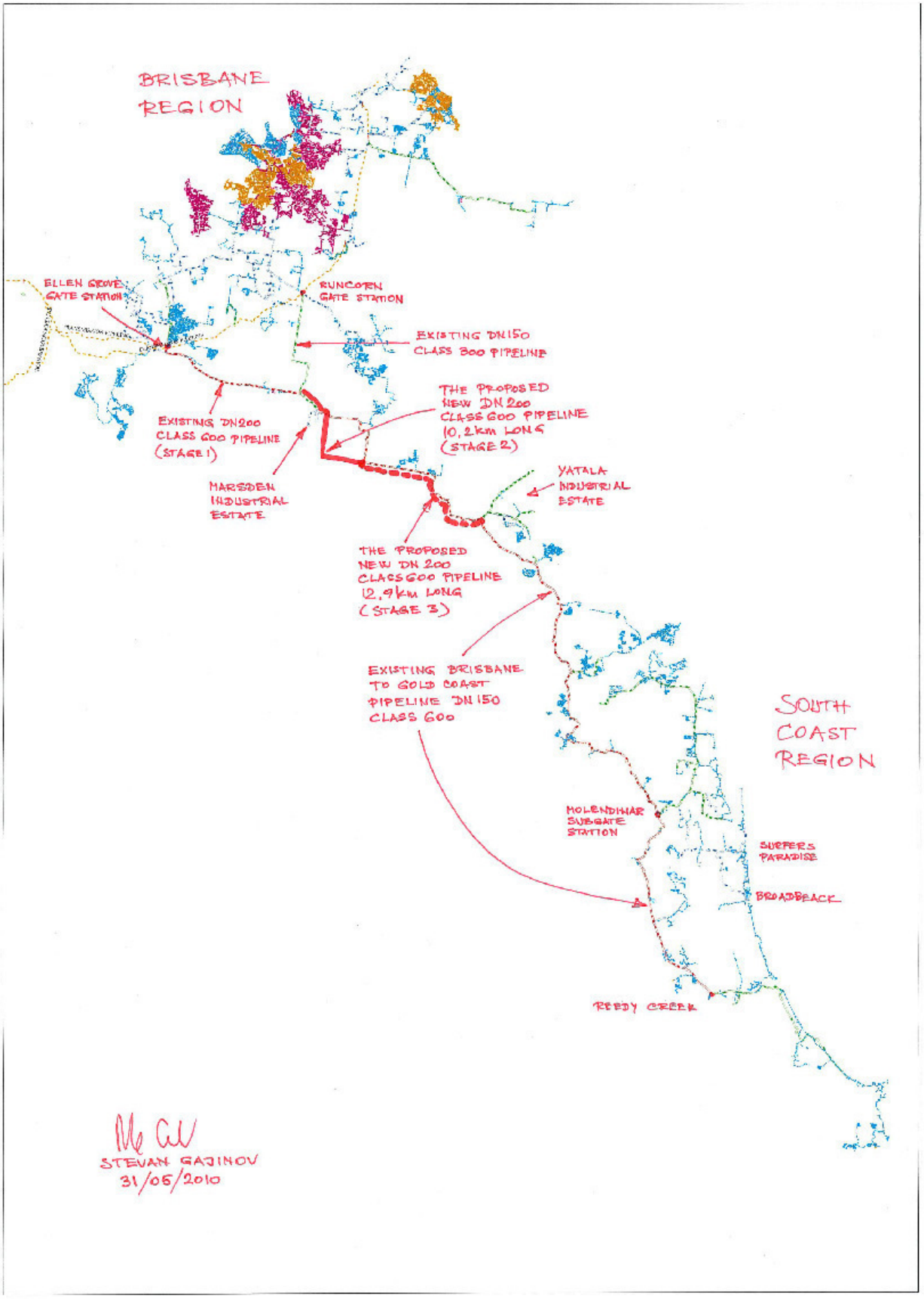

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Submission Form

Risk Mitigation

Go to Table of Contents

Asset Details

State	Queensland	Asset Manager	xxx
Owner	APA Group	Approving Manager	xxx
Asset	Natural Gas Distribution Network		
CAPEX A/C no	xxxxx		

CURRENT UNTREATED RISK

Project Title	South Coast Supply Reinforcement Project Stage 2
Description	
Risk Description	

	Consequences							
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Budget Priority
Severity	Severe	Severe	Major	Moderate	Moderate	Severe		
	Hospitalisation Single permanent injury	$5m - $20m Financial explanation to Market Regulators	Short term loss of service to more than 10,000 customers / day Area growth affected	Localised damage immediately contained. Reportable - no financial penalty	Non-compliance with statutory, licence, regulations Compulsory explanation to Regulator	Adverse comments in State media Widespread concern from investors, customers and regulators		
Likelihood	Unlikely	Possible	Unlikely	Unlikely	Unlikely	Possible		
	Could occur at some time At least once every 25 years	Might occur at some time At least once every 10 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	Might occur at some time At least once every 10 years		
Risk Score	9	13	14	5		13	54	Priority 2

PROPOSED RISK TREATMENTS

Option 1

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	Severe	Severe	Major	Moderate	Moderate	Severe				
	Hospitalisation Single permanent injury	$5m - $20m Financial explanation to Market Regulators	Short term loss of service to more than 10,000 customers / day Area growth affected	Localised damage immediately contained. Reportable - no financial penalty	Non-compliance with statutory, licence, regulations Compulsory explanation to Regulator	Adverse comments in State media Widespread concern from investors, customers and regulators				
Likelihood	Unlikely	Unlikely	Rare	Unlikely	Unlikely	Unlikely				
	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	May occur only in exceptional circumstances Less than once every 25 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years				
Risk Score	9	9	10	5	5	9	47	7,140,000	0	1,020,000

Option 2

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	Severe	Severe	Major	Moderate	Moderate	Severe				
	Hospitalisation Single permanent injury	$5m - $20m Financial explanation to Market Regulators	Short term loss of service to more than 10,000 customers / day Area growth affected	Localised damage immediately contained. Reportable - no financial penalty	Non-compliance with statutory, licence, regulations Compulsory explanation to Regulator	Adverse comments in State media Widespread concern from investors, customers and regulators				
Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely				
	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years				
Risk Score	9	9	14	5	5	9	51	6,426,000	0	2,142,000

Option 3

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	No risk	No risk	No risk	No risk	No risk	No risk				
	No risk	No risk	No risk	No risk	No risk	No risk				
Likelihood	None	None	None	None	None	None				
	None	None	None	None	None	None				
Risk Score	-	-	-	-	-	-	-		0	-

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Business Case

Asset Owner:	**APT Allgas Energy Pty Limited**
Asset:	**APT Allgas Natural Gas Distribution Network**
Project:	**METER CHANGE PROGRAM**
Submitted to:	**Sashie Naidoo, Manager Queensland Networks**
Prepared by:	**Stevan Gajinov, Strategic Planning Engineer**
Date:	**28th September 2010**

PURPOSE

This business case recommends a planned Meter Change Program for APT Allgas.

BACKGROUND

Asset description

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.

Management of meters is governed by the Queensland Gas Act, Regulations, and Distribution License requirements. The Gas Act requires meters to be changed at periodic intervals based on meter lifespans detailed in the APT Allgas Measurement Management Plan.

Domestic meter installations are designed not to require routine maintenance other than field-testing of meter families. Maintenance is limited to responding to isolated meter failures caused by blockages, external damage, failed mechanisms, etc. As part of the APT Allgas Measurement Management Plan, meters with a capacity of less than 25m3/hr 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. Meters with a capacity of up to 25 m3/h are suitable to be included in the Field Life Extension Program as defined in AS/NZS 4944-2006 Gas Meters – In Service Compliance Testing. Once these meter groups fail they will be removed, repaired/refurbished and returned to the field as new meters. This requirement results in between 1,000 and 2,000 periodic meter replacements per annum. Typically, approximately 4,000 meters with a capacity of less than 25m3/hr are identified as having reached the end of their useful life each year. Of these, approximately 1,000 will be repaired and the remainder will be condemned as not being suitable to be repaired.

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

The testing of gas meters ensures meter families remain within prescribed tolerances such that gas users are not disadvantaged. Due to the large number of gas meters in the network, APT employs a program that statistically tests populations of meters. The aim of testing is to discover, without

testing the entire population, how many of the sample are within tolerance. The tolerances set will then dictate the testing period of a meter, and subsequently, the life of a meter.

Generally, tolerances for error in metering are prescribed under Section 128 of the Petroleum and Gas (Production and Safety) Regulation 2004 pursuant to Section 635 of the Act. For meters measuring more than 25 cubic metres of gas in an hour, testing is prescribed by Section 127 of the Regulation pursuant to Section 637(1)(d) of the Act. Otherwise, testing is carried out according to AS/NZS 4944. The testing period is set such that it will detect when meters begin exhibiting errors beyond rehabilitation.

Meter Exchange and Testing Program - Practice prior to 2005

If a gas meter is not included in a sampling program, and it is not an Email 602 or Email 610 meter, then the gas meter belongs to the group subjected to Ten Year Testing. Every ten years, the gas meter was withdrawn from service, and sent to an approved supplier for refurbishment and recertification.

Before the introduction of the AS/NZS 4944, meter testing was carried out using attributes testing in accordance with AS1199. In addition, approval was given by the Government Gas Examiner to test meters younger than 15 years old in accordance with general inspection level I. Meters older than 15 years were to be tested using general inspection level II. General Inspection level I corresponds to the new standard (AS/NZS 4944) with respect to variables testing, whilst general inspection level II corresponds to attributes testing. In addition, for Email 602 meters, the Gas Examiner approved changing the Ten Year Test to a Thirteen Year Test.

A population would initially be tested for compliance within 10 years, and Email 602 meters within 13 years. The results would be analysed using attributes testing, and the batch passed or failed by referring to Table 2-A, AS1199. If the population passed, the meter test period would be reset for another year. If the population failed, the batch may be retested by re-sampled or redefining the population, or the entire population would need to be replaced. The tested meters were refurbished and returned to store with new test certificates. These meters were treated as if they were new, and were subsequently removed from the original population. The records were updated such that these meters were not tested again for 13 years. The remaining population was then subject to another sampling test in the following year, and every year until the population failed.

Meter Exchange and Testing Program - Practice post 2005

For diaphragm Meters < 25m3/hr, AS/NZS 4944 allows for a more descriptive approach to meter testing. More emphasis is placed on analysing results, and allowing for periods between sampling for on-going compliance. In introducing the new standard, the results of testing for 2005 will be analysed before applying the assumed period of 18 years to existing meter families. As no meter families will be significantly out-of-test, an older meter's on-going compliance period can be determined from previous testing. Instead of testing the population again next year we may increase this time by up to 4 years (depending on the results). All gas meters to be used in the APT Allgas Network for the purposes of measuring natural gas must be approved for use by APT Allgas. The approved meters are managed according to the Meter Measurement Scheme. New types of meters must undergo an acceptance process, with a final field test, before the meters are accepted as store stock and assigned a stock code. All gas meters are to be sealed after being successfully tested. APA uses a similar approach to the approvals process for repairing meters. Generally, all repair methods shall be to recognised local standards, and companies are to be approved, by either

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The Department of Fair Trade in NSW, or network operator in Queensland. The meter shall be tested after repair, with the results forward and retained.

Meter types and quantities

Currently there are more than 78,000 meters with capacity less than 25m^3/h and more than 1,000 meters with capacity of more than 25m^3/h. Total quantity of installed meters and quantity of meters due for testing are shown in two tables below:

METERS <25m3/h DUE FOR TESTING/CHANGE

Meter Type	Count	10/11	11/12	12/13	13/14	14/15	15/16
Ten Years Life Program							
TOYO MT-5	80	1	1	1	11		
EMAIL 600	78						
HIBBERD JUBILEE	35						
ROCKWELL MR-8	968	107	3	3			
ROCKWELL MRA-6	1						
Total domestic <25m3/h TYP							
Field Life Extension Program							
AMPY 1010	155						
AMPY 750	21,025						
EMAIL 602	30,875	492	1,102	475	2,602	7,689	3,474
EMAIL 610	15,658	971	1,369	1,311	1,941	2,063	551
GALLUS 2000	1,033	168	37	67	132	206	53
GALLUS G2.5	1,473	147	201	135	412	523	45
TOYO MD-2	2,494	168	88	23	716	1,039	330
TOYO ML-2500	3,615	556	396	144	192	141	28
Total domestic <25m3/h FLE							
AL-425	1,359	53	105	87	37	87	121
Total <25m3/h	**78,849**	**2,663**	**3,302**	**2,246**	**6,043**	**11,748**	**4,602**

METERS >25m3/h DUE FOR CHANGE

Meter Type	Count	10/11	11/12	12/13	13/14	14/15	15/16
Ten Years Life Program							
4GT	1						
AL-1000	303	29	11	2	13	19	29
AL-1400	25	5			2	1	
AL-2300	22	4		3	2		
AL-5000	13	3		1	1		
AL-800	104	10	9		8	2	1
AC-630	20						
ELSTER TRZ G160	1			1			
EQUIMETER T-35	1						
INSTROMET G400	1						
ROCKWELL T-18	1						
ROCKWELL T-30	1						1
ROCKWELL T-60	2						
ROMET RM1100	2						1
ROMET RM140	79	8	9	3	5	8	12
ROMET RM200	38	2	1	3	4	5	3
ROMET RM30	25	7	4				
ROMET RM300	44	1	3	4	2	2	2
ROMET RM40	100	9	14	3	18	12	18
ROMET RM450	16		2	1		1	
ROMET RM55	77	5	4	6	12	9	12
ROMET RM650	14	2		1	1	2	3
ROMET RM85	123	4	12	7	11	13	16
ROOTS 1.5M	18	1			1	1	
ROOTS 11M	3		1				
ROOTS 16M	5	1					
ROOTS 23M	1			1			
ROOTS 3M	18	5	1		1	2	1
ROOTS 5M	17	2	2	2		2	1
ROOTS 7M	3		2				
ROOTS 8C	8	1	1			1	
Total >25m3/h	**1,086**	**99**	**76**	**38**	**81**	**80**	**100**

Age profile

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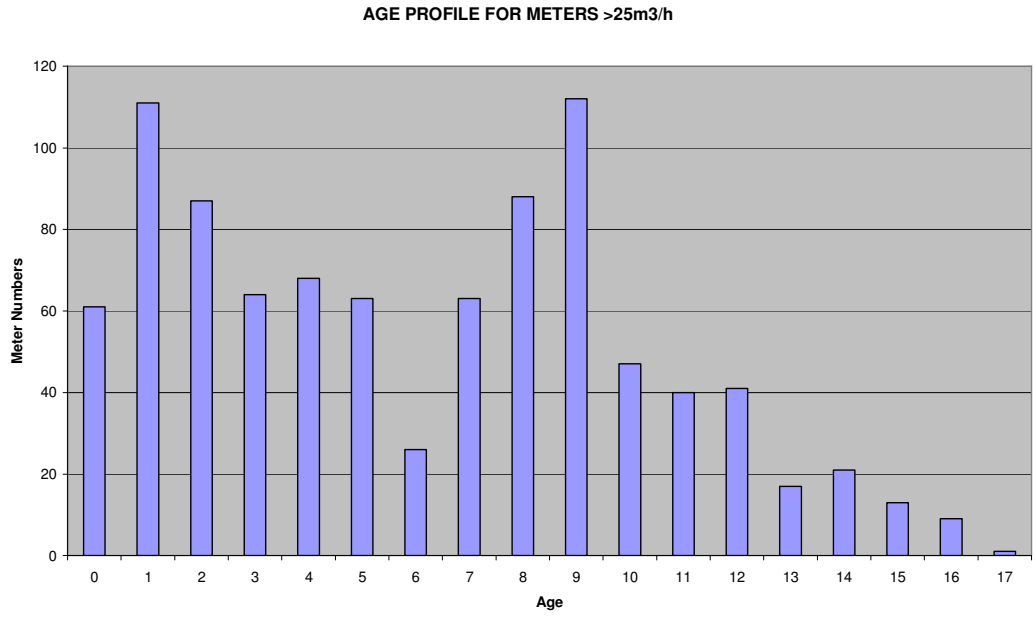
The age profiles of existing meters are shown on graphs below:



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Actual quantities and costs

In first two and half years of the 2006-11 AA period there was a single cost centre for meter replacement, testing and refurbishment. In the second half of 2008/09 separate cost centres for domestic meters and industrial and commercial meters were established. Actual quantity and cost is shown below:

	2007/08	2008/09	2009/10
PMC – Domestic - Numbers	942	1,184	1,574
PMC – I&C - Numbers	26	135	250
PMC – Domestic – Total cost ($/year)	180,000	230,359	313,468
PMC – I&C – Total cost ($/year)	82,426	714,758	518,552
PMC – Domestic – Average cost ($/ea)	191	195	199
PMC – I&C – Average cost ($/ea)	3,170	5,295	2,074

Most work on meter changes is completed by the contractor selected on Energex tendering process in 2006. In the same year, the same contractor won an Origin tender for meter change work on Envestra Queensland Networks. In 2009 this work was tendered by APT Allgas for both APT Allgas and Envestra Queensland Networks. A single contractor won both tenders with exactly same schedule of rates.

APT Allgas organises an annual tender for material supply to obtain the best market price.

Historically the domestic meter change was simply change of meter. Now we are obliged to change the meter, perform regulator checks (lockup and running) and then complete a pressure test of the installation. There is increase of unit costs related to these safety checks.

IDENTIFICATION OF NEED

The Queensland Petroleum and Gas (Production and Safety) Act 2004, Section 636, specifies obligations of controller of meter to develop, to maintain and implement Meter Measurement Scheme with specific requirements for meter change for testing. This is necessary to be able to check meter accuracy and its compliance with tolerance requirements specified in Queensland Petroleum and Gas (Production and Safety) Regulation 2004, Section 128.

RISK ASSESSMENT

The major risk is related to non compliance with statutory requirements related to meter changes and testing of their accuracy. Non-compliance with this requirement can result in additional conditions beijng imposed on the distribution licence, and significant financial penalties. As a result of that there will be and potential adverse comments in state media with widespread concerns from investors, customers and regulators.

There is additional financial risk is related to potential unidentified faulty meter related in loss of revenue and increased cost of unaccounted for gas.

There are also risks related to potential unidentified gas leaks or unsafe metering installation that can result in injuries.

The attached Risk Mitigation Form shows the current risk assessment and estimated risk levels for all alternative risk mitigation options.

EVALUATION OF ALTERNATIVES

Option 1

Continue the process of maintaining and implementing current Meter Measurement Scheme in accordance with the Queensland Petroleum and Gas (Production and Safety) Act and Regulations, and requirements for the timely sampling, testing, and assessment of in-service compliance of populations of diaphragm gas meters with maximum flow rate of up to and including 25m3/h used for fiscal measurement specified in AS/NZS4944 Gas meters – In-service compliance testing. For field work use only contractors are selected using standard APT Allgas services tendering process.

The advantage of this option is that contractors' rates may be lower than direct labour rates but require much more supervision including management of additional charges like "no access" charges.

Option 2

Complete above work using preferably direct labour.

Advantage of this option is that this work can be used as a fill-in job to optimise existing resources without problems related to "no access" to site. Unit rates are higher and additional works management is required. The benefits are reduction of overall network operation costs related to maximising use of internal resources.

Option 3 (Recommended option)

Complete above work using combination of direct labour and contractors (approximately 10% of work to be completed by direct labour and 90% by contractors). This option can use benefits of both previous options to maximise overall performance.

It is recommended to accept Option 3 and use combination of contractor resources (~90%) and internal resources (~10%) for change of domestic meters and internal resources to change industrial and commercial meters.

The proposed option will be the most cost effective option based on additional savings related to better utilisation of available internal resources.

ESTIMATED COST

Unit cost

The unit cost for change of a domestic meter set if work is performed by a contractor based on current schedule of rates and current material costs is as follows:

- Cost for meter and additional material $ 85/ea
- Contractors charges to change meter and regulator $ 48/ea
- Additional contractors charges ("no access") $ 19/ea
- Direct labour (issuing work, supervision, testing) $ 15/ea
- Overheads $ 42/ea
- **Total** **$209/ea**

If the same work is completed by direct labour estimated cost will be:

- Cost for meter and additional material $ 85/ea
- Direct labour - change meter, testing, works management $ 89/ea
- Overheads $ 43/ea
- **Total** **$217/ea**

For the industrial and commercial meter change program, average historical costs are used. This is done because of the large differences in material and labour costs related to metering station size and complexity. This work is mostly completed by direct labour.

The average cost to change meters for industrial and commercial customers is:

- Cost for meter and additional material $1,232/ea
- Contractors $ 108/ea
- Direct labour $ 303/ea
- Overheads $ 434/ea
- **Total** **$2,076/ea**

Planned future capital expenditure

Currently APT Allgas has approximately 78,500 domestic meters with over 3,000 new meters installed each year. All meters are on the FLE program and do not have fixed life cycle. If we assume that majority of domestic meters will have average life of 15 years, it will be necessary to conduct approximately 5,200 meter changes per year.

There are total of 2,500 industrial and commercial meters larger than standard domestic meter on the APT Allgas network. A total of 1,066 meters have a fixed 10 year life, with the balance in the FLE plan.

Forecast quantities and related cost for PMC are shown on table below.

PMC Program	10/11	11/12	12/13	13/14	14/15	15/16
Domestic meters numbers	2,000	1,962	1,686	3,231	5,200	2,536
Domestic meters cost ($ nominal)	424,797	429,587	386,992	761,435	1,281,302	648,297
Industrial and commercial meters numbers	192	221	167	162	226	312
Industrial and commercial meters cost ($nominal)	434,446	473,058	374,741	373,234	544,410	779,738

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Total cost ($ nominal)	**859,243**	**902,644**	**761,733**	**1,134,669**	**1,825,712**	**1,428,035**

PLAN FOR EFFECTIVE EXECUTION

The basic requirement for conforming capital expenditure specified in Rule 79(1) is that the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

APT Allgas has outsourced its capital works program (material and labour) through a public tender process, thereby obtaining a market price with respect to the provision of these services.

There is a plan to continue to test market in regular intervals to ensure that the proposed project will be executed at the lowest sustainable cost. Competitive tendering for supply of materials is planned to be organised annually and for provision of capital works services in 2 to 3 years intervals.

JUSTIFICATION

This proposal is in accordance with requirements for conforming capital expenditure specified in Rule 79 with justification as follows:

- This capital expenditure is necessary to be able to comply with a regulatory obligations for control of meters and to change meters as per requirements of Petroleum and Gas (Production and Safety) Act 2004, Section 626(b), and by that means, to maintain metering accuracy;

- This capital expenditure is necessary to improve the safety of services by removing leaking meters;

- This capital expenditure is necessary to maintain integrity of services by removing faulty meters.

ATTACHMENTS

1. Risk mitigation

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APT Allgas Energy Pty Limited
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Australian Pipeline Ltd
ACN 091 344 704

Australian Pipeline Trust
ARSN 091 678 778

APT Investment Trust
ARSN 115 585 441

Submission Form

Risk Mitigation

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Asset Details

State	Queensland	Asset Manager	xxx
Owner	APA Group	Approving Manager	xxx
Asset	Natural Gas Distribution Network		
CAPEX A/C no	xxxxx		

CURRENT UNTREATED RISK

Project Title	Meters Change Program
Description	There is requirement in Petroleum and Gas (Production and Safety) Act 2004, Section 636, for controller of meter to complete meter change for testing in accordance with
Risk Description	Non compliance with regulatory requirements, related financial penalties and potential under billing of DUOS related to slow or faulty meters

	Consequences							
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Budget Priority
Severity	Moderate	Minor	Minor	No risk	Severe	Moderate		
	Multiple - no permanent injury	Less than $1m Change to Project Budget	Short term localised service interruptions to less than 100 customers / day Parameters not met to 1 contract customer	No risk	Non-compliance with statutory, licence, regulations Now conditions to Licence manageable	Adverse comments in local media Public statement required		
Likelihood	Possible	Likely	Possible	None	Likely	Likely		
	Might occur at some time At least once every 10 years	Will occur in most circumstances At least once every 3 years	Might occur at some time At least once every 10 years	None	Will occur in most circumstances At least once every 3 years	Will occur in most circumstances At least once every 3 years		
Risk Score	8	7	4	-	17	12	48	Priority 2

PROPOSED RISK TREATMENTS

Option 1

Implement meter change and testing program as per Meter Measurement Scheme using predominantly contractors

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	Minor	Minor	Minor	No risk	Minor	Minor				
	Single - no permanent injury Loss time injury	Less than $1m Change to Project Budget	Short term localised service interruptions to less than 100 customers / day Parameters not met to 1 contract customer	No risk	Technical non-compliance with statutory, licence, regulations Voluntary explanation to Regulator	Isolated localised public complaints				
Likelihood	Unlikely	Unlikely	Unlikely	None	Unlikely	Unlikely		6,468,742	0	170,230
	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years	None	Could occur at some time At least once every 25 years	Could occur at some time At least once every 25 years				
Risk Score	2	2	2	-	2	2	10			

Option 2

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	Minor	Minor	Minor	No risk	Minor	Minor				
	Single - no permanent injury Loss time injury	Less than $1m Change to Project Budget	Short term localised service interruptions to less than 100 customers / day Parameters not met to 1 contract customer	No risk	Technical non-compliance with statutory, licence, regulations Voluntary explanation to Regulator	Isolated localised public complaints				
Likelihood	None	None	None	None	None	None			0	-
	None	None	None	None	None	None				
Risk Score	-	-	-	-	-	-	-			

Option 3

	Consequences									
	Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total Risk Score	Project Budget +/-30%	Ongoing annual costs	SIB Cost per Risk Reduction Score over 10 years
Severity	Minor	Minor	Minor	No risk	Minor	Minor				
	Single - no permanent injury Loss time injury	Less than $1m Change to Project Budget	Short term localised service interruptions to less than 100 customers / day Parameters not met to 1 contract customer	No risk	Technical non-compliance with statutory, licence, regulations Voluntary explanation to Regulator	Isolated localised public complaints				
Likelihood	None	None	None	None	None	None			0	-
	None	None	None	None	None	None				
Risk Score	-	-	-	-	-	-	-			

APT Allgas Energy Pty Limited

Opex Business Case
IT Infrastructure Upgrades & Renewals
Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100908 Opex Business Case - IT Infrastructure Upgrades & Renewals.doc

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1.1 IT Infrastructure Upgrades

1.1.1 Project Overview

This project is required to support the periodic upgrade of APT Allgas IT Infrastructure (i.e. upgrades and renewals) and the standardised use of Virtualisation, Storage Area Network and Server Blade technologies over the Access Arrangement period.

The scope of work includes:

- The standardised use of Virtualisation, Storage Area Network and Server Blade technologies; and
- Upgrades / renewals to the GIS server.

1.1.2 Background

Many of APT Allgas' applications are hosted on Windows servers. These servers have been purchased with a warranty that covers support for three years.1 Server pricing was obtained for both three years and five years of support.2 The difference between keeping a server for five years rather than three years is between approximately 12 per cent and 20 per cent of the cost of a replacement server. On this basis, the practice has been to obtain five years support given that the cost of continuing support into the fifth year of the server's life would almost cover the base price for a new server.

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. APT Allgas' policy is to have a planned replacement of servers as they come out-of-warranty.

Underpinning this policy is APT Allgas' need to provide appropriate service levels for infrastructure reliability and availability to support APT Allgas' applications and business processes. The purchase of an appropriate warranty enables APT Allgas to provide this. Once hardware is out of warranty APT Allgas has no control over the

[1] At the time of purchase of the existing servers, the policy was to obtain a three years warranty up front. However, to meet APT Allgas' service level agreement (SLA) requirements all servers must be under existing warrantee. Purchasing an additional warrantee after three years is very costly and is not economic. Once a server is out of warrantee the required SLA requirements cannot be met. The current policy is therefore to purchase a five year warrantee as part of the server purchase.

[2] A warranty period of five years is the maximum available from vendors with a five years lifetime being the limit for IT equipment of this nature.

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: and the changes in technology since the last time the servers were purchased to take account of the latest APT Allgas capabilities; and the ability to consolidate servers and reduce overhead costs where possible.

The following technologies were included in the review:

- Virtualisation: Virtualisation of servers provides a significant advancement in the ability for IT to provide and manage environments, reducing the total cost of ownership. Virtualisation transforms the management of IT infrastructure by allowing servers to become dynamic and software files to be provisioned, managed, secured and protected with greater speed and efficiency by using an on-demand pool of infrastructure resources. Applications can be delivered seamlessly with the highest level of availability and service levels and without the cost and complexity of traditional IT solutions;

- Storage Area Network (SAN): Devices provide disk storage resources to a number of servers, rather than each server having its own separate disk. In addition to its use with virtualisation, this helps to provide fast, robust, flexible storage facilities and maximise utilisation of disk space; and

- Server Blades: Use of server blade technologies, sitting in a blade chassis, helps to minimise resources such as cost, space and power. This makes them more environmentally friendly than equivalent rack servers. These technologies have been successfully implemented to provide the infrastructure platform to run APT Allgas applications on. They are accepted as good practise by all major vendors e.g. IBM, Hewitt Packard and Dell. In addition, many Gartner Clients are standardising on this technology.[3,4]

The results of the review were to standardise the use of Virtualisation, SAN and Server Blade technologies where they can be supported. At the time of the decision a “Like for Like” option (not utilising the new technologies) was costed, which showed an approximate $80K additional cost over five years. Following the review, through the adoption of Virtualisation, the number of physical servers has been reduced by 30.

[3] Refer to the Gartner Magic Quadrant report on Blade Servers, October 2009.

[4] The IDC White Paper, “Forecasting Total Cost of Ownership for Initial Deployments of Server Blades”, provides analysis of the expected cost savings of blade server systems over rack-optimised server systems.

Not all of APT Allgas' applications will support these new technologies. As such, there is a need to continue one for one server replacement at the end of the warranty period. This applies to the Geographic Information System (GIS) in Queensland.

A stay in business program of work for APT Allgas' IT infrastructure upgrades and renewals has been established for the five year span of the next Access Arrangement period. This is in-line with the five year warrantee provided by vendors.

1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- Many of APT Allgas' applications are hosted on Windows servers. These servers have been purchased with a warranty that covers support for three years;
- Once the warranty expires on a server the risk of hardware failure increases due to age, particularly for infrastructure with 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;
- A review has been undertaken of APT Allgas' IT infrastructure requirements. The outcome of the review was to:
  - Standardise the use of Virtualisation and SAN and Server Blade technologies, where they can be supported; and
  - Continue one for one server replacement at the end of the warranty period where the above technologies are not supported. This applies to the GIS in Queensland;
- A stay in business program of work for APT Allgas' IT infrastructure upgrades and renewals has been established for the 5 year span of the Access Arrangement period to ensure the:
  - Continuation of IT vendor support;
  - Security and integrity of business information;
  - Stability of IT systems; and
  - Compliance of IT systems;
- In the event of the IT application upgrades not being implemented:
  - Cessation of Vendor support;

- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure resulting in unplanned production outages;
- Major failure resulting in non compliance with Retail Market Procedures; and

o Work is to be undertaken by qualified contractors, sourced from trusted recruitment agencies based on specified requirements of skills and experience, supervised by internal personnel.

1.1.4 Costs & Timing

All costs are expressed in $2009/10 real.

The project cost estimates are based on managing APT Allgas' obligations under the Retail Market Procedures.

APT Allgas utilises a combination of internal and external resources (through vendors and quotations from trusted recruitment agencies) to ensure that services are carried out in a cost effective manner.

Actual material and direct labour costs, and applicable planning, design and commissioning charges, are based on historic actual costs of similar projects. External resource unit costs are based on the median rate as supplied by recruitment agency Peoplebank from actual placements Peoplebank makes within the Utility sector, plus information from their half yearly salary survey.

Table **Error! No text of specified style in document.**-1 and Table **Error! No text of specified style in document.**-2 provide a breakdown, by activity and by type respectively, of the forecast costs of the required projects for the period 1 July 2011 to 30 June 2016. A cost breakdown and a detailed component cost breakdown have been provided in Attachment A and Attachment C, respectively.

*Table **Error! No text of specified style in document.**-1: IT Infrastructure Upgrades and Renewals Expenditure by Activity*

$K (Real 2009/10)						
	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
SERVER REP - GIS	-	80		-	-	**80**
SERVER REP – NEW TECHNOLOGY	-	-	162	-	-	**162**
SERVER SERVICE PACKS	10	10	10	10	10	**50**
Total	10	90	172	10	10	292

*Table **Error! No text of specified style in document.**-2: IT Infrastructure Upgrades and Renewals Expenditure by Type*

$K (Real 2009/10)						
	2011 -12	**2012 -13**	**2013 -14**	**2014 -15**	**2015 -16**	**Total**
Materials (System Complete)	10	90	172	10	10	**292**
Direct Labour	-	-	-	-	-	**-**
Contractors	-	-	-	-	-	**-**
Planning, Design and Commissioning	-	-	-	-	-	**-**
Total	10	90	172	10	10	292

1.1.5 Options Considered

Three main options were considered to address the risks of not implementing the required IT infrastructure upgrades and renewals, being:

- Standardise use of Virtualisation, SAN and Server Blade and replace the GIS server;
- Reduced scope; and
- Do nothing.

Each of these options is discussed in turn below.

Option 1: Standardise use of Virtualisation, SAN and Server Blade technologies and replace GIS server

Cost estimate: $292K

Option 1 involves upgrades or renewals to:

- Virtualisation, SAN and Server Blade technologies; and
- GIS Server in Queensland.

Option 2: Reduced scope

Cost estimate: less than $292K

Option 2 involves reducing the scope of the IT infrastructure upgrades and renewals identified in option 1. This may involve not standardising on the use of

Virtualisation and SAN and Server Blade technologies and/or not undertaking certain upgrades or renewals to IT infrastructure.

Option 3: Do nothing

Option 3 involves undertaking no upgrades or renewals to IT infrastructure.

Cost Benefit Analysis

An assessment of the advantages and disadvantages of each option has been undertaken on the options to address the identified IT infrastructure upgrades and renewals. As a result:

- Option 1 is considered to be the best solution as it is the only option to address the risks associated with the failure to implement the required IT infrastructure upgrades and renewals. The standardised use of virtualisation will further reduce the risks associated with traditional IT infrastructure due to its ability to avoid APT Allgas' capacity constraints by pooling and dynamically allocating resources. The adoption of Virtualisation has already resulted in the number of physical servers being reduced. The standardised use of Server Blade technology has cost advantages over rack-optimised server systems, as highlighted in the IDC White Paper, "Forecasting Total Cost of Ownership for Initial Deployments of Server Blades"; and

- Option 2 is not considered a prudent as the failure to standardise on Virtualisation and SAN and Server Blade technologies will result in reduced cost advantages5 and diminished risk reduction. Failure to undertake upgrades or renewals to IT infrastructure will result in failure to meet regulatory obligations and requirements. In general, option 2 may expose APT Allgas to:

  - A reduction in availability of services;
  - A reduction in integrity of services; and
  - An inability to comply with regulatory obligations or requirements.

The residual risk will continue to be high under this option.

- Option 3 is not considered acceptable as it may also expose APT Allgas to:

  - A reduction in availability of services;
  - A reduction in integrity of services; and

[5] Note that a "Like for Like" option (not utilising the new technologies) was costed at the time of the decision to standardise on Virtualisation and SAN and Server Blade technologies, which showed an approximate $80,000 additional cost over five years.

- An inability to comply with regulatory obligations or requirements.

The risk of not implementing the identified IT infrastructure upgrades and renewals has been determined as extreme for compliance and legal with a high risk of an adverse financial, customer, business and reputation impact as determined by the risk mitigation analysis detailed in Attachment B.

Option 1 is the required option as it:

- Is the only option to address the risks associated with the failure to implement the identified IT infrastructure upgrades and renewals;
- Achieves a significant level of risk reduction as determined by the risk mitigation analysis detailed in Attachment B;
- Allows APT Allgas to:
  - Maintain the existing availability of services;
  - Maintain integrity of services; and
  - Comply with regulatory obligations or requirements.

Table **Error! No text of specified style in document.**-1and Table **Error! No text of specified style in document.**-2 provide a breakdown, by activity and by type respectively, of the forecast costs of the recommended project for the period 1 June 2011 to 30 July 2016.

A detailed breakdown of the costs associated with the upgrade of each of the critical business IT applications identified in option 1 is provided in Attachment A.

Capex / Opex Tradeoff

Substitution between capital and operating expenditure is not a feasible option.

1.1.6 Risk Assessment

The risk assessment has been undertaken which analysed and identified current and potential future network operational risks (and residual risks) in terms of the consequences and the likelihood of the risk. This is carried out using APT Allgas' established evaluation criteria to produce an estimated level of risk and to rank and prioritise the risk based on APT Allgas' established risk management and control criteria.

Risk mitigation analysis has been carried out that shows that if the IT infrastructure upgrades and renewals are not implemented there is a risk of:

- Cessation of vendor support;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure resulting in unplanned production outages; and
- Major failure resulting in non compliance with retail market procedures.

The risk associated with the failure to implement the required IT infrastructure upgrades and renewals has been assessed as "High" and has been assigned Priority 2.

The risk assessment is detailed below.

		Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total
Risk	**Likelihood**	*Rare*	*Possible*	*Possible*	*Rare*	*Possible*	*Possible*	
	Consequence	*Minor*	*Severe*	*Moderate*	*Minor*	*Moderate*	*Minor*	
	Risk Level	*Low* 01	*High* 13	*Moderate* 08	*Low* 01	*Moderate* 08	*Low* 04	*35*
Option 1 Residual Risk	**Likelihood**	*Rare*	*Unlikely*	*Unlikely*	*Rare*	*Unlikely*	*Unlikely*	
	Consequence	*Minor*	*Minor*	*Minor*	*Minor*	*Minor*	*Minor*	
	Risk Level	*Low* 01	*Low* 02	*Low* 02	*Low* 01	*Low* 02	*Low* 02	*10*

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 APT Allgas.
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 APT Allgas, 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.

1.1.7 Justification

Consistent with the requirements of Rule 79(1)(a), APT Allgas considers that the capital expenditure that it is seeking in order to address the identified IT infrastructure upgrades and renewals would be:

- Prudent – the expenditure is necessary in order to maintain the integrity of services by ensuring:
  - Continuation of IT vendor support;
  - Security and integrity of business information;
  - Stability of IT systems; and
  - Compliance of IT systems.

A stay in business program of work for APT Allgas' IT infrastructure upgrades and renewals has been established for the five year span of the next Access Arrangement period. If the IT application upgrades are not implemented there is a risk of:

- Cessation of vendor support;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure resulting in unplanned production outages; and
- Major failure resulting in non compliance with retail market procedures.

- Efficient – APT Allgas has considered a number of options and undertaken a cost benefit analysis, where the project was selected on the basis of:
  - Being the only option to address the risks associated with the failure to implement the required IT infrastructure upgrades and renewals;
  - Achieving a significant level of risk reduction as determined by the risk mitigation analysis detailed in Attachment B;
  - Allowing APT Allgas to:
    - Maintain the existing availability of services;
    - Maintain integrity of services; and
    - Comply with regulatory obligations or requirements.

In addition, APT Allgas utilises a combination of internal and external resources (through vendors and quotes from trusted recruitment agencies) to ensure that services are carried out in a cost effective manner. The actual material and direct labour costs, and applicable planning, design and commissioning charges, are based on historic actual costs of similar projects. External resource unit costs are based on the median rate as supplied by trusted recruitment agencies.

For these reasons, the capital expenditure is considered efficient;

- Consistent with accepted and good industry practice – implementing the required IT infrastructure upgrades and renewals has been determined through risk analysis to be necessary on the basis that there is an extreme risk of non-compliance with regulatory obligations or requirements and a high risk of adverse financial, customer, business and reputation impacts as determined by the risk mitigation analysis detailed in Attachment B. The recommended projects will address this issue through the standardisation of Virtualisation and SAN and Server Blade technologies and the one for one replacement of the GIS servers. The recommended project has been assessed against alternative options and is the only option to address the risks associated with the failure to implement IT infrastructure upgrades and renewals. On this basis, the capital expenditure is consistent with accepted and good industry practice; and

- Necessary to achieve the lowest sustainable cost of delivering pipeline services – the IT Application Upgrades and Renewals projects are necessary to maintain the integrity of services by ensuring:
  - Continuation of IT vendor support;
  - Security and integrity of business information;
  - Stability of IT systems; and

- Compliance of IT systems.

The need to implement IT infrastructure upgrades and renewals has been identified, based on a review that was undertaken on IT infrastructure requirements. The review assessed the changes in technology since the existing servers were purchased to take into account the latest APT Allgas capabilities and the ability to consolidate servers and reduce overhead costs where possible. Additionally, risk mitigation analysis shows that there is an extreme risk of non-compliance with regulatory obligations or requirements and a high risk of adverse financial, customer, business and reputation impacts. The capital expenditure that APT Allgas requires is the only option assessed that fully addresses the identified risks. Additionally, APT Allgas utilises a combination of internal and external resources (through vendors and quotes from trusted recruitment agencies) to ensure that services are carried out in a cost effective manner. The actual material and direct labour costs, and applicable planning, design and commissioning charges, are based on historic actual costs of similar projects. External resource unit costs are based on the median rate as supplied by trusted recruitment agencies. On this basis, the additional expenditure is necessary to achieve the lowest sustainable cost of delivering the reference service.

In response to Rule 79(1)(b), APT Allgas considers that the capital expenditure is justifiable under Rule 79(2)(c)(ii) as the expenditure is necessary in order to maintain the integrity of services.

The recommended projects will address the risks associated with the failure to implement the identified IT infrastructure upgrades and renewals, being:

- Cessation of Vendor support;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure resulting in unplanned production outages; and
- Major failure resulting in non compliance with market rules.

The risk associated with the failure to implement the identified IT infrastructure upgrades and renewals has been assessed as "Extreme" and has been assigned Priority 1.

1.1.8 Step Change Not in Base Year Costs

APT Allgas confirms that the additional in operating expenditure associated with the Road Map Initiative Project in its Queensland distribution network is not included in the base year costs for 2009/10.

1.1.9 Project Delivery

APT Allgas confirms that it will use a combination of internal and external resources to deliver the recommended project. Work is to be undertaken by qualified contractors, sourced from trusted recruitment agencies based on specified requirements of skills and experience, supervised by internal personnel.

1.1.10 Consequences of Not Proceeding

If this project is not undertaken, then APT Allgas will:

- Be exposed to an extreme risk of non-compliance with regulatory obligations or requirements and a high risk of adverse financial, customer, business and reputation impacts.

The result of failure to upgrade critical IT applications may include:

- Cessation of Vendor support;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure resulting in unplanned production outages; and
- Major failure resulting in non compliance with retail market procedures.

ATTACHMENT A – IT INFRASTRUCTURE UPGRADES AND RENEWALS COST ESTIMATE

Infrastructure Upgrades and Renewals APT Allgas QLD

Cost Estimate 2011/16

Capital Expenditure Estimate

Description	Cost
Resources	0
Infrastructure	292000
Total	**292000**

Description	Number to Upgrade	Unit Cost ($)	Cost ($)
Server Replacement GIS			
2011/12	4	20,000	80,000
Server Replacement New Technology Blade Chassis, Blades, and SAN			
2013/14 Major Replacement of Blade infrastructure (split between 4 managed networks)	1	162,000	162,000
Service Packs 1 set per year	5	10,000	50,000
Total Resource Estimate			**292,000**

Description	Number to Upgrade	Unit Cost ($)	Cost ($)
Service Packs 1 set per year	5	10,000	50,000
Total Resource Estimate			**292,000**

APT Allgas Energy Pty Limited

Opex Business Case
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Effective
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1.1 Qld Networks IT Applications

1.1.1 Project Overview

This project is to support the periodic upgrade of APT Allgas' information technology (IT) applications over the period 1 June 2011 to 30 July 2016 for a forecast cost of $360K.This involves upgrades to the following IT applications:

- Maximo – Full Retail Contestability (FRC), Works management – installed 2007;
- Control M – FRC, Batch processing – last upgrade 2004;
- WebMethods Fabric – FRC Middleware – last upgrade 2007;
- WebMethods – FRC Gateway – last upgrade 2006; and
- RedBox – FRC Metering and Billing – installed 2006.

The expenditure is necessary to satisfy Retail Market Procedures (Queensland)1, in particular AEMO document number 291994 (see sections 3.1 and 5.1) and APT Allgas' business requirements.

1.1.2 Background

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

- Full retail contestability and works management (Maximo);
- Reporting (Actuate);
- Full retail contestability batch processing (Control M) (GIS);
- Full retail contestability middleware and gateway (WebMethods Fabric and gateway); and
- Full retail contestability metering and billing (Redbox).

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 (Queensland)2 and APT Allgas' business requirements.

[1] AEMO, Retail Market Procedures – Queensland (Sydney, October 2009)

Significant IT investment has been made in recent years to ensure that APT Allgas' systems meet its obligations as set out in the Retail Market Procedures. APT Allgas needs to ensure this investment is managed and maintained.

Application vendors will only provide support for certain versions of their applications, typically 'n-1', where 'n' is the current version of the application. Running applications older than this will risk:

- Core applications no longer being supported by IT vendors;
- IT applications becoming increasingly unstable;
- Being unable to address strategic imperatives and architectural weaknesses;
- An increased rate of failure in older IT applications, resulting in unplanned production outages; and
- Catastrophic failure resulting in non compliance of Retail Market Procedures.

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 and is required to ensure:

- Continuation of IT vendor support;
- Security and integrity of business information;
- Stability of IT systems; and
- Compliance of IT systems.

1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- Critical IT applications are linked together and are reliant on each other to allow high volumes of transactions to flow from one to the other;
- It is necessary to ensure the full functionality of these linked critical IT applications to satisfy retail market rules and APT Allgas' business requirements;

[2] The Retail Market Procedures (Queensland), AEMO document number 291994, (see sections 3.1 and 5.1) deals with APT Allgas' obligations with regard to meter reading, meter management, and maintaining a meter database.

- Significant IT investment has been made in recent years to ensure that APT Allgas' systems meet their obligations as set out in the retail market rules. APT Allgas 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 and is required to ensure:
  - Continuation of IT vendor support;
  - Security and integrity of business information;
  - Stability of IT systems; and
  - Compliance of IT systems;
- In the event of the IT application upgrades not being implemented:
  - Core applications may no longer supported by IT vendors;
  - IT applications become increasingly unstable;
  - APT Allgas may be unable to address strategic imperatives and architectural weaknesses;
  - The rate of failure in older IT applications may increase, resulting in unplanned production outages;
  - Catastrophic failure may occur, resulting in non compliance of Retail Market Procedures; and
- Work is to be undertaken by qualified contractors, sourced from trusted recruitment agencies based on specified requirements of skills and experience, supervised by internal personnel.

1.1.4 Costs & Timing

The project cost estimates are based on managing APT Allgas' obligations under the Retail Market Procedures.

APT Allgas utilises a combination of internal and external resources (through vendors and quotes from trusted recruitment agencies) to ensure that services are carried out in a cost effective manner.

The Maximo (full retail contestability and works management) upgrade costs are one third of APT Allgas' national costs for providing the applications to each

jurisdiction. The other applications are separate installations applicable to APT Allgas' Queensland network.

Table **Error! No text of specified style in document.**-1 below provides a breakdown of the forecast costs of the recommended project for the period 1 June 2011 to 30 July 2016. A detailed breakdown of the costs associated with the upgrade of each of the critical business IT applications identified in is provided in Attachment A.

*Table **Error! No text of specified style in document.**-1: IT Applications Upgrades and Renewals Expenditure by Activity*

$K (Real 2009/10)

	2011 -12	***2012 -13***	***2013 -14***	***2014 -15***	***2015 -16***	***Total***
CONTROL M U/G	*30*	*-*	*-*	*30*	*-*	***60***
MAXIMO U/G	*-*	*-*	*120*	*-*	*-*	***120***
REDBOX	*-*	*-*	*40*	*-*	*-*	***40***
WEBMETHODS FABRIC U/G	*-*	*-*	*40*	*-*	*-*	***40***
WEBMETHODS GATEWAY U/G	*-*	*30*	*-*	*-*	*30*	***60***
Total	*30*	*30*	*200*	*30*	*30*	*320*

1.1.5 Options Considered

Three main options were considered to address the periodic upgrades to critical business IT applications, being:

- Upgrade five critical IT applications;
- Reduced scope; and
- Do nothing.

Each of these options is discussed in turn below.

Option 1: Upgrade five critical IT applications

Cost estimate: $320K

Option 1 involves upgrades to:

- Maximo – Full Retail Contestability (FRC), Works management – installed 2007;

- Control M – FRC, Batch processing – last upgrade 2004;
- WebMethods Fabric – FRC Middleware – last upgrade 2007;
- WebMethods – FRC Gateway – last upgrade 2006; and
- RedBox – FRC Metering and Billing – installed 2006.

The above are considered to be minor application upgrades, as provided by the application vendors, while major upgrades are considered in relation to APT Allgas' Strategic Plan and its Road Map Initiatives, which support the business strategic direction and address existing architectural weaknesses that restrain business performance.

Option 2: Reduced scope

Cost estimate: less than $320K

Option 2 involves reducing the scope of the upgrades to the IT applications identified in option 1 by delaying the upgrade of some applications and/or not upgrading some applications at all.

Any decision on delaying an application upgrade would need to assess the criticality of the application to the business.

Option 3: Do nothing

Option 3 involves undertaking no upgrades to IT applications.

Cost Benefit Analysis

An assessment of the advantages and disadvantages has been undertaken on each of the options. As a result:

- Option 1 is considered to be the best solution as it is the only option to address the risks associated with the failure to upgrade critical business IT applications.
- Option 2 is not considered to be a prudent solution as it may expose APT Allgas to:
  - A reduction in availability of services;
  - A reduction in integrity of services; and
  - An inability to comply with regulatory obligations or requirements.

The residual risk will continue to be high under this option.

- Option 3 is not considered acceptable as it may also expose APT Allgas to:
  - A reduction in availability of services;
  - A reduction in integrity of services; and
  - An inability to comply with regulatory obligations or requirements.

The risk of not upgrading the critical business IT applications has been determined as extreme for compliance and legal with a high risk of an adverse financial, customer, business and reputation impact as determined by the risk mitigation analysis detailed in Attachment B.

Option 1 is the required option as it:

- Is the only option to address the risks associated with the failure to upgrade critical business IT applications;
- Achieves a significant level of risk reduction as determined by the risk mitigation analysis detailed in Attachment B;
- Allows APT Allgas to:
  - Maintain the existing availability of services;
  - Maintain integrity of services; and
  - Comply with regulatory obligations or requirements.

A detailed breakdown of the costs associated with the upgrade of each of the critical business IT applications identified in option 1 is provided in Attachment A.

Capex / Opex Tradeoff

Substitution of capital expenditure for operating expenditure is not an option.

1.1.6 Risk Assessment

The risk assessment has been undertaken which analysed and identified current and potential future network operational risks (and residual risks) in terms of the consequences and the likelihood of the risk. This is carried out using APT Allgas' established evaluation criteria to produce an estimated level of risk and to rank and prioritise the risk based on APT Allgas' established risk management and control criteria.

Risk mitigation analysis has been carried out that shows that if the IT application upgrades are not implemented there is a risk of:

- Core applications no longer being supported by IT vendors;
- IT applications becoming increasingly unstable;
- Being unable to address strategic imperatives and architectural weaknesses;
- An increased rate of failure in older IT applications, resulting in unplanned production outages; and
- Catastrophic failure resulting in non compliance of retail market rules.

The risk associated with the failure to upgrade critical IT applications has been assessed as "High" and has been assigned Priority 2.

The risk assessment is detailed below.

		Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total
Risk	**Likelihood**	*rare*	*Possible*	*Possible*	*rare*	*Possible*	*Possible*	
	Consequence	*Minor*	*Severe*	*Moderate*	*Minor*	*Moderate*	*Minor*	
	Risk Level	*Low* 01	*High* 13	*Moderate* 08	*Low* 01	*Moderate* 08	*Low* 04	*35*
Option 1 Residual Risk	**Likelihood**	*Rare*	*Unlikely*	*Unlikely*	*Rare*	*Unlikely*	*Unlikely*	
	Consequence	*Minor*	*Minor*	*Minor*	*Minor*	*Minor*	*Minor*	
	Risk Level	*Low* 01	*Low* 02	*Low* 02	*Low* 01	*Low* 02	*Low* 02	*10*

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 APT Allgas.
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 APT Allgas, 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		Any project, where Risk Level of at least one risk area falls into Low must be

4		included in Priority 4. The non inclusion of these projects may affect opportunity for overall company risk reduction and operating efficiencies.

1.1.7 Justification

Consistent with the requirements of Rule 79(1)(a), APT Allgas considers that the capital expenditure that it is seeking in order to address the upgrades to critical business IT applications would be:

- Prudent – the expenditure is necessary in order to maintain the integrity of services by ensuring:
  - Continuation of IT vendor support;
  - Security and integrity of business information;
  - Stability of IT systems; and
  - Compliance of IT systems.

A stay in business program of work has been established to apply minor upgrades to critical business applications every three years. A three-year duration is in line with prudent industry practice. If the IT application upgrades are not implemented there is a risk of:

- Core applications no longer supported by IT vendors;
- IT applications becoming increasingly unstable;
- Being unable to address strategic imperatives and architectural weaknesses;
- An increased rate of failure in older IT applications, resulting in unplanned production outages; and
- Catastrophic failure resulting in non compliance of retail market rules.

- Efficient – An assessment of the advantages and disadvantages has been undertaken on each of the options, where the project was selected on the basis of:
  - Being the only option to address the risks associated with the failure to upgrade critical business IT applications;
  - Achieving a significant level of risk reduction as determined by the risk mitigation analysis detailed in Attachment B;
  - Allowing APT Allgas to:

- Maintain the existing availability of services;
- Maintain integrity of services; and
- Comply with regulatory obligations or requirements.

In addition, the material and direct labour costs, and applicable planning, design and commissioning charges, are based on historic actual costs of similar projects. Further, APT Allgas utilises a combination of internal and external resources (through vendors and quotes from trusted recruitment agencies) to ensure that services are carried out in a cost effective manner. External resource unit costs are based on the median rate as supplied by recruitment agency Peoplebank from actual placements Peoplebank makes within the Utility sector, plus information from their half yearly salary survey.

For these reasons, the capital expenditure is considered efficient;

- Consistent with accepted and good industry practice – upgrading critical business IT applications has been determined through risk analysis to be necessary on the basis that there is a high risk of : non-compliance with regulatory obligations or requirements; a risk of adverse financial, customer and business and reputation impacts as determined by the risk mitigation analysis detailed in Attachment B. Additionally, the practice of applying minor upgrades to critical business applications every three years is in line with good industry practice. The recommended project will address this issue through the upgrade of five key IT applications. The recommended project has been assessed against alternative options – and is the only option to address the risks associated with the failure to upgrade critical business IT applications. On this basis, the capital expenditure is consistent with accepted and good industry practice; and

- Necessary to achieve the lowest sustainable cost of delivering services – the IT Application Upgrades and Renewals project is necessary to maintain the integrity of services by ensuring:

  - Continuation of IT vendor support;
  - Security and integrity of business information;
  - Stability of IT systems; and
  - Compliance of IT systems.

The need to upgrade critical IT applications has been identified, based on available information, with risk mitigation analysis showing there is an extreme risk of non-compliance with regulatory obligations or requirements and a high risk of adverse financial, customer and business and reputation impacts. The capital expenditure that APT Allgas is seeking is the only option assessed that fully addresses the

identified risks. Additionally, the cost estimates for this project are based on historic actual costs of similar projects and a combination of internal and external resources (through vendors and quotes from trusted recruitment agencies) to ensure that services are carried out in a cost effective manner. External resource unit costs are based on the median rate as supplied by recruitment agency Peoplebank from actual placements Peoplebank makes within the Utility sector, plus information from their half yearly salary survey. On this basis, the additional expenditure is necessary to achieve the lowest sustainable cost of delivering the reference service.

In response to Rule 79(1)(b), APT Allgas considers that the capital expenditure is justifiable under Rule 79(2)(c)(ii) as the expenditure is necessary in order to maintain the integrity of services.

The required project will address the risks associated with failure to upgrade critical IT applications, being:

- Core applications no longer being supported by IT vendors;
- IT applications becoming increasingly unstable;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure in older IT applications, resulting in unplanned production outages; and
- Catastrophic failure resulting in non compliance of Retail Market Procedures.

The risk associated with the failure to upgrade critical IT applications has been assessed as "High" and has been assigned Priority 2.

The recommended project is consistent with APT Allgas' practice of applying minor upgrades to critical business applications every three years, which is in line with good industry practice.

1.1.8 Step Change Not in Base Year Costs

APT Allgas confirms that the additional in operating expenditure associated with the Road Map Initiative Project in its Queensland distribution network is not included in the base year costs for 2009/10.

1.1.9 Project Delivery

APT Allgas confirms that it will use a combination of internal and external resources to deliver the recommended project. Work is to be undertaken by qualified contractors, sourced from trusted recruitment agencies based on specified requirements of skills and experience, supervised by internal personnel.

1.1.10 Consequences of Not Proceeding

If this project is not undertaken, then APT Allgas will:

- Be exposed to an extreme risk of non-compliance with regulatory obligations or requirements and a high risk of adverse financial, customer and business and reputation impacts; and
- Need to divert expenditure from other necessary projects which will have a detrimental effect on APT Allgas' overall service delivery.

The result of failure to upgrade critical IT applications may include:

- Core applications no longer being supported by IT vendors;
- IT applications becoming increasingly unstable;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure in older IT applications, resulting in unplanned production outages; and
- Catastrophic failure resulting in non compliance of Retail Market Procedures.

ATTACHMENT A – IT APPLICATION UPGRADES AND RENEWALS DETAILED COST ESTIMATES

Control M Upgrade QLD

Cost Estimate 2011/16

Capital Expenditure Estimate

Description	Cost
Resources	60030
Infrastructure	0
Total	**60030**

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	2	1	1400	2800	420	3220
External - Technical	0	0	900	0	0	0
Internal	2	3	550	3300	495	3795
Design						
Vendor	2	1	1400	2800	420	3220
External - Technical	2	1	900	1800	270	2070
Internal	2	4	550	4400	660	5060
Testing						
Vendor	2	2	1400	5600	840	6440
External - Technical	2	1	900	1800	270	2070
Internal	2	6	550	6600	990	7590
Implementation & Warranty						
Vendor	2	2	1400	5600	840	6440
External - Technical	0	0	900	0	0	0
Internal	2	5	550	5500	825	6325
Project Management	2	6	1000	12000	1800	13800
Travel and Other Expenses						
Total Resource Estimate						**60030**

Maximo Upgrade QLD
Cost Estimate 2013/14

Capital Expenditure Estimate

Description	Cost
Resources	119,657
Infrastructure	0
Total	**119,657**

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	1	3	1,400	4,200	630	4,830
External - Technical	0	0	900	0	0	0
Internal	1	10	550	5500	825	6,325
Design						
Vendor	1	4	1,400	5,600	840	6,440
External - Technical	1	1	900	900	135	1,035
Internal	2	10	550	11,000	1,650	12,650
Testing						
Vendor	1	1	1,400	1,400	210	1,610
External - Technical	1	1	900	900	135	1,035
Internal	2	35	550	38,500	5,775	44,275
Implementation & Warranty						
Vendor	1	2	1,400	2,800	420	3,220
External - Technical	0	0	900	0	0	0
Internal	1	15	550	8,250	1,237	9,487
Project Management	1	25	1,000	25,000	3,750	28,750
Travel and Other Expenses						
Total Resource Estimate						**119,657**

Redbox Upgrade QLD
Cost Estimate 2013/14

Capital Expenditure Estimate

Description	Cost
Resources	39502
Infrastructure	0
Total	**39502**

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	1	1	1400	1400	210	1610
External - Technical	0	0	900	0	0	0
Internal	1	3	550	1650	247.5	1897.5
Design						
Vendor	1	2	1400	2800	420	3220
External - Technical	1	1	900	900	135	1035
Internal	1	5	550	2750	412.5	3162.5
Testing						
Vendor	1	2	1400	2800	420	3220
External - Technical	1	1	900	900	135	1035
Internal	2	6	550	6600	990	7590
Implementation & Warranty						
Vendor	1	2	1400	2800	420	3220
External - Technical	0	0	900	0	0	0
Internal	1	5	550	2750	412.5	3162
Project Management	1	9	1000	9000	1350	10350
Travel and Other Expenses						
Total Resource Estimate						**39502**

Web Methods Fabric Upgrade QLD
Cost Estimate 2013/14

Capital Expenditure Estimate

Description	Cost
Resources	39502
Infrastructure	0
Total	**39502**

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	1	1	1400	1400	210	1610
External - Technical	0	0	900	0	0	0
Internal	1	3	550	1650	247.5	1897.5
Design						
Vendor	1	2	1400	2800	420	3220
External - Technical	1	1	900	900	135	1035
Internal	1	5	550	2750	412.5	3162.5
Testing						
Vendor	1	2	1400	2800	420	3220
External - Technical	1	1	900	900	135	1035
Internal	2	6	550	6600	990	7590
Implementation & Warranty						
Vendor	1	2	1400	2800	420	3220
External - Technical	0	0	900	0	0	0
Internal	1	5	550	2750	412.5	3162
Project Management	1	9	1000	9000	1350	10350
Travel and Other Expenses						
Total Resource Estimate						**39502**

Web Methods Hub Upgrade QLD
Cost Estimate 2011/16

Capital Expenditure Estimate

Description	Cost
Resources	60030
Infrastructure	0
Total	**60030**

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	2	1	1400	2800	420	3220
External - Technical	0	0	900	0	0	0
Internal	2	3	550	3300	495	3795
Design						
Vendor	2	1	1400	2800	420	3220
External - Technical	2	1	900	1800	270	2070
Internal	2	4	550	4400	660	5060
Testing						
Vendor	2	2	1400	5600	840	6440
External - Technical	2	1	900	1800	270	2070
Internal	2	6	550	6600	990	7590
Implementation & Warranty						
Vendor	2	2	1400	5600	840	6440
External - Technical	0	0	900	0	0	0
Internal	2	5	550	5500	825	6325
Project Management	2	6	1000	12000	1800	13800
Travel and Other Expenses						
Total Resource Estimate						**60030**

APT Allgas Energy Pty Limited

Opex Business Case
Road Map Initiatives
Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100908 Opex Business Case - Road Map Initiatives.doc

Contents

1 Scope Changes

1.1 Road Map Initiatives

1.1.1 Project Overview

APT Allgas has been following an IT Architectural Blueprint and roadmap (RMI) developed in 2006 that supports the business strategic direction while addressing existing architectural weaknesses and functionality that restrain business performance.

The strategic plan proposes to introduce four projects:

- National Works Management;
- Field Data Capture;
- Billing Optimisation;
- Advanced Asset Management.

In February 2009 an independent external review of the RMI was conducted by representatives from Logica. The review established that APT Allgas' 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;
- Delivery of prudent and efficient services to APT Allgas.

That review confirmed that the RMI objectives remain aligned with both APT Allgas 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 an 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;
- Reduction in IT costs through rationalisation of applications and systems.

The Architectural Roadmap (RMI) is designed to take advantage of hardware end of life and software upgrade opportunities to deliver enhanced functionality and reduce total costs of IT ownership.

The forecast cost of the proposed RMI project over the next Access Arrangement period is approximately $2.84m in capital expenditure and $630K of non-recurrent operating expenditure.

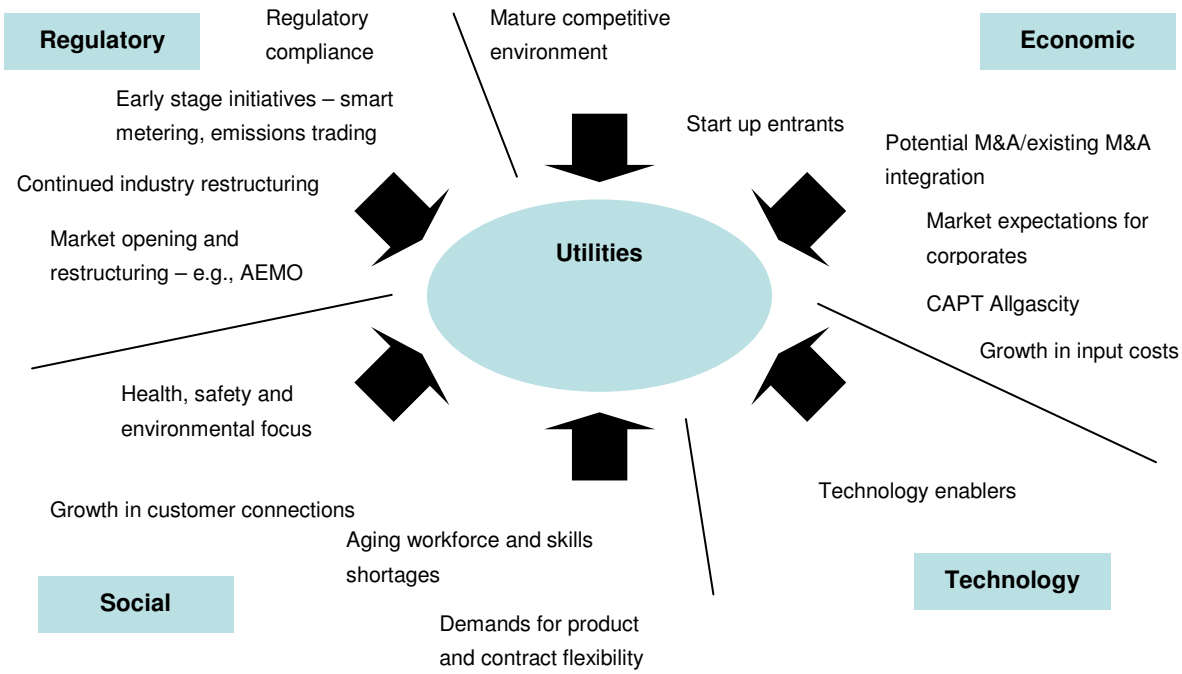
1.1.2 Background

Recent changes in the utilities industry, discussed further below, have necessitated a review of enterprise-wide initiatives to drive productivity and realise efficiencies.

1.1.2.1 Utilities industry issues

The Utilities industry has continued to change, impacting the regulatory, economic, social and technology landscape. APT Allgas has considered these changes throughout this business case. Figure 1 provides an overview of the key issues in the Utilities industry.

Figure 1: Utility Industry Issues



1.1.2.2 Gas industry environment

The gas industry worldwide has experienced significant change over the past decade. This landscape will continue to change with the establishment of the Australian Energy Market Operator (AEMO), the short-term trading market (STTM), the Carbon Pollution Reduction Scheme (CPRS) and with continued industry consolidation.

APT Allgas has considered the following key drivers for change and the associated business implications:

- Aging asset profiles requiring significant investment to replace infrastructure. Opportunities must be sought to improve asset management processes and systems e.g. condition-based maintenance, and mitigate the risk of breakdowns;
- Growth in customer connections and changing consumption patterns which puts a critical reliance on effective load monitoring and forecasting. Opportunities must be sought to improve demand management;
- Increasing reliability, security and customer service expectations requiring additional investment to address reliability gaps within current IT systems and business processes e.g. timely identification of, response to and communication of outages;
- Continued pressure to control costs through the regulatory model. Opportunities must be sought to drive efficiencies through automation and mobility solutions;
- Input costs are rising faster than inflation (CPI) requiring targeted process and system improvements to achieve a shorter return on investment e.g. field force automation and work scheduling. Further consolidation within this sector needs to be considered; and
- Aging workforce and skills shortage requiring significant investment in IT systems and processes to support effective Information Management.

Over the next five to ten years, gas and electricity utilities will invest in a range of new technologies and exploit the capabilities of existing technologies in innovative ways to support improved business performance.

The seven themes within the industry include:

- Streamlining business workflows;
- Productivity and mobility in the extended workforce;
- Customer service;

- Enterprise information management;
- Carbon economy transformation;
- Digitisation of the network; and
- Computerisation and decentralisation.

The above environment and future technology considerations are aligned with the IT strategic direction and incorporated into the Roadmap Initiatives (RMI).

1.1.2.3 IT strategic alignment

The IT Strategic objectives provide the framework for the RMI projects as it aligns the technology portfolio (applications, infrastructure, and information), delivery processes and organisation, and governance framework with the business strategy and requirements for coming period.

The five key IT strategic objectives applied to the RMI were:

- Implement a single scalable business application model;
- Make business data available anywhere and anytime;
- Support business process standardisation and automation;
- Maintain the competitive IT cost base; and
- Achieve best practice service delivery.

Architectural guiding principles define the underlying general rules and guidelines for the use and deployment of all IT resources and assets across APT Allgas' Queensland gas network.

RMI projects

Table 1-1 details projects to complete the scope changes.

Scope changes approved last period	RMI projects to complete scope change delivery	Forecast Cost ($K Real 2009/10)
Works Management Upgrade – upgrade of state based standalone WMS in non FRC landscape	Upgrade of Works Management (4 years old) – Integrated national works management system - core component of FRC solution.	353
Asset Management Optimisation – optimising state based standalone GIS in non FRC landscape	Advanced Asset Management – Integrated national GIS system including spatial analysis & reporting- core component of FRC solution	577
Metering and Billing – establishment of FRC solution	Major upgrade and optimisation of billing solution– Fit for purpose FRC billing solution	1,537
Field Data Capture	Filed Data Capture – Integrated national Field Data capture solution	372
Total		**2,839**

The purpose of this business case is to outline the funding requirements to complete these projects at a cost of $2.84m and to identify further projects that are required in the next Access Arrangement period.

In 2009, as a precursor to this submission, APT Allgas reviewed the RMI as a health-check to ensure that:

- Best business practice was being followed;
- The program was aligned its current IT strategic direction; and
- The ongoing approach for the delivery was sound.

The review was in three stages and involved both internal expertise and external validation by Logica. The review approach and outcomes are as follows:

- Stage 1 - Logica conducted an independent review and validated that the RMI program aligns to the strategic direction of the business and best industry practise;

- Stage 2 – An internal assessment was conducted and options were scoped out to implement the projects under the current regulatory, economic, environmental and technological landscape. A recommended approach was put forward; and
- Stage 3 - Logica independently evaluated the assessment process and endorsed the recommended approach to implement the RMI. This recommended approach forms the basis for this business case.

Outputs from the health-check have been considered and an updated RMI Program has been established.

Updated RMI Program

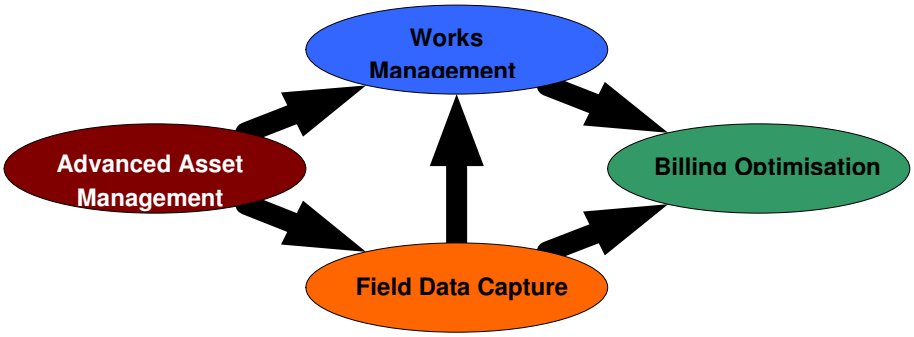
To manage the changing landscape of the gas industry environment, the focus for APT Allgas will be on operating prudently and effectively within the regulatory environment and driving efficiencies through process and system improvements. The existing projects (refer Table 1-1) have been re-aligned to complete the delivery of major system upgrades and core business functionality.

Key objectives are:

- Improve asset management processes and systems;
- Improve demand management;
- Address reliability gaps within current IT systems and business processes;
- Drive efficiencies through automation and mobility solutions; and
- Improve IT systems and processes to support effective Information Management.

The updated RMI program includes four initiatives that are interdependent, with each providing enabling capabilities for subsequent initiatives.

Figure 2 Illustrates the RMI project interdependencies.



The four initiatives that are contained within the RMI project are discussed in detail in the options considered section below.

1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- Aging asset profiles requiring significant investment to replace infrastructure. Opportunities must be sought to improve asset management processes and systems e.g. condition-based maintenance, and mitigate the risk of breakdowns;
- Growth in customer connections and changing consumption patterns which puts a critical reliance on effective load monitoring and forecasting. Opportunities must be sought to improve demand management;
- Increasing reliability, security and customer service expectations requiring additional investment to address reliability gaps within current IT systems and business processes e.g. timely identification of, response to and communication of outages;
- Continued pressure to control costs through the regulatory model. Opportunities must be sought to drive efficiencies through automation and mobility solutions;
- Input costs are rising faster than inflation (CPI) requiring targeted process and system improvements to achieve a shorter return on investment e.g. field force automation and work scheduling. Further consolidation within this sector needs to be considered; and
- Aging workforce and skills shortage requiring significant investment in IT systems and processes to support effective Information Management; and

- Work is to be undertaken by qualified contractors, with supervision by internal personnel.

1.1.4 Costs & Timing

All costs are expressed in $K (Real 2009/10).

The project cost estimates are based on the current schedule of rates with contractors selected through a public tender process. Actual material and direct labour costs, and applicable overhead charges, are based on historic actual costs of similar projects conducted by APT Allgas over previous Access Arrangement periods.

Capex

APT Allgas Queensland Networks has outsourced its capital works program (material and labour) through a public tender process, thereby obtaining a market price with respect to the provision of these services. There is a plan to continue to test the market at regular intervals to ensure that projects are delivered at the lowest sustainable cost. Competitive tendering for the supply of materials is planned each year for the provision of capital works services in two to three year intervals.

Table 1-2and Table 1-3 provide a breakdown, by activity and by type respectively, of the forecast capital costs of the recommended project for the period 1 June 2011 to 30 July 2016. Detailed costs are provided in Attachment A.

Table 1-2 Road Map Initiatives Capital Expenditure by Activity

$K (Real 2009/10)

	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
National Works Management	-	353	-	-	-	**353**
Field Data Capture	-	372	-	-	-	**372**
Billing Optimisation	-	-	750	787	-	**1,537**
Advanced Asset Management	-	-	277	300	-	**577**
Total	-	**1,475**	**1,064**	**300**	-	**2,839**

Table 1-3: Road Map Initiatives Capital Expenditure by Type

$K (Real 2009/10)

	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
Materials	-	621	532	150	-	**1,303**
Direct Labour	-	170	107	130	-	**307**
Contractors	-	632	372	105	-	**1,109**
Planning, Design and Commissioning	-	52	53	15	-	**120**
Total	-	**1,475**	**1,064**	**300**	-	**2,839**

Opex

Table 1-4 and Table 1-5 provide a breakdown, by activity and by type respectively, of the forecast non-recurrent operating costs of the recommended project for the period 1 June 2011 to 30 July 2016. Detailed costs are provided in Attachment A.

Table 1-4: Road Map Initiatives Operating Expenditure by Activity

$K (Real 2009/10)

	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
National Works Management	-	-	-	-	-	**-**
Field Data Capture	-	*150*	*150*	*150*	*150*	**600**
Billing Optimisation	-	-	-	-	-	**-**
Advanced Asset Management	-	-	-	*15*	*15*	**30**
Total	**-**	**150**	**150**	**165**	**165**	**630**

Table 1-5: Road Map Initiatives Operating Expenditure by Type

$K (Real 2009/10)

	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
Materials	-	*50*	*50*	*65*	*65*	**230**
Direct Labour	-	*100*	*100*	*100*	*100*	**400**
Contractors	-	-	-	-	-	
Planning, Design and Commissioning	-	-	-	-	-	
Total	**-**	**150**	**150**	**165**	**165**	**630**

Should the actual costs incurred by APT Allgas significantly exceed the prices used in this Submission, then APT Allgas proposes to apply to the AER for a pass through mechanism for the difference. APT Allgas feels that this approach is the most likely to provide a fair and equitable outcome to all stakeholders

1.1.5 Options Considered

Three main options were considered to address the drivers and IT initiatives required to support APT Allgas' strategic business direction, being:

- Full Advanced Implementation - continue with the original approach and initiate components in the first financial year for a 'fast track' completion;
- Staged Implementation – meet business imperatives by staging implementation over a longer timeframe with projects that deliver a balance between the immediate business benefits and achieving the required technical architectural objectives; and

- Maintain and Service – 'Do Nothing' with no further major projects initiated. Support and maintain existing disparate systems.

APT Allgas considers a staged component implementation for the RMI projects is the optimum approach in terms of a balance between risk and cost as it provides opportunities for reassessment should the strategic direction of the business or the associated technology change.

The below extract provides the key outcomes from the Logica report.

Logica's Assessment

"Logica worked with APT Allgas Group staff in developing the options assessment approach, and it was concluded through a workshop that the spectrum between "do nothing" and full advanced implementation created a range of options.

The "do nothing" option was seen to create an increasingly risky operational landscape, as systems become increasingly unstable and potentially unsupported by the vendors. This option is therefore not viable as it puts APT Allgas into a situation where they could be construed as not operating in a "prudent and efficient" manner.

The full advanced implementation was also considered as a higher risk option, as it required significant investment and resource allocation from both internal and external sources. This "big bang" approach was not seen to offer the best return on investment nor the best risk profile.

Therefore, a hybrid option in the form of a staged component implementation was seen to be the best of both worlds – protecting APT Allgas from operational instability, whilst continuing to move to an industry accepted operational model to support its core FRC and IT systems.

Logica endorses the implementation of this option for the following reasons:

- The original architectural plan for the Roadmap Initiative is still valid e.g. it follows industry best practice as articulated by a number of international sources (Gartner, TOGAF, Institute for Enterprise Architecture Development, Zachman, Forrester);

- APT Allgas has the opportunity to continue to mature and evolve their ICT strategy without disrupting the business or putting it's market compliance at risk; and

A lack of investment in up to date systems will put the business at risk and result in loss of valuable IP and resources required to ensure compliance and prudent and efficient operation."

Each of these options is discussed in turn below.

Option 1: *Staged Implementation - Implementation of four key initiatives*

Cost estimate: $2.84m in capital expenditure and $630K in operating expenditure

Option 1 involves the implementation of the following four projects:

- National Works Management ($353K);
- Field Data Capture ($372K);
- Billing Optimisation ($1.54m); and
- Advanced Asset Management ($577K).

Table 1-6 illustrates the proposed staging of the projects.

	Jul-Dec 2011	*Jan-Jun 2012*	*Jul-Dec 2012*	*Jan-Jun 2013*	*Jul-Dec 2013*	*Jan-Jun 2014*	*Jul-Dec 2014*	*Jan-Jun 2015*
National Works Management								
Field Data Capture								
Billing Optimisation								
Advanced Asset Management								

Each of these four projects is discussed below.

1.1.5.1 *Works Management System*

Cost estimate: $353K

The objective of this project is to upgrade the Maximo works management data into the national works management system (WMS).[1] 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 APT Allgas' 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.

Business Benefits

A high level view of the business benefits are as follows:

- Consistent national WMS processes and practices resulting in cost efficiencies in operations, system support, and projects;
- Greater reporting consistency and accuracy;
- Better informed asset investment decisions at both a state and national level;
- Increased IT efficiencies through simplification and consolidation of systems;
- Better aligned business processes and system functionality;
- Maximised consistency in business activities across APT Allgas national operations; and
- A system that is fully supported and will achieve "future state" benefits.

[1] The upgrade of the Maximo works management data into the national WMS is separate from the minor upgrades and patch updates carried out to maintain vendor support, as detailed in the proposed IT Application Upgrades and Renewals project.

Architectural Alignment

Considerations made to the alignment of the current RMI Architectural Blueprint and APT Allgas' IT strategic direction, include:

- A consolidated national works management solution will be in place, serving the needs of the business;
- Application customisation is minimised regarding state-based differences in regulation and processes, resulting in greater compliance to standard solution design and Service Orientated Architecture (SOA) principles;
- Localised tactical works management systems are retired where appropriate and the national solution adopted;
- Integration of works management to other systems is managed through the integration and business process management capabilities resulting in greater automation of processes and increased maintainability;
- Message translation, transformation, and delivery will become standardised across the applications with technology that is widely supported and incorporated with the majority of the 'off the shelf' solutions on the market;
- Reporting, data integrity, message reliability, and process tractability will greatly increase with each step of the RMI. National WMS delivers a large percentage of the architectural and strategic vision resulting in a solutions model that is not limited by the base technology; and
- Delivery of the RMI architecture which supports a dynamic architecture and SOA compliance. The approach maintains an 'open architecture' principle thus allowing APT Allgas' systems to support ongoing change into the future while retaining fundamental SOA principles.

1.1.5.2 Field Data Capture

Cost estimate: $372K in capital expenditure and $630K in non-recurrent operating expenditure

The objective of this project is to replace paper based processes with electronic work allocation and "in the field" completion of work orders.

This project is required to ensure that APT Allgas has systems and processes in place that will allow it to undertake rigorous assessment of any asset utilisation decisions which will become even more important as further pressure is applied by regulatory bodies to ensure that investments in assets are optimised. Furthermore it is to provide enhanced customer service by enabling rapid access to appropriate information whether for new connections or general enquiries

The solution is based on the available 'out of the box' technology that is compliant with the 'future state' of APT Allgas' systems and architecture.

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.

Business Benefits

A high level view of business benefits are as follows:

- Reduction in manual input around dispatch and work order completion for both field staff and administration staff;
- Removal of 'paper based' issues in work order workflow (i.e. loss of paper work, translation of written data, double handling, etc.);
- Greater field data quality due to validation;
- The ability to extend base technology for additional field benefits like email, electronic manuals, maps, etc.;
- Greater traceability of the end to end work order process;
- Improvements in logistical administration through allocating jobs of similar nature or in specific zones while staff remains in the field;
- More timely tracking of job turnaround time for the management of Service Level Agreements (SLAs);
- Reduction in the use of the 'middle man' as market work orders can move through the full process with only dispatch and completion requiring manual intervention; and
- Increased cost effectiveness of implementing national processes through technology compared to manual processing.

Architectural Alignment

Considerations made to the alignment of the current RMI Architectural Blueprint and APT Allgas' IT strategic direction, include:

- Accurate field data collection linked to clear business KPIs, with service level agreements in place to ensure data quality requirements are met;

- Compliance of Service Orientated Architecture standards with system and process 'change out' becoming less complicated, in addition future software changes easier to integrate;
- Responsiveness to business change due to scalability of technology;
- Reporting from transactional systems for full end to end process becomes more viable;
- Reducing 'islands' of data collection for effective reporting; and
- Using middleware layer and business process workflow thus retaining scalability and introducing real time messaging.

1.1.5.3 Billing Optimisation

Cost estimate: $1.54m

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.

The Customer Care and Billing (CC&B) application is APT Allgas' established billing solution. 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 Market Rules. The CC&B application functionality was more aligned to retailer needs and had to be customised to meet industry rules required by the distributor. 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 nearly half of APT Allgas' business system IT costs. Removing reporting and workflow from the CC&B application opens 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.

Business Benefits

A high level view of business benefits is as follows:

- Reduced complexity with network billing and market transactions to realise operational efficiencies;
- The opportunity to review billing operations and ascertain billing requirements and identify any changes or improvements;
- Reduced software and support costs with the implementation of a simplified solution over time; and
- Reduced need for a complex billing solution through greater use of the Business Processing Workflow (or Middleware) layer.

Architectural Alignment

Considerations made to the alignment of the current RMI Architectural Blueprint and APT Allgas' IT strategic direction, include:

- Following core architectural principles throughout the requirements gathering phase;
- Updating the billing solution to be SOA compliant;
- Providing the final system component change for the 'future state' vision as part of the RMI;
- Moving messaging and appropriate workflow into the integration layer thus reducing complexity of the billing solution. This de-couples APT Allgas specific functionality from the billing system thus allowing the use of a simpler, cost effective, 'off the shelf' billing solution; and
- Centralising business processing and reporting to optimise the use of nationalised systems and processes.

1.1.5.4 Advanced Asset Management

Cost estimate: $577K

The purpose of this project is to upgrade to a national network Geospatial Information System (GIS) solution. In conjunction with this project, integration changes will need to be implemented to retain the architectural model.

APT Allgas' strategy is to integrate the GIS application in Queensland with the Maximo Works Management System forming the core of APT Allgas' Asset Management System used for operational and strategic asset management decisions.

This will bring Queensland into line with APT Allgas' national WMS and GIS integration strategy aimed at providing network capacity and asset replacement management functionality as well as optimising various customer connection and Retail Market business processes. The integration enables address management, leak management and meter to main connectivity to be effectively managed.

Currently the GIS in Queensland is different to the core application used within APT Allgas' networks businesses in South Australia and Victoria. The system will either require a major upgrade or change out to a nationally consistent GIS over the next 5 years. To meet APT Allgas' objectives of cost effectiveness and operational efficiency, the GIS solution must be upgraded/replaced and integrated with the Maximo Works Management System otherwise system change cannot be easily implemented. Without this project any process changes requiring software development will either be cost prohibitive or technically unsound.

The Advanced Asset Management project requires the new WMS to be completed to leverage off architectural changes and technology platforms.

Business Benefits

A high level view of the business benefits is as follows:

- Extension of asset life and reduced maintenance frequency;
- Better informed asset investment decisions;
- Reduced IT costs through simplification and consolidation of systems;
- Aligning business processes and system functionality; and
- Providing architectural flexibility to national systems.

Adoption of the project will result in lower future operating expenditure because of decreased ongoing upgrade costs.

Architectural Alignment

Considerations made to the alignment of the current RMI Architectural Blueprint and APT Allgas' IT strategic direction, include ensuring:

- Information transferring between systems utilising the integration infrastructure are all defined in business terms;
- Service Orientated Architecture is used / supported with any GIS chosen as a national system as APT Allgas will have Service Orientated Architecture in place with the remaining systems;

- Application customisation is minimised with state-based differences in regulation and process treated as the exception rather than the rule;

- Integration of the GIS system with other core systems is managed through the integration and business process management capabilities; and That the GIS system is reviewed for suitability with the consolidated approach to works management.

Option 2: Full Advanced Implementation - continue with the original approach and initiate components in the first financial year for a 'fast track' completion

Cost estimate: less than $3.4m

Option 2 involves fast tracking the projects for early mitigation of risk. This is considered a high risk option as it requires significant early investment and resource allocation.

Option 3: Maintain and Service – 'Do Nothing' with no further major projects initiated. Support and maintain existing disparate systems.

Option 3 involves undertaking no RMI initiatives. The 'do nothing' option is extremely risky, as systems will become increasingly unstable and unsupported by vendors. Option 3 is therefore not viable as it puts APT Allgas in a situation where they could be considered to be not operating in a 'prudent and efficient' manner.

Cost Benefit Analysis

A cost benefit analysis has been undertaken on the options surrounding the identified Road Map Initiatives. As a result:

- Option 1 is considered to be the best solution as it is the only option that allows a cost effective and efficient program of works to be undertaken that:

  - Addresses the underlying drivers affecting the gas distribution industry;

  - Addresses the risks detailed in Attachment B;

  - Aligns with APT Allgas' Strategic IT Plan and Logica's assessment of best practice and associated risks; and

  - Allows APT Allgas' objectives of cost effectiveness and operational efficiency to be met.

The projects identified in option 1 are necessary if APT Allgas is to continue to maintain the integrity of its services in the face of on-going industry changes, in particular, the establishment of the AEMO, the STTM, the CPRS and continued industry consolidation.

Option 1 involves four projects that are highly interdependent, with each providing enabling capabilities for subsequent initiatives. If any of the individual projects identified in option 1 are not implemented the effectiveness and efficiency of the overall RMI project will be compromised. Without either the Works Management System project or the Advanced Asset Management project any process changes requiring software development will either be cost prohibitive or technically unsound.

- Option 2 is not considered to be a prudent solution as it may expose APT Allgas to:
  - A reduction in availability of services;
  - A reduction in integrity of services; and
  - An inability to comply with regulatory obligations or requirements.

The residual risk will continue to be high under this option.

- Option 3 is not considered acceptable as it may also expose APT Allgas to:
  - A reduction in availability of services;
  - A reduction in integrity of services; and
  - An inability to comply with regulatory obligations or requirements.

The risk of not implementing the RMI project has been determined as “High” and has been assigned a Priority 2, as determined by the risk mitigation analysis detailed in Attachment B.

Option 1 is the recommended option as it:

- Addresses the underlying drivers affecting the gas distribution industry;
- Aligns with APT Allgas’ Strategic IT Plan and Logica’s assessment of best practice and associated risks;
- Achieves a significant level of risk reduction as determined by the risk mitigation analysis detailed in Attachment B;
- Allows APT Allgas’ objectives of cost effectiveness and operational efficiency to be met;
- Allows APT Allgas to:
  - Maintain the existing availability of services;
  - Maintain integrity of services; and

- Comply with regulatory obligations or requirements.

Table 1-1 and Table 1-3 provide a breakdown, by activity and by type respectively, of the forecast capital costs of the recommended project for the period 1 June 2011 to 30 July 2016. Table 1-2 and Table 1-5 provide a breakdown, by activity and by type respectively, of the forecast non-recurrent operating costs of the recommended project for the period 1 June 2011 to 30 July 2016. A detailed breakdown of the costs associated with each of the projects identified in option 1 is provided in Attachment A.

Capex / Opex Tradeoff

Substitution between capital and operating expenditure was not a feasible option.

1.1.6 Risk Assessment

If the RMI Strategy is not implemented:

- IT systems may be unable to support business strategic objectives – especially with national alignment and the delivery of initiatives to improve cost effectiveness;
- APT Allgas may be unable to address strategic imperatives and architectural weaknesses identified in the original Strategic Plan;
- Targets for effective IT development and reduced support costs that were identified in the RMI may not be achieved;
- An increased rate of failure in older applications may occur, resulting in unplanned production outages;
- Technology upgrades for core software will be required. Not continuing with the planned upgrades will mean the opportunity for 'change out' of inefficient technologies will be missed; and
- As software licence renewals are becoming due, not continuing with the RMI will lock APT Allgas into old technology and another licence cycle. In some instances the base technology will no longer be supported by the industry.

Risk mitigation analysis has been carried out that shows there is a risk of: non-compliance with relevant regulations and legislation; potential customer and business interruption and adverse financial and reputation impacts.

On this basis the RMI project has been assessed as "High" and has been assigned Priority 2.

The risk assessment and estimated risk levels for each of the options are detailed in Attachment B.

		Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total
Risk	**Likelihood**	Rare	Possible	Possible	Rare	Possible	Possible	
	Consequence	Minor	Severe	Moderate	Minor	Moderate	Minor	
	Risk Level	Low 01	High 13	Moderate 08	Low 01	Moderate 08	Low 04	35
Option 1 Residual Risk	**Likelihood**	Rare	Unlikely	Unlikely	Rare	Unlikely	Unlikely	
	Consequence	Minor	Minor	Minor	Minor	Minor	Minor	
	Risk Level	Low 01	Low 02	Low 02	Low 01	Low 02	Low 02	10

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 APT Allgas.
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 APT Allgas, 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.

1.1.7 Justification

Consistent with the requirements of Rules 79(1)(a) and 91, APT Allgas considers that the additional $2.84m in capital expenditure and $630K in operating expenditure that it is seeking in order to implement the RMI project is:

- Prudent – the expenditure is necessary in order to maintain the integrity of services and comply with regulatory obligations and requirements.

- The recommended project will allow APT Allgas to meet its objectives of cost effectiveness and operational efficiency as outlined in its IT Strategy Plan and address the identified risks of non-compliance with relevant regulations and legislation, potential customer and business interruptions and corresponding adverse financial and reputation impacts. If the RMI project is not implemented:

  - IT systems may be unable to support business strategic objectives;
  - APT Allgas may be unable to address strategic imperatives and architectural weaknesses identified in the original Strategic Plan;
  - Targets for effective IT development and reduced support costs that were identified in the RMI may not be achieved;
  - An increased rate of failure in older applications may occur, resulting in unplanned production outages;
  - Technology upgrades for core software will be required and the opportunity for 'change out' of inefficient technologies will be missed; and
  - APT Allgas will be locked into old technology and another software licence cycle.

- Efficient – APT Allgas has considered different options and undertaken a cost benefit analysis, where the project was selected on the basis of:

  - Addressing the underlying drivers affecting the gas distribution industry;
  - Aligning with APT Allgas' Strategic IT Plan and Logica's assessment of best practice and associated risks;
  - Achieving a significant level of risk reduction as determined by the risk mitigation analysis detailed in Attachment B;
  - Allowing APT Allgas' objectives of cost effectiveness and operational efficiency to be met;
  - Allowing APT Allgas to:
    - Maintain the existing availability of services;
    - Maintain integrity of services; and
    - Comply with regulatory obligations or requirements.

Additionally, the RMI project consists of four sub projects that are highly interdependent, with each providing enabling capabilities for subsequent initiatives. If any of the individual projects are not implemented the effectiveness and efficiency of the overall RMI project will be compromised. For example, without either the Works Management System project or the Advanced Asset Management project any process changes requiring software development will either be cost prohibitive or technically unsound.

The cost estimates for this project are based on the current schedule of rates with contractors selected through a public tender process. Actual material and direct labour costs are based on historic actual costs of similar projects conducted by APT Allgas over previous Access Arrangement periods.

For these reasons, the additional $2.84m in capital expenditure and $630K in operating expenditure is considered efficient;

- Consistent with accepted and good industry practice – implementing the RMI project will allow APT Allgas' business objectives to be aligned with its IT strategy and capabilities. The proposed benefits that would be derived from the RMI project include:

    - Consistent processes and practices resulting in cost efficiencies in operations, system support, and projects;
    - Improved data quality and reporting consistency and accuracy to enable more informed decisions;
    - Increased IT efficiencies through simplification and consolidation of systems reducing costs over time;
    - Aligned business processes and system functionality to drive business efficiencies;
    - Automation and mobility solutions needed to meet market rules and reduce duplication of work tasks;
    - Reduced complexity with market transactions to realise operational efficiencies;
    - Greater use of the Business Processing Workflow (or Middleware) layer, which has the potential to reduce the need for complex solutions;
    - Alignment to best practise architectural principles;
    - Continuation of vendor support;
    - Security and integrity of business information'

- Stability of systems; and
- Compliance of systems.

The RMI project will also address risks of non-compliance with relevant regulations and legislation, potential customer and business interruptions and corresponding adverse financial and reputation impacts. The RMI project has taken into consideration an independent assessment by Logica and been internally assessed against different options. On this basis, the additional $2.84m in capital expenditure and $630K in operating expenditure is consistent with accepted and good industry practice; and

- Necessary to achieve the lowest sustainable cost of delivering pipeline services – the RMI project is necessary to address the changes in the utilities industry and the significant risks associated with maintaining the status quo, as detailed in the risk assessment and Attachment B. The $2.84m in capital expenditure and $630K in operating expenditure that APT Allgas is seeking is the only option that takes into account the highly interdependent nature of the four sub projects, with each project providing enabling APT Allgas abilities for subsequent initiatives. If any of the individual projects are not implemented the effectiveness and efficiency of the overall RMI project will be compromised. Therefore, the recommended project offers the most effective and efficient solution and will allow the efficiency greatest benefits to be achieved and potentially passed through to customers in the form of a relative reduction in customer tariffs.

- On this basis, the additional expenditure is necessary to achieve the lowest sustainable cost of delivering the pipeline services.

In response to Rule 79(1)(b), APT Allgas considers that the additional $2.84m in capital expenditure is justifiable under Rules 79(2)(c)(i) and (ii) as the expenditure is necessary in order both to maintain the integrity of services and comply with regulatory obligations and requirements. The recommended project will address these requirements by enabling APT Allgas to:

- Apply consistent processes and practices resulting in cost efficiencies in operations, system support, and projects;

- Improve data quality and reporting consistency and accuracy to enable more informed decisions;

- Increase IT efficiencies through simplification and consolidation of systems reducing costs over time;

- Align business processes and system functionality to drive business efficiencies;

- Automate and implement mobile solutions needed to meet market rules and reduce duplication of work tasks;

- Reduce complexity with market transactions to realise operational efficiencies;
- Increase the use of the Business Processing Workflow (or Middleware) layer, which has the potential to reduce the need for complex solutions;
- Align to best practise architectural principles;
- Enable continuation of vendor support;
- Maintain and improve security and integrity of business information; and
- Maintain and improve the stability and compliance of systems.

1.1.8 Step Change Not in Base Year Costs

APT Allgas confirms that the additional in operating expenditure associated with the Road Map Initiative Project in its Queensland distribution network is not included in the base year costs for 2009/10.

1.1.9 Project Delivery

APT Allgas confirms that it will use a combination of internal and external resources to deliver the recommended project.

1.1.10 Consequences of Not Proceeding

If this project is not undertaken, then APT Allgas will:

- Be exposed to:
  - A material risk of non-compliance with relevant regulations and legislation, potential customer and business interruptions and corresponding adverse financial and reputation impacts;
  - IT systems that may be unable to support business strategic objectives;
  - An inability to address strategic imperatives and architectural weaknesses identified in the original Strategic Plan;
  - An inability to achieve the targets for effective IT development and reduced support costs that were identified in the RMI;

- An increased rate of failure in older applications may occur, resulting in unplanned production outages;
- A missed opportunity for ‘change out’ of inefficient technologies; and
- Being locked into old technology and another software licence cycle;

- Need to divert expenditure from other necessary projects which will have a detrimental effect on APT Allgas’ overall service delivery.

ATTACHMENT A – ROAD MAP INITIATIVES – COST ESTIMATES

Works Management

Cost Estimate

Capital Expenditure Estimate

Description	Cost ($K)
Resources	337
Licensing	0
Infrastructure	16
Total	**353**

16 ***week project to complete***

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	1	10	1,900	19,000	2,850	21,850
Technical	1	15	930	13,950	2,093	16,043
Design						
Vendor	1	10	1,900	19,000	2,850	21,850
Technical	2	15	930	27,900	4,185	32,085
Data Conversion						
Vendor	1	2	1,900	3,800	570	4,370
Technical	2	15	930	27,900	4,185	32,085
Testing						
Vendor	1	6	1,900	11,400	1,710	13,110
Testers	3	20	700	42,000	6,300	48,300
Implementation & Warranty						
Vendor	1	5	1,900	9,500	1,425	10,925
Technical	1	15	930	13,950	2,093	16,043
Business	1	15	550	8,250	1,238	9,488
Project Management	1	80	1,100	88,000	13,200	101,200
Travel and Other Expenses						10,000
Total Resource Estimate						**337,348**

Annual Opex

Description	Cost ($K)	
Resources	0	offset with savings
Licensing	0	no additional
Infrastructure	0	no additional
Total	**0**	

Field Data Capture
Cost Estimate

Capital Expenditure Estimate

Description	Cost ($K)	
Resources	142	
Licensing	160	35 users @ $4800/user
Infrastructure	70	
Total	**372**	***10 week project to complete***

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	1	0	1,900	0	0	0
Technical	1	0	930	0	0	0
Design						
Vendor	1	3	1,900	5,700	855	6,555
Technical	1	15	930	13,950	2,093	16,043
Testing						
Vendor	1	0	1,900	0	0	0
Testers	2	15	700	21,000	3,150	24,150
Implementation & Warranty						
Vendor	1	5	1,900	9,500	1,425	10,925
Technical	1	15	930	13,950	2,093	16,043
Business	1	20	550	11,000	1,650	12,650
Project Management	1	40	1,100	44,000	6,600	50,600
Travel and Other Expenses						5,000
Total Resource Estimate						**141,965**

Annual Opex

Description	Cost ($K)	
Resources	100	1x FTE
Licensing	40	20% of license
Infrastructure	10	patches etc
Total	**150**	

Billing Optimisation

Cost Estimate

Capital Expenditure Estimate

Description	Cost ($K)
Resources	1,087
Licensing	0
Infrastructure	450
Total	**1,537**

50 ***week project***

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	1	10	1,900	19,000	2,850	21,850
Technical - Ext	1	20	930	18,600	2,790	21,390
Internal	1	20	550	11,000	1,650	12,650
Design						
Vendor	1	20	1,900	38,000	5,700	43,700
Technical - Ext	2	80	930	148,800	22,320	171,120
Internal	1	60	550	33,000	4,950	37,950
Data Conversion						
Vendor	1	10	1,900	19,000	2,850	21,850
Technical - Ext	3	60	930	167,400	25,110	192,510
Testing						
Vendor	1	15	1,900	28,500	4,275	32,775
Technical - Ext	3	60	930	167,400	25,110	192,510
Internal	1	40	550	22,000	3,300	25,300
Implementation & Warranty						
Vendor	1	10	1,900	19,000	2,850	21,850
Technical - Ext	1	30	930	27,900	4,185	32,085
Business	2	30	550	33,000	4,950	37,950
Project Management	1	250	1,100	275,000	41,250	316,250
Travel and Other Expenses						5,000
Total Resource Estimate						**1,087,150**

Annual Opex

Description	Cost ($K)	
Resources	0	offset with savings
Licensing	0	no additional
Infrastructure	0	no additional
Total	**0**	

Advanced Asset Management
Cost Estimate

Capital Expenditure Estimate

Description	Cost ($K)
Resources	447
Licensing	80
Infrastructure	50
Total	**577**

16 week project

Resources	Number of Resources	Effort (Days)	Daily Rate ($)	Cost ($)	Contingency ($)	Total Cost ($)
Impact Statement						
Vendor	1	5	1,900	9,500	1,425	10,925
Technical - Ext	1	10	930	9,300	1,395	10,695
Business	2	10	550	11,000	1,650	12,650
Design						
Vendor	1	10	1,900	19,000	2,850	21,850
Technical - Ext	3	20	930	55,800	8,370	64,170
Business	2	20	550	22,000	3,300	25,300
Data Conversion						
Vendor	1	10	1,900	19,000	2,850	21,850
Technical - Ext	3	20	930	55,800	8,370	64,170
Testing						
Vendor	1	5	1,900	9,500	1,425	10,925
Testers - Ext	2	20	700	28,000	4,200	32,200
Business	3	10	550	16,500	2,475	18,975
Implementation & Warranty						
Vendor	1	2	1,900	3,800	570	4,370
Technical - Ext	2	10	930	18,600	2,790	21,390
Business	2	10	550	11,000	1,650	12,650
Project Management	1	80	1,100	88,000	13,200	101,200
Travel and Other Expenses						14,000
Total Resource Estimate						**447,320**

Annual Opex

Description	Cost ($K)	
Resources	0	offset with savings
Licensing	15	% of license fee
Infrastructure	0	no additional
Total	**15**	

APT Allgas Energy Pty Limited

Opex Business Case
Knowledge Management
Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100908 Opex Business Case - Knowledge Management.doc

Contents

1.1 Knowledge Management

1.1.1 Project Overview

This project is required to develop and support a knowledge management solution for APT Allgas.

In the past APT Allgas have relied on 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 shorter length of employment (typically of 5 to 10 years) rather than longer (eg.15 years and more). Coupled with the changing employment environment and an aging workforce is also the changing business environment which is seeing more and more regulation and auditing by external bodies which is placing a stronger need to have well documented processes and information that can be audited and systems to manage the documentation.

The purpose of this business case is to detail the funding requirements to complete the project in the next Access Arrangement period.

1.1.2 Background

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.

Coupled with the changing employment environment is the changing business environment, which is seeing increasing levels of regulation and auditing by external bodies.

There is also a growing requirement to meet counter terrorism obligations, where, for example, other states, such as Victoria, are now operating under the Terrorism Community Act 2003. As gas is identified as an essential service there are regular exercises carried out which simulate terrorist attacks. Access to well managed information content is critical as part of these simulations. These additional requirements are creating a greater need to have well documented processes, information that can be audited and systems to manage the documentation.

Additionally, there is also the continual need and drive for the business to become more customer service focused, which inherently means that the business must become more cohesive, rather than operating in departmental silos. The practical

outcome of this is that in the future APT Allgas will need to ensure that all staff involved in a particular process has a good understanding of not only their role in the process, but how the process works from end to end.

1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- APT Allgas' current workforce is aging;
- The ageing workforce, which holds the vast majority of the knowledge, is being replaced with employees who are more likely to move in shorter timeframes;
- The loss of knowledge resulting from the turnover of senior staff may start to impact business operation in the medium to longer term;
- The business environment is seeing increasing levels of regulation and auditing by external bodies requiring a greater need to have well documented processes, information that can be audited, and systems to manage the documentation;
- The increased focus on customer service, which requires that all staff involved in a particular process have a good understanding of not only their role in the process, but how the process works from end to end; and
- Labour is charged internally at $600 per day and external costs have been based on market rates.

1.1.4 Costs & Timing

All costs are expressed in $2009/10 real.

The majority of the costs for this project occur in the 1st year where capital investment is required to implement a robust document management system. This investment requires the support of a formal project team to complete, however, for future years the focus of costs is on delivery of knowledge programs which will utilise direct labour only.

The forecast costs for this project are based on:

- Market prices of infrastructure and applications software; and
- Labour rates have been based on current internal daily rates ($600) plus current market vendor costs. Hours have been determined based on similar installations.

A detailed cost breakdown has been provided in Attachment A.

Capex

Table **Error! No text of specified style in document.**-1 and Table **Error! No text of specified style in document.**-2 provide a breakdown of the forecast capital costs of the recommended project for the period 1 June 2011 to 30 July 2016.

*Table **Error! No text of specified style in document.**-1: Operations - Knowledge Management Capital Expenditure*

$K (Real 2009/10)						
	2011 -12	**2012 -13**	**2013 -14**	**2014 -15**	**2015 -16**	**Total**
Infrastructure – (2 Standard servers and 4TB SAN) - refer Attachment 1	125	-	-	-	-	**125**
Applications – Oracle ECM – includes Universal Content Management, Content Conversion Server, Universal Records Management, and Imaging and Process Management (based on 4 server licences) – refer Attachment C	200	-	-	-	-	**200**
Project Management – implementation of ECM solution (CKO) - Based on a 2008 Project Management Salary Survey	50					**50**
Resourcing:						
Business Analyst	30	-	-	-	-	**30**
Technical	30	-	-	-	-	**30**
Testing	20	-	-	-	-	**20**
Training	20	-	-	-	-	**20**
Total	475	-	-	-	-	475

*Table **Error! No text of specified style in document.**-2: Operations - Knowledge Management Capital Expenditure by Type*

$K (Real 2009/10)						
	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	**Total**
Materials	325	-	-	-	-	**325**
Direct Labour	50	-	-	-	-	**50**
Contractors	100	-	-	-	-	**100**
Other	-	-	-	-	-	
Total	**475**	**-**	**-**	**-**	**-**	**475**

Opex

Table **Error! No text of specified style in document.**-4 and Table **Error! No text of specified style in document.**-4 provide a breakdown of the forecast operating costs of the recommended project for the period 1 June 2011 to 30 July 2016.

*Table **Error! No text of specified style in document.**-3: Operations - Knowledge Management Operating Expenditure*

$K (Real 2009/10)						
	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	**Total**
Licence Support – Oracle ECM (refer Attachment 2)	-	46	46	46	46	**184**
Application Support – Ongoing business technical support (internal)	-	100	100	100	100	**400**
Total	**-**	**146**	**146**	**146**	**146**	**584**

*Table **Error! No text of specified style in document.**-4: Operations - Knowledge Management Operating Expenditure by Type*

$K (Real 2009/10)						
	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	**Total**
Materials	-	46	46	46	46	**184**
Direct Labour	-	100	100	100	100	**400**
Contractors	-	0	0	0	0	**0**
Other	-	0	0	0	0	**0**
Total	**-**	**146**	**146**	**146**	**146**	**584**

1.1.5 Options Considered

Knowledge Management Approach

Cost estimate: $1.06m, consisting of $475K in capital expenditure and $584K in operating expenditure.

The changing environment in which APT Allgas 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:

- Scoping of the requirements and approach required by APT Allgas to manage knowledge across the business;
- Documentation of end to end business processes of the whole business, much the same as was done for FRC activities; and
- 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 Figure 1.

Figure 1: Knowledge Management Approach

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		
	Motivation Strategy		
GROW	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.

No other options have been considered.

Cost Benefit Analysis

A cost benefit analysis has been undertaken on the project to facilitate knowledge management within APT Allgas' business. As a result the benefits are considered to include:

- Comprehensive content management to derive increased business value from information assets;
- Acceleration of internal and external shared business processes;
- Efficiencies in finding and accessing information to drive better informed decisions;
- Simplified knowledge sharing within and across APT Allgas' organisational boundaries; and
- Greater retention of APT Allgas organisational knowledge.

More specifically, the implementation of document management would achieve:

- Greater employee efficiencies by providing easy reuse of information by organised and classified content within a centralised document repository. This would provide a consistent method for organising, categorising, navigating through, and quickly searching for the right information;

- Protection of organisation sensitive information with integrated rights management that travels with documents wherever they go; and

- Streamlined collaborative document creation and capture.

Additionally, the implementation of records management would achieve:

- Improved legal and regulatory compliance by applying information retention, protection and auditing policies to business records to help ensure these records are appropriately retained;

- Secure business and vital records by using a security-enhanced repository which ensures that records are locked in the final state; and

- Easy litigation discovery which helps ensure that information required for legal discovery can be retrieved in a cost-effective manner and placed on hold as per the discovery requirements.

Table **Error! No text of specified style in document.**-1 to Table **Error! No text of specified style in document.**-4 provide a breakdown of the forecast capital and operating costs of the recommended project for the period 1 June 2011 to 30 July 2016. A detailed cost breakdown has been provided in Attachment A.

Capex / Opex Tradeoff

Substitution between operating and capital expenditure has been considered and it has been assessed that both capital and operating expenditure is required to support this project.

1.1.6 Risk Assessment

The primary driver for this project is to mitigate the risks associated with losing critical competencies and intellectual capital due to staff turnover as well as support the business in managing increased regulation and auditing by external authorities.

If this project is not undertaken then there is a real risk that intellectual knowledge will be lost as the ageing workforce, which holds the vast majority of the knowledge, is replaced with employees who are more likely to move in shorter timeframes. The loss of this knowledge may start to impact business operation in the medium to longer term.

The Operations - Knowledge Management project has been assessed as "Moderate" and has been assigned Priority 3.

The risk assessment and estimated risk levels for each of the options are detailed below.

		Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total
Risk Untreated	**Likelihood**	*Unlikely*	*Possible*	*Possible*	*Unlikely*	*Possible*	*Unlikely*	
	Consequence	*Moderate*	*Moderate*	*Moderate*	*Minor*	*Moderate*	*Minor*	
	Risk Level	*Low 05*	*Moderate 08*	*Moderate 08*	*Low 02*	*Moderate 08*	*Low 02*	*33*
Risk Mitigated	**Likelihood**	*Rare*	*Unlikely*	*Rare*	*Rare*	*Unlikely*	*Unlikely*	
	Consequence	*Minor*	*Moderate*	*Minor*	*Minor*	*Minor*	*Minor*	
	Risk Level	*Low 01*	*Low 05*	*Low 01*	*Low 01*	*Low 02*	*Low 02*	*12*

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 APT Allgas.
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 APT Allgas, 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.

1.1.7 Justification

Consistent with the requirements of Rule 79(1)(a) and 91, APT Allgas considers that the additional $475K in capital expenditure and $584K in operating expenditure that

it is seeking in order to maintain and improve the safety of services and comply with a regulatory obligation or requirement is:

- Prudent – the expenditure is necessary in order to maintain and improve the safety of services and comply with a regulatory obligation or requirement.

- The project will improve the capture and access of knowledge to assist with better decision making by the business and improve in the retention of knowledge within the organisation. The project will enable APT Allgas to more effectively and efficiently meet the requirements of Australian Standard AS2885 – (Pipelines—Gas and liquid petroleum Part 3: Operation and maintenance), which states that documents must be kept for the life of a pipeline.

The benefits of the project will include:

- Comprehensive content management to derive increased business value from information assets;

- Acceleration of internal and external shared business processes;

- Efficiencies in finding and accessing information to drive better informed decisions;

- Simplified knowledge sharing within and across APT Allgas' organisational boundaries; and

- Greater retention of APT Allgas organisational knowledge.

- Efficient – the project will improve the capture and access of knowledge to assist with better decision making by the business and improve in the retention of knowledge within the organisation. The document management will lead to greater labour efficiencies by providing easy reuse of information by organised and classified content within a centralised document repository, while the records management will result in efficiencies in finding and accessing information to drive better informed decisions.

In addition, the cost estimates for this project are based on market prices for infrastructure and applications software (Internal: 15 days @ $600 per day plus external costs of $125 - $200 per hour depending on service offered)

For these reasons, the additional $465K in capital expenditure and $584K in operating expenditure is considered efficient;

- Consistent with accepted and good industry practice – the need for greater knowledge management in organisations is increasing due to number of factors, including the move towards a shorter tenure of employment and increased regulatory requirements. This represents a trend that impact on all businesses in the industry and is amplified in APT Allgas' case due to its aging workforce.

The move towards increased knowledge management in the industry was recognised by the ECG in its 2006 review of capital and operating expenditure for the Envestra Brisbane networks, where it stated that:

- "…there is an increasing reliance on IT systems in all businesses. In the utilities sector, there is an ongoing investment in IT to increase productivity, ensure data integrity and reduce reliance on an individual's knowledge."

The benefits of the project will include:

- Comprehensive content management to derive increased business value from information assets;
- Acceleration of internal and external shared business processes;
- Efficiencies in finding and accessing information to drive better informed decisions;
- Simplified knowledge sharing within and across APT Allgas' organisational boundaries; and
- Greater retention of APT Allgas organisational knowledge.

On this basis, the additional $475K in capital expenditure and $584K in operating expenditure is consistent with accepted and good industry practice; and

Necessary to achieve the lowest sustainable cost of delivering pipeline services – the Operations – Knowledge Management project is necessary to improve the capture and access of knowledge to assist with better decision making by the business and improve in the retention of knowledge within the organisation. If this project is not undertaken then there is a real risk that intellectual knowledge will be lost as the ageing workforce, which holds the vast majority of the knowledge, is replaced with employees who are more likely to move in shorter timeframes. The loss of this knowledge may prove costly, lead to increased inefficiencies and start to impact business operation in the medium to longer term. The project will address these issues and will over time improve the efficiency of APT Allgas' pipeline services. The additional $475K in capital expenditure and $584K in operating expenditure that APT Allgas is seeking is based on market prices for infrastructure and applications software (Internal: 15 days @ $600 per day plus external costs of $128 per hour)

On this basis, the additional expenditure is necessary to achieve the lowest sustainable cost of delivering the pipeline services.

In response to Rule 79(1)(b), APT Allgas considers that the additional $475K in capital expenditure and $584K in operating expenditure is justifiable under Rule 79(2)(c)(i) and (iii) as the expenditure is necessary in order to improve the safety of services and comply with a regulatory obligation or requirement.

The project will improve the capture and access of knowledge to assist with better decision making by the business and improve in the retention of knowledge within the organisation. This will ensure critical knowledge is retained in the organisation and readily available for planning and maintenance purposes and in the event of emergencies. The project will also meet the requirements of Australian Standard AS2885 – (Pipelines—Gas and liquid petroleum Part 3: Operation and maintenance), which states that documents must be kept for the life of a pipeline.

1.1.8 Step Change Not in Base Year Costs

APT Allgas confirms that the additional in operating expenditure associated with the Road Map Initiative Project in its Queensland distribution network is not included in the base year costs for 2009/10.

1.1.9 Project Delivery

Upfront investment in the 1st year of the project will fast track the delivery of the infrastructure needed to support the Knowledge Management effort. Ongoing cost includes the delivery of identified knowledge programs which will utilise direct labour only over the next 4 years.

APT Allgas confirms that it will use a combination of internal and external resources to deliver the recommended project.

1.1.10 Consequences of Not Proceeding

If this project is not undertaken, then APT Allgas will face the risk of losing critical competencies and intellectual capital due to staff turnover as well as support the business in managing increased regulation and auditing by external authorities.

There is a real risk that intellectual knowledge will be lost as the ageing workforce, which holds the vast majority of the knowledge, is replaced with employees who are more likely to move in shorter timeframes. The loss of this knowledge may start to impact business operation in the medium to longer term.

ATTACHMENT A – COST BREAKDOWN

Standard Server				$ -	
491332-371	HP DL380 G6 E5540 Base AP Svr	1	$ 5,363.64	$ 4,469.70	$ 4,470
462969-B21	HP 650 mAh P-Series Battery	1	$ 254.55	$ 212.13	$ 212
507125-B21	HP 146GB 6G SAS 10K 2.5in DP ENT HDD	6	$ 518.18	$ 431.82	$ 2,591
512545-B21	HP 72GB 6G SAS 15K 2.5in DP ENT HDD	2	$ 571.82	$ 476.52	$ 953
481041-B21	HP Slim 12.7mm SATA DVD Optical Kit	1	$ 168.18	$ 140.15	$ 140
503296-B21	HP 460W HE 12V Hotplg AC Pwr Supply Kit	1	$ 445.45	$ 371.21	$ 371
512485-B21	HP iLO Adv 1-Svr incl 1yr TS&U SW	1	$ 600.00	$ 500.00	$ 500
HA104A5	HP 5y 4h 24x7 HW Support	1	$ -	$ -	$ -
HA104A5#7G3	Proliant ServerDL38x HWSupport	1	$ 3,634.00	$ 3,028.33	$ 3,028
	Assume 30 LTO4 tapes				$ 3,000
					$ 15,265

SAN					
Compellent SAN	Only for 4TB, the current San has 8TB Based on SAN purchased Sept 09)				$ 180,000
Commissioning Fee					$ 40,000
HP San allowing for 4.2 TB of usable storage					**$220,000**

4TB SAN $110K

1 standard servers $ 15K

Infrastructure Total $125K

APT Allgas Energy Pty Limited

Opex Business Case
SCADA Upgrade
Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100929 - SCADA Upgrade.doc

Contents

1.1 SCADA Upgrade

1.1.1 Project Overview

This project is to support the periodic upgrade of the SCADA system over the next Access Arrangement period for a forecast cost of $666,000.

Significant investment has been made in recent years to ensure that APT Allgas' systems, including the SCADA system, meet the obligations as set out in the Retail Market Procedures. APT Allgas needs to ensure this investment is managed and maintained.

Currently, APT Allgas' SCADA server warranty period expires in 2014. Once the warranty expires the downtime will almost certainly be increased as the vendor's 24 hour, 7 days a week agreement to respond will not be available. APT Allgas' current policy is to have planned replacement of servers as their warranty expires.

1.1.2 Background

The SCADA system is an integral part of APT Allgas' suite of integrated IT systems, which also includes applications, such as:

- Metering and billing;
- Works management;
- Geographical information systems (GIS); and
- Financial.

All of these applications are linked. This allows 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 APT Allgas' business requirements.

Significant investment has been made in recent years to ensure that APT Allgas' systems, including the SCADA system, meet the obligations as set out in the Retail Market Procedures. APT Allgas needs to ensure this investment is managed and maintained.

Currently, APT Allgas' SCADA server warranty period expires in 2014. 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 not be available. Server downtime will be increased as the vendor's 24 hour, 7 days a week agreement to respond will not

be available. For this reason, APT Allgas' current policy is to replace servers as their warranty expires. 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. Migration of data from one server to another can be fraught with issues, particularly where an operating system upgrade is also required (as is often the case).

At the time of virtualisation, SAN and server blade technologies will be considered where appropriate, but may not necessarily form part of this upgrade as this technology is not currently compatible some of the technologies employed, e.g.: PCI RS-232 expansion cards, Citect etc.

A stay in business program of work has been established to apply minor upgrades to critical business IT applications, including the SCADA system, every three years. The three year duration is in line with prudent industry practise and is required to ensure:

- Continuation of vendor support;
- Security and integrity of business information;
- Stability of systems; and
- Compliance of systems.

APT Allgas' SCADA system comprises:

- CITECT SCADA software and human machine interface (HMI);
- Elster dataloggers and flow correctors;
- Kingfisher MTU and Remote Terminal Units (RTUs) – Responsible for gathering and providing status information from field instruments such as valve positions and pressure and temperature transducers;
- Hewlett Packard SCADA system servers;
- Wonderware Historian software – to allow trending and other analytical auditing;
- Citect Paging Reporting and alarm application software; and
- Associated communication infrastructure.

1.1.3 Key Assumptions/Drivers

This project is required to keep the current system operational. No significant enhancements are planned.

The key assumptions and drivers for the recommended project are:

- The SCADA system is an integral part of APT Allgas' critical IT applications, which are linked together and reliant on each other to allow high volumes of inter-application transactions;
- It is necessary to ensure the full functionality of these linked applications to satisfy retail market rules and APT Allgas' business requirements;
- Significant investment has been made in recent years to ensure that APT Allgas' systems meet APT Allgas' obligations as set out in the retail market rules. APT Allgas 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, including SCADA, every three to four years. The three year duration is in line with prudent industry practise and is required to ensure:
  - Continuation of vendor support;
  - Security and integrity of business information and systems;
  - Stability and reliability of systems and components; and
  - Compliance of systems;
- In the event of the SCADA system upgrade not being implemented there is a risk of:
  - Cessation of Vendor support;
  - Applications and devices becoming increasingly unstable;
  - Inability to address strategic imperatives and architectural weaknesses;
  - Increased rate of failure in older applications and devices, resulting in unplanned and extended production outages;
  - Major failure resulting in non-compliance with market rules; and diminished safety for the public.
- Work is to be undertaken by qualified contractors, with supervision by internal personnel.

A three year cycle of review and replacement for key SCADA components is recommended to prevent vendors discontinuing support, and components becoming unreliable or unusable. A regular cycle of patching and operating system upgrades to meet security requirements contributes significantly to this.

Examples of problems that have occurred or could have occurred in the current period include:

- The retirement of Citect's IDC client. Continuing to use this client will result in an increase in the problems with operators accessing the SCADA system. Previously, outages of several weeks duration have occurred while solutions have been researched. This is not acceptable. This is a safety issue.

- The discontinuation of support for Microsoft Server 2000. Microsoft no longer maintain patches for this operating system. This means that the operating system is no longer able to meet the demands of the ever evolving security environment. This leaves the SCADA system vulnerable to catastrophic failure. It also means that IT staff must support multiple platforms, forcing them to struggle on with legacy operating systems.

- The discontinuation of support for the previous DELL servers. SCADA systems require a 24 x 7 support agreement for hardware as they are critical infrastructure providing both operational data and safety systems. Extended outages are not acceptable. Over time equipment becomes unsupported as stock levels of parts decrease, and vendor expertise diminishes.

- The discontinuation of the Trio SR radio series.

1.1.4 Costs & Timing

Costs are based on historic costs of similar projects.

The most recent expenditure of this type has been as part of the FRC upgrade completed in the last two years.

The following table provides a breakdown, by activity of the forecast costs of the recommended project for the period 2011-16 AA period.

Table 1: SCADA Upgrade Expenditure

SCADA Upgrade ($K 2010/11)						
	2011 -12	**2012 -13**	**2013 -14**	**2014 -15**	**2015 -16**	**Total**
Historian Upgrade	-	-	102	-	102	**204**
SCADA Upgrade	96	-	-	96	-	**193**
Expansion of system	-	19	-	19	-	**39**
MTU replacement	-	30	-	-	-	**30**
Server replacement	100	-	-	100	-	**200**

SCADA Upgrade ($K 2010/11)						
	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
Total	**196**	**49**	**102**	**216**	**102**	**666**

NB. Totals may not add due to rounding.

1.1.5 Options Considered

Option 1: *(Recommended Option) Upgrade of SCADA systems*

Cost estimate: $666K

Option 1 involves upgrades to:

- CITECT SCADA software;
- Wonderware Historian – FRC Elster and Aegis drivers, telemetry;
- MTU; and
- Servers for SCADA, Historian, alarm and applications replacement.

Option 2: *Reduce the scope*

Cost estimate: less than $636K

Option 2 involves reducing the scope of the upgrades identified in option 1 by not providing the following:

- The MTU upgrade; and
- Any expansion to the system.

Option 2 also involves reducing the server upgrade frequency from three to five years.

Cost Benefit Analysis

Cost Benefit Analysis

Option 1 is considered to be the best solution as it is the only option to address the risks associated with the failure to upgrade the SCADA system; and

Option 2 is not considered to be a prudent solution as it may expose APT Allgas to:

- A reduction in availability of services;
- A reduction in integrity of services; and
- An inability to comply with regulatory obligations or requirements.

The residual risk will continue to be high under this option.

Option 1 is the recommended option as it:

- Is the only option to address the risks associated with the failure to upgrade the SCADA system;
- Achieves a significant level of risk reduction as determined by the risk mitigation analysis detailed in Attachment B
- Allows APT Allgas to:
  - Maintain the existing availability of services;
  - Maintain integrity of services; and
  - Comply with regulatory obligations or requirements.

1.1.6 Risk Assessment

If the SCADA upgrade is not carried out there is a risk of:

- Cessation of Vendor support;
- Applications becoming increasingly unstable;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure in older applications, resulting in unplanned production outages; and
- Major failure resulting in non-compliance with Retail Market Procedures.

The risk assessment for this Business Case is based on the APA document, Budget Planning for Stay in Business projects, Appendix B.

HAZARD NUMBER	HAZARD DESCRIPTION	HAZARD TREATMENT	HAZARD CLASSIFICATION	CONSEQUENCE							
				Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total	Priority
1	SCADA Upgrade	Risk Untreated	Likelihood	Rare	Possible	Possible	Rare	Possible	Possible		
			Consequence	Minor	Severe	Moderate	Minor	Moderate	Minor		
			Risk Level	Low	High	Moderate	Low	Moderate	Low		High
			Risk Score	1	13	8	1	8	4	35	2
		Risk Treated Option 1	Likelihood	Rare	Unlikely	Unlikely	Rare	Unlikely	Unlikely		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low	Low		Low
			Risk Score	1	2	2	1	2	2	10	1

Priority	Priority Description
1	Any project where the 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.
2	Any project where the Risk Level of at least one risk area falls into High must be included in Priority 2. These projects could expose APA to business damage.
3	Any project where the Risk Level of at least one risk area falls into Moderate must be included in Priority 3. These projects could affect reliability of assets, operating efficiency or compliance.
4	Any project where the Risk Level of at least one risk area falls into Low must be included in Priority 4. These projects could affect overall APA risk reduction and operating efficiency.

This project has been assessed as High risk and has been assigned a Priority of 2.

1.1.7 Justification

Consistent with the requirements of Rule 91, APT Allgas considers that the capital expenditure that it is seeking in order to address the APT Allgas' SCADA system upgrades would be:

- Prudent – the expenditure is necessary in order to maintain the integrity of services by ensuring:
  - Continuation of vendor support;
  - Security and integrity of business information;
  - Stability of systems; and
  - Compliance of systems.

  A stay in business program of work has been established to apply minor upgrades to critical business applications every three to four years. Three to four year duration is in line with prudent industry practise. If the SCADA system upgrade is not implemented there is a risk of:
  - The cessation of Vendor support;
  - Applications becoming increasingly unstable;
  - Inability to address strategic imperatives and architectural weaknesses;

- Increased rate of failure in older IT applications, resulting in unplanned production outages; and
- Major failure resulting in non-compliance of Retail Market Procedures.

- Efficient – APT Allgas has considered a number of options and undertaken a cost benefit analysis, where the project was selected on the basis of:
  - Being the only option to address the risks associated with the failure to upgrade the SCADA system;
  - Achieving a significant level of risk reduction as determined by the risk mitigation analysis detailed in Attachment B;
  - Allowing APT Allgas to:
    - Maintain the existing availability of services;
    - Maintain integrity of services; and
    - Comply with regulatory obligations or requirements.

In addition, the cost estimates for this project are based on the current schedule of rates with contractors selected through a public tender process. The proposed cost of this project is based on historic actual costs of similar projects.

For these reasons, the capital expenditure is considered efficient;

- Consistent with accepted and good industry practice – upgrading the SCADA system has been determined through risk analysis to be necessary on the basis that there is an extreme risk of non-compliance with regulatory obligations or requirements and a high risk of adverse financial, customer and business and reputation impacts as determined by the risk analysis. Additionally, the practice of applying minor upgrades to critical business applications every three to four years is in line with good industry practise. The recommended project will address this issue through the upgrade of six key IT applications. The recommended project has been assessed against alternative options – and is the only option to address the risks associated with the failure to upgrade critical business IT applications. On this basis, the capital expenditure is consistent with accepted and good industry practice; and

- Necessary to achieve the lowest sustainable cost of delivering pipeline services – the SCADA Upgrade project is necessary to maintain the integrity of services by ensuring:
  - Continuation of IT vendor support;
  - Security and integrity of business information;

- Stability of IT systems; and
- Compliance of IT systems.

- The need to upgrade the SCADA system has been identified, based on available information, with risk mitigation analysis showing there is an extreme risk of non-compliance with regulatory obligations or requirements and a high risk of adverse financial, customer and business and reputation impacts. The capital expenditure that APT Allgas is seeking is the only option assessed that fully addresses the identified risks. Additionally, the cost estimates for this project are based on the current schedule of rates with contractors selected through a public tender process. Actual material and direct labour costs, and applicable overhead charges, are based on historic actual costs of similar projects. On this basis, the additional expenditure is necessary to achieve the lowest sustainable cost of delivering the reference service.

In response to rule 79(1)(b), APT Allgas considers that the capital expenditure is justifiable under rule 79(2)(c)(ii) as the expenditure is necessary in order to maintain the integrity of services.

The recommended project will address the risks associated with a failure to upgrade the SCADA system, being:

- The cessation of Vendor support;
- Applications becoming increasingly unstable;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure in older IT applications, resulting in unplanned production outages; and
- Major failure resulting in non-compliance of Retail Market Procedures.

The risk associated with the failure to upgrade the SCADA system has been assessed as "High" and has been assigned Priority 2.

The recommended project is consistent with APT Allgas' practice of applying minor upgrades to critical business applications every three to four years, which is in line with good industry practice.

1.1.8 Step Change Not in Base Year Costs

Not applicable.

1.1.9 Project Delivery

APT Allgas confirms that it will use a combination of internal and external resources to deliver the recommended project. Work is to be undertaken by qualified contractors, sourced from trusted recruitment agencies based on specified requirements of skills and experience, supervised by internal personnel.

1.1.10 Consequences of Not Proceeding

If this project is not undertaken, then APT Allgas will:

- Be exposed to an extreme risk of non-compliance with regulatory obligations or requirements and a high risk of adverse financial, customer and business and reputation impacts.

The result of failure to upgrade the SCADA system may include:

- The cessation of Vendor support;
- Applications becoming increasingly unstable;
- Inability to address strategic imperatives and architectural weaknesses;
- Increased rate of failure in older IT applications, resulting in unplanned production outages; and
- Major failure resulting in non-compliance of Retail Market Procedures.

APT Allgas Energy Pty Limited

Opex Business Case
Non System Capex

Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100929 Opex Business Case_Non System Capex.doc

Contents

1.1 Non System Capex

1.1.1 Project Overview

It is planned to make provision for the expected costs of additional and replacement essential tools, equipment and other non system items.

The ability to replace tools, equipment and other non system items is necessary to:

- Ensure the safety of operatives and to comply with APT Allgas' Safety Non Negotiables, which refer to a set of requirements specified in APT Allgas' Health Safety and Environment Management System and the Workplace Health & Safety Act 1995
- Align with the objectives of the HSE legislation, which requires that APT Allgas issues and provides for the ongoing replacement of appropriate, fit for purpose tools and equipment.

This capital project assessment has been prepared in accordance with the methodology and requirements of APT Allgas' Asset Management Plan. ;

1.1.2 Background

The ongoing repair and maintenance of APT Allgas' network requires a substantial quantity of labour, vehicles, tools and equipment.

Project work uses a combination of contract and direct employees. Contractors provide all necessary resources to complete relevant tasks. However, direct labour must be supplied with the necessary vehicles, tools and equipment to carry out work. This may include:

- Gas detectors;
- Pressure recorders;
- Pipe locators;
- Concrete cutters;
- Compaction tools;
- Electrofusion equipment;
- Drills;
- Self contained breathing apparatus;

- Generators;
- Compressors; and
- Borers.

Other specialist equipment, such as:

- High Pressure Stopple/Hot Tap equipment;
- Electronic calibration tools; and welders.

may also be used by some employees.

A significant item of expenditure in this Access Submission is the capital required to replace stopple and hot tap equipment. The existing equipment is now nearly 20 years old, and has been refurbished several times. Highly stressed equipment such as this has a limited life, and is subject to fatigue failure. This is caused by the fluctuating stresses caused by the cyclical loading of the equipment. Fatigue failure can be difficult to detect prior to failure occuring. The age of the existing equipment, and the potentially catastrophic nature of failure should it occur, means that APT Allgas believes that it is prudent to commence a replacement program for the existing equipment.

The other major items of non-system capital proposed for purchase during the course of this Access Arrangement are two Remote Methane Leak Detectors, costing around $30K each. APT Allgas is keen to implement new and improved work practices in the operations of its networks. Currently, the leakage survey of services is difficult to perform, with more and more consumers opting for high security yards around their homes, guard dogs etc. The remote methane detectors will enable services and meter sets to be leak surveyed in the majority of instances from the nature strip outside residential front yards, thus making it unnecessary for leakage survey personnel to enter private property, or to make multiple visits to the property to achieve this aim. It is proposed to purchase two of these detectors initially in FY 11-12. Provision has been made for these units to be replaced after 3 to 4 years in the FY 14-15 and FY 15-16 budgets.

1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- There is an ongoing need to replace and provide additional essential tools, equipment and other non system items;
- Additional and replacement essential tools, equipment and other non reticulation items are necessary to ensure the safety of field operators and to comply with APT Allgas' Safety Non Negotiables;

- Additional and replacement essential tools, equipment and other non reticulation items are necessary to align with the objectives of the HSE legislation, which requires that APT Allgas issues and provides for the ongoing replacement of appropriate, fit for purpose tools and equipment;

- Additional and replacement essential tools, equipment and other non system items at current levels are necessary to maintain the integrity of services. Reduced expenditure may result in increased maintenance costs of existing equipment and failure to comply with HSE "fit for purpose" legislation requirements for tools and equipment;

- Without access to, or use of, a suitable tool in good repair there is an extremely high likelihood of a severe health and safety event; and

- The costs of providing for additional and replacement essential tools, equipment and other non system items have been based on: historical costs and maintaining the quantity and type of suitable tools, plant and equipment at current levels.

1.1.4 Costs & Timing

All costs are expressed in $2009/10 real.

The forecast costs of providing for additional and replacement essential tools, equipment and other non reticulation items have been based on:

- Historical costs; and

- Maintaining the quantity and type of suitable tools, plant and equipment at current levels.

Table **Error! No text of specified style in document.**-1 below, provides a breakdown of the forecast costs of expenditure on essential tools, equipment and other non reticulation items for the Access Arrangement period.

*Table **Error! No text of specified style in document.**-1: Non Reticulation Capital Expenditure*

$K (Real 2009/10)						
	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
Replacement Safety Equipment	20	20	40	20	20	**120**
Replacement Calibration Equipment	0	15	0	0	15	**30**
Stopple Equipment	85	85	85	15	15	**285**
Replacement Gas Detectors	0	15	15	0	0	**30**
Replacement Generators	0	15	0	0	15	**30**
New Battery Powered Electrofusion Units	15	0	0	15	0	**30**
Miscellaneous Small Tools	70	100	110	100	85	**465**
Remote Methane Leak Detectors	60	0	0	30	30	**120**
Office Furniture etc	20	20	20	20	20	**100**
Other	9	9	9	9	9	**45**
Total	**279**	**279**	**279**	**209**	**209**	**1,255**

1.1.5 Options Considered

Three main options were considered to address the ongoing requirements of essential tools, equipment and other non system items, being:

Establish a budget of $1.26m over the 2011-16 AA period;

Reduced expenditure; and

No replacement or purchase.

Each of these options is discussed in turn below.

***Option 1:** (Recommended) Establish budget of $1.26m over the 2011-16 AA period*

Cost estimate: $1.26m

Option 1 provides for the expenditure on essential tools, equipment and other non reticulation items to maintain current levels and satisfy current requirements.

In addition to the ongoing annual replacement costs associated with maintaining suitable tools, plant and equipment at current levels, it is proposed to:

- Purchase two remote methane leak detectors to improve the efficiency of leakage survey crews in surveying services. This would cost $60K during the year 2011-12 and would be repeated every four years; and

- Replace some of the stopple equipment, at a total cost of $210K, during the years 2012-14, as this equipment is currently 15 years old and is expected to be at the end of its serviceable life. Routine replacement of stopple equipment consumables and emergency spares, such as valves and cutters has been estimated to add an average $15K to the costs annually.

The $1.26m cost is intended to provide flexibility in purchases to cover the high cost individual items, detailed above, while also replacing smaller value equipment on an as needs basis.

The forecast cost of the project does not include expenditure on items such as desktop or laptop computers, office equipment or motor vehicles.

Option 2: *Reduced expenditure*

Cost estimate: less than $1.26m

Option 2 involves a lower level of expenditure, than estimated under option 1. Given that the cost of option 1 was based on maintaining the current levels of essential tools, equipment and other non system items, lower levels of expenditure may result in insufficient funds being available to provide the level of replacement necessary to maintain the integrity of services. This may result in increased maintenance costs of existing equipment and failure to comply with HSE "fit for purpose" legislation requirements for tools and equipment.

Option 3: *No replacement or purchase*

Cost Estimate: Nil

Option 3 is not considered acceptable from a safety or compliance perspective.

Cost Benefit Analysis

A cost benefit analysis has been undertaken on the options to address the ongoing expenditure requirements of essential tools, equipment and other non reticulation items. As a result:

- Option 3 is the least cost, but was not considered acceptable as it would result in the failure to comply with relevant safety and compliance legislation. The risk associated with option 3 has been determined as "Extreme" and assigned a Priority 1 level, as determined by the risk assessment detailed below;

- Option 1 is considered to provide the best solution to address the ongoing needs for essential tools, equipment and other non reticulation items. Option 1 would

involve maintaining necessary tools and equipment at current levels as well as additional equipment required and would satisfy current requirements. Option 1 is the only option that would minimise the risks associated with not maintaining the current levels and quality of essential tools, equipment and other non reticulation items as determined by the risk assessment detailed below; and

- Option 2 involves less cost than option 1, but may result in insufficient funds being available to provide the level of replacement necessary to maintain the integrity of services. This may result in increased maintenance costs of existing equipment and failure to comply with HSE "fit for purpose" legislation requirements for tools and equipment.

- Option 1 is the recommended option as it is the only option that:

  - Maintains the quality and quantity of essential tools, equipment and other non reticulation items at current levels;

  - Allows for compliance with relevant safety and compliance legislation; and

  - Minimises the risks associated with not maintaining the current levels and quality of essential tools, equipment and other non reticulation items as determined by the risk assessment detailed below.

1.1.6 Risk Assessment

Risk mitigation analysis has been carried out that shows there is an "High" risk of a severe health and safety event associated with not replacing essential tools, equipment and other non reticulation items and has been assigned Priority 2 in the risk matrix below.

HAZARD NUMBER	HAZARD DESCRIPTION	HAZARD TREATMENT	HAZARD CLASSIFICATION	CONSEQUENCE							
				Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total	Priority
1	Non-System Capex	Risk Untreated	Likelihood	Likely	Likely	Possible	Unlikely	Possible	Likely		
			Consequence	Severe	Moderate	Moderate	Moderate	Moderate	Severe		
			Risk Level	High	High	Moderate	Low	Moderate	High		High
			Risk Score	17	12	8	5	8	17	67	2
		Risk Treated Option 2	Likelihood	Possible	Possible	Unlikely	Rare	Unlikely	Possible		
			Consequence	Severe	Moderate	Minor	Moderate	Moderate	Severe		
			Risk Level	High	Moderate	Low	Low	Low	High		High
			Risk Score	13	8	2	3	5	13	44	2
		Risk Treated Option 1	Likelihood	Unlikely	Rare	Rare	Rare	Rare	Unlikely		
			Consequence	Severe	Moderate	Minor	Moderate	Moderate	Severe		
			Risk Level	Moderate	Low	Low	Low	Low	Moderate		Moderate
			Risk Score	9	3	1	3	3	9	28	3

Priority	Priority Description
1	Any project where the 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.
2	Any project where the Risk Level of at least one risk area falls into High must be included in Priority 2. These projects could expose APA to business damage.
3	Any project where the Risk Level of at least one risk area falls into Moderate must be included in Priority 3. These projects could affect reliability of assets, operating efficiency or compliance.
4	Any project where the Risk Level of at least one risk area falls into Low must be included in Priority 4. These projects could affect overall APA risk reduction and operating efficiency.

1.1.7 Justification

Consistent with the requirements of Rule 79(1)(a), APT Allgas considers that the additional $1.26m in capital expenditure that it is seeking in order to meet the ongoing requirements of essential tools, equipment and other non reticulation items is:

- Prudent – the expenditure is necessary in order to maintain the safety of services and to comply with regulatory obligations and requirements.

The project will provide the best solution to address the ongoing requirements for essential tools, equipment and other non system items. The project would allow current levels of necessary tools and equipment to be maintained over the Access Arrangement period. This project would allow for the continued compliance with HSE “fit for purpose” legislation requirements for tools and equipment. The health and safety risk associated with not replacing essential tools, equipment and other non reticulation items has been assessed as "Extreme”;

- Efficient – APT Allgas has considered a number of options and undertaken a cost benefit analysis, where the project was considered to be the only option that:

- Maintains the quality and quantity of essential tools, equipment and other non system items at current levels;

- Allows for compliance with relevant safety and compliance legislation; and

- Minimises the risks associated with not maintaining the current levels and quality of essential tools and equipment.

The cost estimate for this project is based on historical costs and maintaining the quantity and type of suitable tools, plant and equipment at current levels. For these reasons, $1.26m in capital expenditure is considered efficient;

- Consistent with accepted and good industry practice – It is necessary for proper tools and equipment to be available to maintain the Network. These tools are often specialist in nature. The costs associated with this project have been determined based on historical costs and maintaining the quantity and type of suitable tools, plant and equipment at current levels. This project has been assessed against alternative options whereby lower levels of expenditure have been determined to carry potentially high residual risks, including potentially extreme risks of health and safety events and non compliance with relevant legislative requirements. On this basis, $1.26m in capital expenditure is consistent with accepted and good industry practice; and

- Necessary to achieve the lowest sustainable cost of delivering pipeline services – the non system capital project is necessary to maintain the safety of services of APT Allgas' network. The need to maintain the safety of services has been identified, based on available information, with risk mitigation analysis showing there is an extreme risk of a severe health and safety event should essential tools, equipment and other non reticulation items not be replaced. The $1.26m in capital expenditure that APT Allgas is seeking is based on historical costs and maintaining the quantity and type of suitable tools, plant and equipment at current levels. On this basis, the expenditure is necessary to achieve the lowest sustainable cost of delivering the reference service.

In response to Rule 79(1)(b), APT Allgas considers that $1.26m in capital expenditure is justifiable over the next access arrangement period under Rule 79(2)(c)(i) and(iii) as the expenditure is necessary in order to maintain the safety of services and comply with the objectives of the HSE legislation, which requires that APT Allgas issues and provides for the ongoing levels of appropriate fit for purpose tools and equipment.

The recommended project will address the safety of services risks associated with maintaining current levels of essential tools, equipment and other non system items. The health and safety risk of not replacing essential tools, equipment and other non system items has been assessed as high and without the forecast level of expenditure significant residual risk will remain.

The forecast expenditure will:

- Ensure the safety of operatives and to comply with APT Allgas' Safety Non Negotiables, which refer to a set of requirements specified in APT Allgas' HSE Management System;
- Allow for compliance with HSE legislation, which requires that APT Allgas issues and provides for the ongoing replacement of appropriate fit for purpose tools and equipment.

1.1.8 Step Change Not in Base Year Costs

N/A.

1.1.9 Project Delivery

The replacement of essential tools, equipment and other non system items will occur as required and in accordance with APT Allgas' internal policies and procedures.

1.1.10 Consequences of Not Proceeding

If this project is not undertaken, then APT Allgas will:

- Be exposed to a material risk of a potentially severe health and safety event;
- Not have the necessary equipment to maintain the integrity of services;
- Potentially fail to comply with APT Allgas' Safety Non Negotiables, which refer to a set of requirements specified in APT Allgas' HSE Management System, and HSE legislation, which requires that APT Allgas issues and provides for the ongoing replacement of appropriate fit for purpose tools and equipment; and
- Need to divert expenditure from other necessary projects which will have a detrimental effect on APT Allgas' overall service delivery.

APT Allgas Energy Pty Limited

Opex Business Case
Cocon Lid Replacement
Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100909 - Opex Business Case - Cocon Lid Replacement.doc

Contents

1.1 Cocon Lid Replacement

1.1.1 Project Overview

This project presents a strategy for planned replacement of lightweight lids on Cocon District Regulator Stations. The original lids installed on these stations have been found to be inadequate to cope with loadings being typically experienced. Plastic deformation of the lids has been occuring. This has resulted in ingress of water and contaminants into the regulator stations, particularly in adverse weather conditions. In addition the buckled lids are a potential trip hazard to the general public.

It is proposed to replace these light duty lids with redesigned lids, which are capable of withstanding the required loadings. There are currently 30 installations of this type requiring lid replacement.

1.1.2 Background

Cocon district regulator stations were installed in the APT Allgas network in high gas flow, high traffic areas where district regulator stations to APT Allgas' standard designs were unsuitable for installation.

Cocon regulators are imported from Holland. They are used extensively in Europe. They are also relatively expensive. In an effort to reduce the initial cost of these regulators, the original heavy duty cast iron gatic-style lid was replaced by the local supplier with a lightweight, fabricated lid, held in place by countersunk set screws in the top of the lid. While this achieved the objective of reducing costs, it was subsequently found that the lightweight was subject to plastic deformation when heavily loaded.

Cocon regulators may be placed in areas subject to vehicular traffic. This means that from time to time they may be heavily loaded, which results in plastic deformation of the lid. The unfortunate upshot of this is that many of the lids now leak, allowing water and dirt to enter the Cocon casing. This is significantly increasing corrosion of this equipment, and resulting in increased maintenance costs. In addition, the warped lids present a tripping hazard to the general public.

A redesign of the lids is required which can replace the existing lids with new lids capable of withstanding, without plastic deformation, the high traffic loads encountered by this equipment.

There are a total of 30 regulators in this configuration requiring modification.

1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- The existing lightweight Cocon lids are unsatisfactory as they plastically deform when heavily loaded, which allows the following undesirable consequences:
  - Contaminants entering the regulator station;
  - Formation of a trip hazard to the general public;
  - Easier access to the regulator station to those with ill intent;
  - Possible complete failure under load.
- Replacement of the existing lids with appropriately redesigned lids will allow all these potential hazards to be eliminated.

1.1.4 Costs & Timing

All costs are expressed in $2009/10 real and exclude overheads.

DRS Lid Replacement – ($K Real 2009/10)						
	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
DRS Lid Replacement	44	20	18	0	0	82
Total	**44**	**20**	**18**	**0**	**0**	**82**

It is planned to redesign the existing lightweight lids and complete the remaining installations under this project.

The costs of this project are based on developing an appropriate design, manufacture fitting and testing of a prototype, and manufacture and fitting of new lids for all affected installations. This may involve excavating around each current installation, removing the existing lids, installing new lids and supporting structures, and reinstating the surrounding concrete.

Design and prototyping costs are included in FY12, with installation costs included in FYs 12,13 and 14.

Costs for this project include analysis of the existing lids, design of a new lid/seal arrangement, manufacture, installation and testing of a prototype installation, and subsequent manufacture and replacement of all lightweight lids. This work is estimated to be $16K for the analysis and redesign, $8K for manufacture, installation and testing of the prototype, and $2K per site for manufacture, supply and fit of the final installation. This project involves replacing the lids at 30 sites that present the highest risk.

Total OPEX Cost: $82K

1.1.5 Options Considered

Option 1 Redesign and replace the lightweight lids with a redesigned lid capable of withstanding required loadings (Recommended)

The current designed lids are bolted to the regulator casing using stainless steel, countersunk set screws. These screws allow ingress of dirt and water into the regulator housing unless a perfect fit is maintained between the screw countersink and the lid. This becomes impossible when the lids are subjected to loads sufficient to cause plastic deformation.

Lids for the Cocons are originally designed to fit flush with the ground. Warped lids caused by the plastic deformation present raised edges which are a tripping hazard for pedestrians.

This option includes analysis of the existing lids, design of a new lid/seal arrangement, manufacture, installation and testing of a prototype installation, and subsequent manufacture and replacement of all lightweight lids.

Option 2 Do nothing - Reactive maintenance in response to failure

This is not recommended due to the risk to the public (see Section 6).

1.1.6 Risk Assessment

Failure to improve the district regulator stations places at risk the safety of the general public, the supply and the integrity of network assets, and has financial implications for APT Allgas in the form of increased maintenance costs.

This project has been assessed using the APT Allgas risk matrix as follows.

HAZARD NUMBER	HAZARD DESCRIPTION	HAZARD TREATMENT	HAZARD CLASSIFICATION	CONSEQUENCE							
				Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total	Priority
1	Trip Hazard	Risk Untreated	Likelihood	Likely	Possible	Rare	Rare	Possible	Possible		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Moderate	Low	Low	Low	Low	Low		Moderate
			Risk Score	7	4	1	1	4	4	21	3
		Risk Treated	Likelihood	Rare	Rare	Rare	Rare	Rare	Rare		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low	Low		Low
			Risk Score	1	1	1	1	1	1	6	
2	Increased Maintenance Requirements	Risk Untreated	Likelihood	Likely	Almost Certain	Possible	Almost Certain	Possible	Possible		
			Consequence	Moderate	Minor	Moderate	Minor	Minor	Minor		
			Risk Level	High	Moderate	Moderate	Moderate	Low	Low		High
			Risk Score	12	11	8	11	4	4	50	2
		Risk Treated	Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Rare	Unlikely		
			Consequence	Moderate	Minor	Moderate	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low	Low		Low
			Risk Score	5	2	5	2	1	2	17	
3	Increased Access for Vandalism	Risk Untreated	Likelihood	Likely	Likely	Possible	Possible	Possible	Possible		
			Consequence	Minor	Minor	Moderate	Minor	Minor	Minor		
			Risk Level	Moderate	Moderate	Moderate	Low	Low	Low		Moderate
			Risk Score	7	7	8	4	4	4	34	3
		Risk Treated	Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely		
			Consequence	Minor	Minor	Moderate	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low	Low		Low
			Risk Score	2	2	5	2	2	2	15	
4	Vehicle Penetration of Lid	Risk Untreated	Likelihood	Possible	Possible	Possible	Possible	Unlikely	Possible		
			Consequence	Moderate	Minor	Moderate	Moderate	Minor	Moderate		
			Risk Level	Moderate	Low	Moderate	Moderate	Low	Moderate		Moderate
			Risk Score	8	4	8	4	2	8	34	3
		Risk Treated	Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely		
			Consequence	Moderate	Minor	Moderate	Moderate	Minor	Moderate		
			Risk Level	Low	Low	Low	Low	Low	Low		Low
			Risk Score	5	2	5	5	2	5	24	

Priority	Priority Description
1	Any project where the 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.
2	Any project where the Risk Level of at least one risk area falls into High must be included in Priority 2. These projects could expose APA to business damage.
3	Any project where the Risk Level of at least one risk area falls into Moderate must be included in Priority 3. These projects could affect reliability of assets, operating efficiency or compliance.
4	Any project where the Risk Level of at least one risk area falls into Low must be included in Priority 4. These projects could affect overall APA risk reduction and operating efficiency.

This project has been assessed as High risk, and has been assigned Priority 2.

1.1.7 Justification

The benefits of the planned strategy are summarised as follows:

- Reducing the ongoing maintenance costs of the Cocon regulators by reducing corrosion and dirt build-up in the housing;
- Eliminating the trip hazard to the general public;
- Reducing the ease with which vandals can access the regulator station controls;
- Reducing the possibility of vehicle penetration of the Cocon lid.

This expenditure complies with Rule 79(2)c(i) and (ii). That is, it is necessary to:

- Maintain & improve the safety of services
- Maintain the integrity of services

1.1.8 Step Change Not in Base Year Costs

APT Allgas confirms that the additional $82K in operating expenditure associated with this proposal is not included in the base year costs for 2008/09.

1.1.9 Project Delivery

APT Allgas confirms that a combination of internal and external resources will be used to undertake this project.

1.1.10 Consequences of Not Proceeding

As identified in the risk assessment, the consequences of not proceeding with this project are:

- Ongoing higher than necessary maintenance costs associated with this equipment
- Failure to fix a tripping hazard to the general public;
- Easier access to regulator station controls by vandals;

Failure of a lid under load.

APT Allgas Energy Pty Limited

Extension of Leakage Survey Program

Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100929 - Opex Business Case - Extension of Leakage Survey Program.doc

Contents

1.1 Extension of Leakage Survey Program

1.1.1 Project Overview

The gas industry throughout Australia regularly performs leakage survey on it's assets to ensure that gas leaks are detected, assessed, and appropriate action taken. This is done to both mitigate the risks associated with leaking gas, and to manage the volume of gas lost to leakage.

APT Allgas has traditionally performed regular programmed leakage survey on all pipelines and mains on a five year basis, and designated high risk areas on a 1 year basis. Consumer services are not currently leakage surveyed, despite these being considered part of the network under Queensland's Petroleum & Gas Regulations.

A recent trial found higher than expected numbers of leaks both on services and on meter sets. As a result of this, it is now proposed to implement a restricted program of leakage survey on consumer services. This program would be restricted only to medium pressure and low pressure areas of APT Allgas' distribution network.

1.1.2 Background

The gas industry throughout Australia regularly performs leakage survey on it's assets to ensure that gas leaks are detected, assessed, and appropriate action taken. This is done to both mitigate the risks associated with leaking gas, and to manage the volume of gas lost to leakage.

APT Allgas has traditionally performed regular programmed leakage survey on all pipelines and mains on a five year basis, and designated high risk areas on a 1 year basis.

The Queensland Petroleum & Gas Regulation, Chapter 5, Part 1, Division 1, states "The operator of a fuel network must take all reasonable and necessary steps to ensure that fuel gas does not leak from ….. any part of the network". This Regulation defines a fuel gas network in Schedule 12, as "a distribution system, including meters and meter regulators whether or not they are owned by the operator of the distribution system". This means that under Queensland law, APT Allgas is responsible for ensuring it takes all reasonable and necessary steps to ensure fuel gas does not leak from any part of its network, including the mains, services and meters.

AS4645:2008, requires network operators to perform leakage surveys with a frequency based on the formal safety assessment (FSA) for the network.

Consumers' services on the APT Allgas network are not currently leakage surveyed, apart from some major services which operate at high pressure. The main reason

for this omission is the difficulty in accessing consumers' services, with more gated communities, security fences and gates, and large dogs.

APT Allgas has recently conducted a trial in Toowoomba, in which a large number of services were leakage surveyed. The results of this survey found higher than expected numbers of leaks both on services and on meter sets.

As a result of the survey finding, it is now proposed to implement a restricted program of leakage survey on consumers' meters and services, by including leakage survey of meters and services as an adjunct to the mains leakage survey program. This program would be carried out only in designated areas. Designated areas would initially be restricted to low and medium pressure areas of APT Allgas' distribution network. Areas where high concentrations of Philmac fittings are thought to exist would also be targeted.

APT Allgas proposes to carry out this leakage survey of meters and services using remote methane leak detectors, the use of which permits operators to reliably detect leaks for a distance of 30 metres. Provision for these detectors has been included in the Non-System Capex Business Case. This remote detection means that operators no longer need access consumer premises. This overcomes the previous main obstacle to performing leakage surveys of meters and services.

Based on the findings of the trial program, it is expected that the number of leaks detected and requiring repair will increase substantially over the number repaired in the base year (2009-10) used for this Access Arrangement submission. Assessment and repair of the anticipated leaks detected as part of this program will result in additional Opex costs for APT Allgas.

1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- The Queensland Petroleum and Gas Regulation 2004 clearly makes APT Allgas responsible for ensuring that leaks on all parts of the APT Allgas network are minimised;
- AS 4645 requires that the frequency of leakage survey be based on the FSA for the network;
- The results of a trial program indicate that a significant number of currently undetected leaks are expected to be found. These leaks will be additional to the leaks found in the base year;
- Designated low and medium pressure areas to be included in the leakage survey program are predominantly constructed from cast iron, unprotected steel and PVC, all of which are now in excess of 25 years old.

- With the small length of mains replacement being completed each year, services of this type of construction are likely to continue to be in service for an extended period.

1.1.4 Costs & Timing

The cost of establishing a leakage survey program for consumers' services is set out below. It is proposed to establish this program so that surveys of designated are carried out every five years. All costs are expressed in $2010/11 real.

*Table **Error! No text of specified style in document.**-1Cost of Pipeline Integrity Inspection per Casing*

ADDITIONAL COST OF SERVICE LEAKAGE SURVEY $K (Real 2009/10)						
	2011-12	2012-13	2013-14	2014-15	2015-16	**Total**
Additional leakage survey costs	40	40	40	40	40	**200**
Additional meter repair costs	27	27	27	27	27	**135**
Additional service leak repairs	127	127	127	127	127	**635**
Additional Philmac repairs	358	331	306	282	261	**1,538**
Total Cost	**552**	**525**	**500**	**476**	**455**	**2,508**

1.1.5 Options Considered

Three options were considered to address the identified risks associated with undetected leaks on services and meters. These were:

- Perform leakage survey five yearly on all services and meter sets;
- Perform leakage survey five yearly on the higher risk services and meter sets which are constructed with materials of lower leakage integrity;
- Do nothing and accept the risk.

Option 1: Perform leakage survey five yearly on all services and meter sets

Cost Estimate: $3.5M

This option involves the leakage survey of all services of the network every 5 years.

Costs with this option are considerably higher than with the recommended option.

The majority of the incremental costs of this option over those of option 2 are due to the costs of leakage survey, rather than leak repair. Numbers of leaks expected to be located on meters would be expected to be proportional to the number of meters surveyed. However, the numbers of leaks detected on the services is expected to be only marginally higher. This is because all the additional services surveyed would be PE.

Although this is the most conservative option, it does not represent as good value as the recommended option.

Option 2: (Recommended) Perform leakage survey five yearly on designated services and meter sets

Cost Estimate: $2.5M

This option involves the leakage survey of designated meters and services on the network every 5 years. Designated services will be services in low and medium pressure areas. Low and medium pressure areas are characterised by mains primarily constructed from cast iron or unprotected steel, both of which are noted for high leakage rates.

The majority of the costs of this option are due to the costs of leak repair on the services, with the cost of leakage survey itself being fairly low in proportion. This means that this option represents high efficiency in terms of numbers of leaks detected per dollar of leakage survey costs.

Although this is not the most conservative option, it does represent improved value over that in option 1, while complying with the spirit of the legislation and AS 4645, while managing the leaks.

Option 3: Do Nothing – Accept the Risk

This option would require an acceptance of the existing risks, dealing with potential leaks on a reactive basis, and detecting gas escapes before they become a risk to the community.

Given the age and condition of the meters and services in the proposed designated areas, and the extension of the mains replacement program to over 18 years, the probability of occurrence of large numbers of leaks is high. While most leaks are not particularly dangerous, any leak has the potential to result in a dangerous situation given the right conditions.

It is therefore considered prudent, that APT Allgas, given this knowledge of the probability of potentially high leakage densities, takes appropriate action to mitigate the associated risks.

1.1.6 Risk Assessment

The risk assessment for this Business Case is based on the APT Allgas document, Budget Planning for Stay in Business projects, Appendix B.

HAZARD NUMBER	HAZARD DESCRIPTION	HAZARD TREATMENT	HAZARD CLASSIFICATION	CONSEQUENCE							
				Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total	Priority
1	Leak in service or meter	Risk Untreated	Likelihood	Likely	Likely	Likely	Almost Certain	Rare	Likely		
			Consequence	Moderate	Minor	Minor	Minor	Minor	Moderate		
			Risk Level	High	Moderate	Moderate	Moderate	Low	High		High
			Risk Score	12	7	7	11	1	12	50	2
		Risk Treated	Likelihood	Unlikely	Unlikely	Unlikely	Likely	Rare	Unlikely		
			Consequence	Moderate	Minor	Minor	Minor	Minor	Moderate		
			Risk Level	Low	Low	Low	Moderate	Low	Low		Moderate
			Risk Score	5	2	2	7	1	5	22	3

Priority	Priority Description
1	Any project where the 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.
2	Any project where the Risk Level of at least one risk area falls into High must be included in Priority 2. These projects could expose APA to business damage.
3	Any project where the Risk Level of at least one risk area falls into Moderate must be included in Priority 3. These projects could affect reliability of assets, operating efficiency or compliance.
4	Any project where the Risk Level of at least one risk area falls into Low must be included in Priority 4. These projects could affect overall APA risk reduction and operating efficiency.

This project has been assessed as high risk and has been assigned a Priority of 2.

1.1.7 Justification

APT Allgas considers that the additional operating expenditure that it is seeking in order to address the leakage survey and leak repair requirements of meters and services in designated higher risk areas is both prudent and efficient.

The expenditure is considered prudent is it significantly reduces the risks associated with these sites.

It is important that these services are monitored regularly to ensure their ongoing integrity. If this does not occur effectively, a potential for fire or explosion exists.

The expenditure is considered by APT Allgas to be efficient, as this approach maximises the likelihood of leakage detection for the cost associated with this leakage survey activity.

1.1.8 Step Change Not in Base Year Costs

APT Allgas confirms that the additional $552K in operating expenditure associated with this proposal is not included in the base year costs for 2009/10.

1.1.9 Project Delivery

APT Allgas confirms that a combination of internal and external resources will be used to undertake this project.

1.1.10 Consequences of Not Proceeding

If this project is not undertaken, APT Allgas will be operating at a higher than reasonable level of risk.

APT Allgas Energy Pty Limited

Unaccounted For Gas

Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100909 - Opex Business Case - UAG.doc

Contents

1.1 Unaccounted for Gas

1.1.1 Project Overview

This business case explains the forecast cost of unaccounted for gas (UAG) on the APT Allgas network.

UAG is generally defined as the difference between the volume of gas injected into a gas distribution system less the volume of gas billed to the consumers.

UAG may be attributable to a variety of factors, the relative importance of which is specific to individual network attributes. Some of the more common factors are, leakage from mains and services, metering errors, misappropriation of gas, system processing errors, telemetry errors, and gas lost due to damages.

This business case discusses the relative contribution of these factors to UAG on the APT Allgas network.

1.1.2 Background

Historically, UAG on the APT Allgas network has been around 4-6% of gas injections. As a result of concentrated efforts to reduce this, and largely due to the effects of the mains renewal program, APT Allgas was able to reduce the level of UAG on its network from 5% in 2000 to around 3.5% in 2005. This rate of decline was reflected in APT Allgas' 2006 Access Determination by the Queensland Competition Authority.

Table **Error! No text of specified style in document.**-1 below, shows the UAG permitted in APT Allgas' 2006 Access Determination.

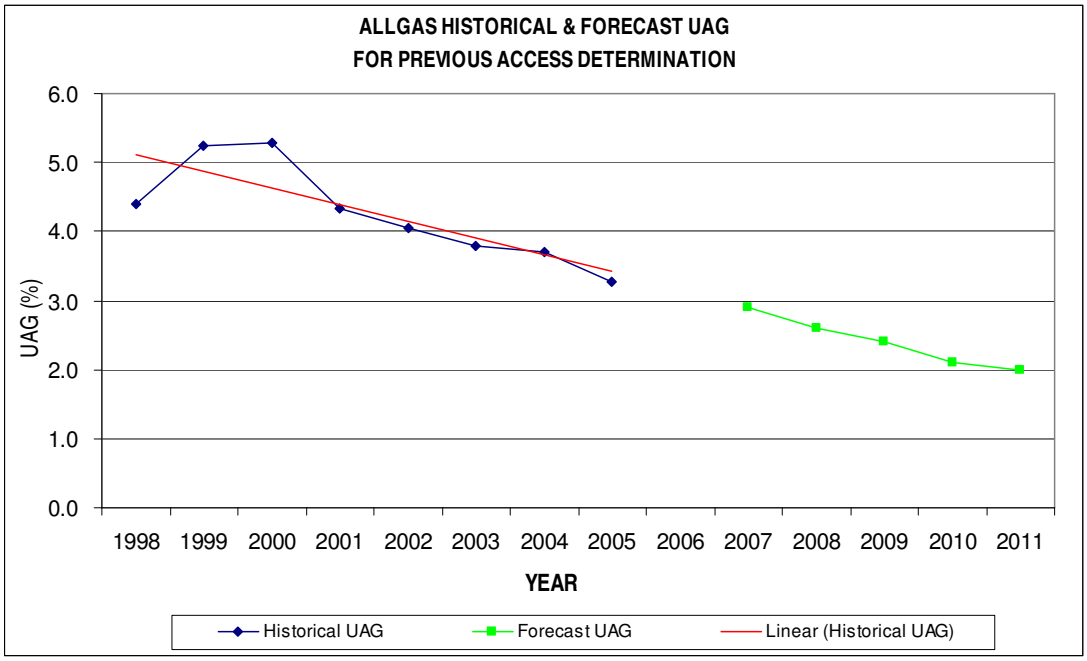
*Table **Error! No text of specified style in document.**-1Forecast UAG, 2007 - 2011*

FORECAST UAG, 2007 - 2011 ($m nominal)					
Year	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**
UAG Value ($m)	1.5	1.4	1.4	1.3	1.3
Unit UAG Cost ($/GJ)	5.00	5.19	5.37	5.56	5.75
UAG (TJ)	300	270	261	234	226
Gas Injections (TJ)	10,338	10,534	10,774	10,962	11,190

UAG Volume (%)	2.9	2.6	2.4	2.1	2.0

The level of UAG, expressed as a percentage of gas injections, is shown graphically below.

Figure 1: APT Allgas Historical & Forecast UAG for Previous Access Determination



It can be seen from this that in determining an appropriate level of UAG on the APT Allgas distribution network, it was assumed that the historical downward trend would be continued while the mains renewal program continued, which occurred for almost the full term of the ensuing access arrangement.

However, the decline in UAG did not continue as originally predicted Table **Error! No text of specified style in document.**-2 shown below, details the achieved level of UAG on the APT Allgas network for the 2006 Access Determination period, expressed as a percentage of gas injections.

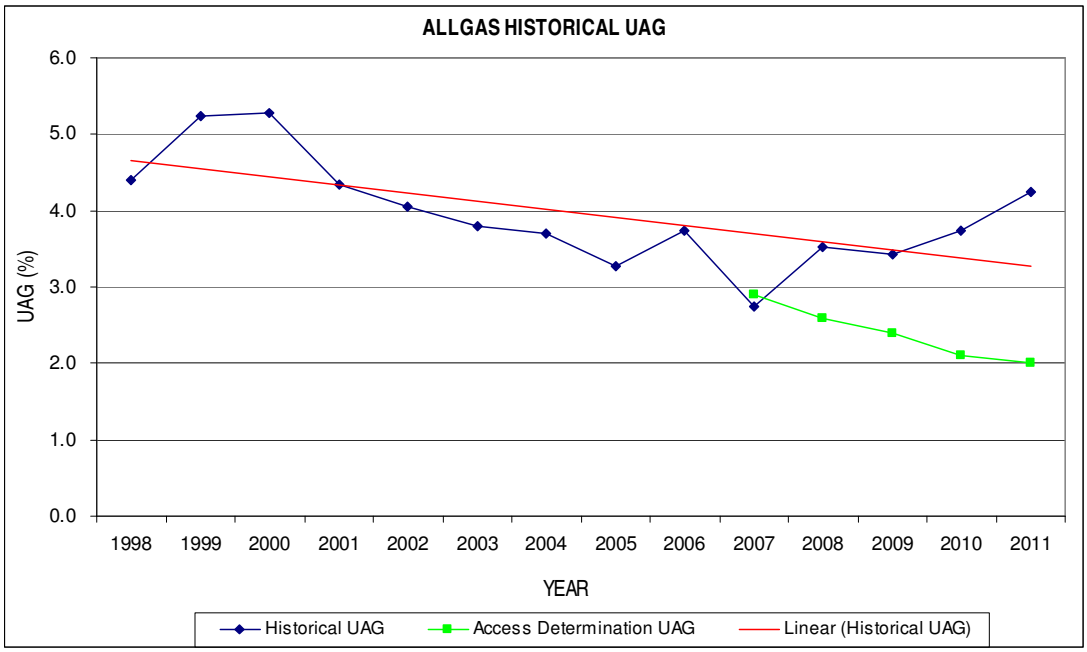
*Table **Error! No text of specified style in document.**-2Historical UAG on the APT Allgas Network*

HISTORICAL UAG ON THE APT Allgas NETWORK (%)												
Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010

UAG (%)	4.4	5.2	5.3	4.3	4.1	3.8	3.7	3.3	3.7	2.7	3.5	3.4	3.4

This data is shown graphically below.

Figure 2 APT Allgas Historical UAG



It can be seen from this that the overall downward trend of UAG has not been sustained.

APT Allgas calculates that the overall level of UAG on its network for the 2010 financial year is 3.8%.

This variation between forecast and actual UAG on the APT Allgas network may primarily be attributed to three factors. They are:

- The linear extrapolation of the rate of reduction of UAG was an unreliable indicator of trend in the level of UAG over the 2006-11 AA period, because it over-emphasised the contribution of mains renewal program to reductions in the overall level of UAG;

- The sale of the APT Allgas network by Energex to APA Group was unknown at the time of the previous Access Arrangement. Therefore, due accord by any party was not taken of the disruption this would cause to the APT Allgas business, and in particular capital expenditure, with the subsequent postponement of mains replacement expenditure as APA Group assessed and planned the future direction of the APT Allgas business;

- As part of the move to Full Retail Contestability, APT Allgas installed new metering and telemetry equipment on major. Problems were experienced with the equipment at the metering/telemetry interface which were not immediately detected.

APT Allgas submits that the level of UAG in the 2006-11 Access Arrangement was lower than could reasonably be achieved in the given conditions.

Notwithstanding the above, APT Allgas maintains that UAG on it's networks has remained within an efficient range, and, as demonstrated in the Table **Error! No text of specified style in document.**-3 below, is comparable with other utilities with similar network characteristics.

*Table **Error! No text of specified style in document.**-3 Benchmark APT Allgas UAG*

BENCHMARK APT Allgas UAG					
	APT Allgas (Qld)	Envestra (Qld)	ActewAGL (ACT)	Jemena (NSW)	Multinet (Vic)
UAG (GJ/km Mains)	142	46	33	96	191
CI & Other Mains (%)	18	17	0	2	16

The unit GJ/km Mains has been deliberately chosen rather than the traditional UAG percentage of gas delivered as the unit of benchmarking. This has been done to compensate for the relatively low gas volumes delivered per kilometre of mains in the Queensland networks compared to Southern states. In choosing this measure, it is acknowledged that leakage from mains and services is not the only component of UAG, but that while a significant length of cast iron and other non-plastic mains exist on the APT Allgas network, leakage from mains and services is a significant contributor to UAG. The length of cast iron and other non-plastic mains in each of the benchmarked networks has been provided to allow a more meaningful comparison to be made.

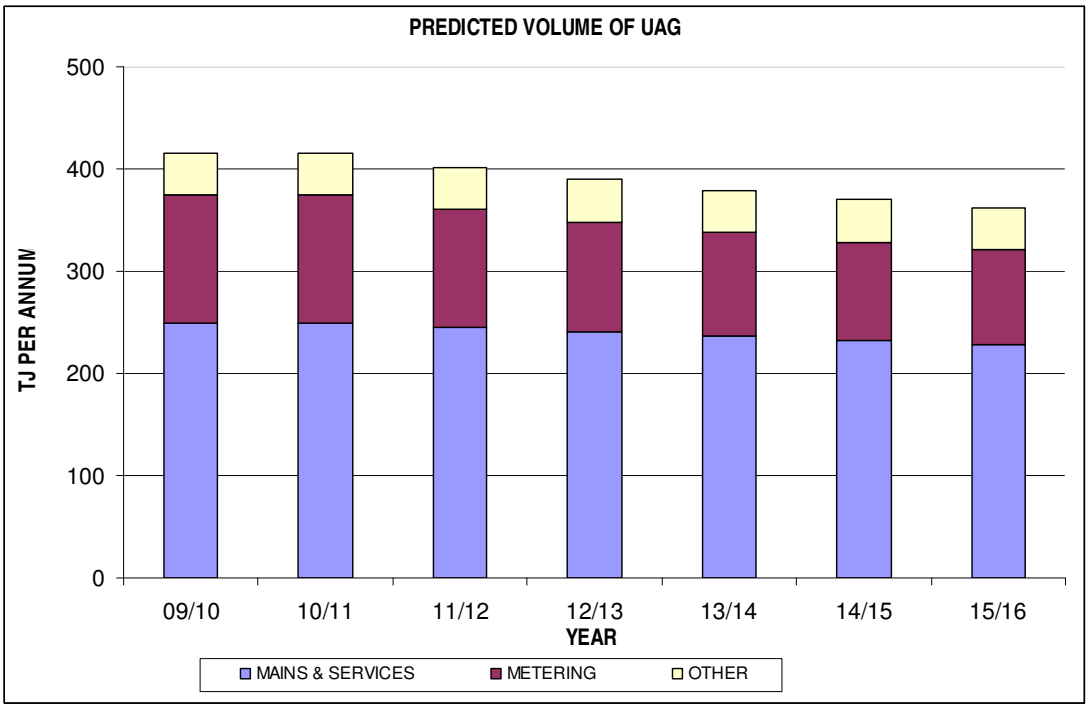
Analysis has shown that leakage and therefore UAG from old cast iron and unprotected steel mains is significantly higher than leakage from new, plastic networks. The proposed mains replacement program will result in a decrease in the length of cast iron and unprotected steel mains on the APT Allgas network. This will result in reduced leakage from the network.

However, leakage from mains and services is only one cause of UAG. UAG may also occur as a result of metering errors, misappropriation of gas, system processing errors, telemetry errors, damages, etc. This means that any reduction in leakage from mains and services is unlikely to be directly proportional to reductions in UAG.

APT Allgas calculates that at its current level of UAG of 416TJ p.a., 175TJ p.a. may be attributed to leakage from cast iron and unprotected steel mains and services, and Philmac fittings on its network. Of this, approximately 65TJ is due to cast iron and unprotected steel mains and services. It is this latter figure which will be reduced directly as a result of the mains replacement program.

The volume of UAG calculated for this Access Submission has therefore been adjusted annually during this Access Arrangement period, in accordance with the predicted decrease in the length of cast iron and unprotected steel mains and services resulting from the proposed mains renewal program. This is shown in Figure 3 below.

Figure 3 Predicted Volume of UAG



1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the predicted volume of UAG are:

- Continuation of the mains renewal program at the levels nominated in this Access Submission;
- Approval for expenditure to appoint a Revenue Protection Officer to continually oversee revenue and UAG issues (see separate Business Case).

1.1.4 Costs & Timing

All costs are expressed in $2009/10 real.

APT Allgas has decided to apply for cost increases of purchased gas aligned to the 2010 Annual Gas Market Review, prepared for the Queensland Department of Employment, Economic Development and Innovation by McLennan, Magasanik Associates Pty Ltd[1]. Should the actual costs incurred by APT Allgas significantly exceed the prices used in this Submission, then APT Allgas proposes to apply to the AER for a pass through mechanism for the difference. APT Allgas feels that this approach is the most likely to provide a fair and equitable outcome to all stakeholders.

Table **Error! No text of specified style in document.**-4 details the proposed costs for purchased gas and the cost of UAG over the 2011-16 AA period.

*Table **Error! No text of specified style in document.**-4: Forecast Costs of Purchased Gas*

UAG COSTS ($ Real 2009/10)							
	2010	2011	2012	2013	2014	2015	2016
Purchased Gas ($/GJ)	5.56	5.64	5.93	6.43	7.31	7.44	7.50
Total Costs ($m)	2.25	2.45	2.53	2.66	2.94	2.92	2.88

1.1.5 Options Considered

N/A

1.1.6 Risk Assessment

N/A

1.1.7 Justification

N/A

[1] McLennan Magasanik Associates, *Report to DEEDI, Annual Gas Market Review*, 23 June 2010, , Ref J1891

1.1.8 Step Change Not in Base Year Costs

N/A.

1.1.9 Project Delivery

N/A

1.1.10 Consequences of Not Proceeding

N/A

APT Allgas Energy Pty Limited

Condition monitoring of Cased Pipelines

Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100929 - Opex Business Case - Condition Monitoring of Cased Pipelines.doc

Contents

1.1 Condition Monitoring of Cased Pipelines

1.1.1 Project Overview

In 2007, APT Allgas carried out an investigation of steel pipelines and mains in cased crossings. The report from this investigation documented the extent of the problem, and recommended regular inspections of all affected sites. Although partial implementation of these recommendations occurred, they have not been fully implemented due to resourcing constraints.

APT Allgas currently has 297 instances of this type of installation on its network.

Recent APT Allgas experience has demonstrated the importance of full implementation of the report's recommendations to maintain the integrity of steel pipelines and gas mains in casings.

The problem with steel pipelines in casings occurs because of a combination of previous installation practices which damaged pipeline coating systems during installation, and a lack of cathodic protection within the casing.

This proposal seeks to increase the monitoring program for cased steel pipelines, in accordance with the Report's recommendations, to ensure the ongoing integrity of the affected pipeline. The knowledge gained from this monitoring program will enable APT Allgas to take timely and appropriate action to prevent uncontrolled and potentially catastrophic failure of the affected sites on the APT Allgas network.

This program is important because a leak from a pipeline within a sleeved crossing could impact the safety of the public and affect security of supply to a large number of consumers.

1.1.2 Background

There are approximately 300 locations, within the APT Allgas distribution networks where steel pipelines have been laid inside steel or plastic casings. Table **Error! No text of specified style in document.**-1 below summarises the number of crossings by type of carrier pipe and pressure regime.

*Table **Error! No text of specified style in document.**-1: APT Allgas Cased Steel Pipelines*

APT Allgas CASED STEEL PIPELINES				
	Casing Material			
Pressure Regime	**Steel/CI**	**PE/PVC**	**Unknown**	**Total**
Class 600	14	2	9	**25**
Class 300	33	104	4	**141**
HPS	24	70	37	**131**
Total	**71**	**176**	**50**	**297**

A review of these cased crossings was carried out in 2006 to determine an appropriate course of action going forward. This review recommended that a sample program be carried out, and dependant on the results of this program, that a regular inspection program be introduced, and pipelines passing through casings be replaced as deemed necessary. The sample program was carried out with the following conclusions:

- Cathodic protection cannot be achieved on the carrier pipe in cased steel pipelines;
- Casings should not be used unless required by another authority,
- Casings should never be plastic,
- Corrosion of cased steel gas mains cannot be ruled out as a potential risk to the APT Allgas network, and;
- Based on the relative risk assessment performed in the Maintenance and Operating Plan, corrosion of cased steel low and medium pressure gas mains is not likely to rate as an immediate extreme risk.

The review recommended the following actions be carried out:

- All steel casings with CP test points or vent pipes should be checked as part of the 6 monthly CP survey to determine if metallic contact between gas main and casing exists;
- Further sample testing of cased gas mains should be carried out until the risk assessment deems corrosion in cased steel gas mains to be a sufficiently low risk.

These first of these recommendations has been carried out as part of the regular CP inspection program. However, the second recommendation has not been carried out to date due to lack of resources.

APT Allgas proposes to continue the program where all cased steel pipelines are tested every 6 months as part of the CP survey program, and to commence a five yearly inspection program to identify potential failure sites on the carrier pipe within the sleeve. The buried location of these sites means that dig ups will be required. This means that inspection and maintenance activities will be time consuming and costly. However, this cost will be less than the alternative, which is to replace all cased steel mains and pipelines.

The use of casings on coated steel mains and pipelines is an out-dated practice which is only used by APT Allgas in exceptional circumstances.

1.1.3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- AS 2885 calls for the use of steel main, direct buried, with a minimum coverage of 2.0 metres for rail, and 1.2 metres for road crossings at transmission pressure. The current network characteristics are not in accordance with these requirements;
- The use of casings on steel pipelines without an appropriate inspection and maintenance regime has been assessed as presenting an unacceptable level of risk to the safety and integrity of the network;
- Most of the affected pipelines are now in excess of 20 years old. This means that corrosion is now likely to become evident. As the pipelines continue to age, the failure rate of the affected assets will increase.
- Casings on transmission pressure and high pressure pipelines pose a significant risk in terms of the potential volume of gas emanating from a leak, and the potential to disrupt supply to significant numbers of consumers.

1.1.4 Costs & Timing

The cost of establishing an integrity assessment program for the cased pipelines in accordance with the recommended option set out below. It is proposed to establish this integrity assessment program as part of the MAOP review process for the class 600 pipelines, and a sample testing program for the class 300 pipelines and high pressure steel mains.

All costs are expressed in $2009/10.

*Table **Error! No text of specified style in document.**-2 Cost of Pipeline Integrity Inspection per Casing*

COST OF PIPELINE INTEGRITY INSPECTION PER CASING $K (Real 2009/10)						
	2011-12	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Total**
Excavation Works	13.5	13.5	13.5	13.5	13.5	
LRUT[1] Pipeline Inspection	1.3	1.3	1.3	1.3	1.3	
Materials	0.5	0.5	0.5	0.5	0.5	
Internal Labour	0.4	0.4	0.4	0.4	0.4	
Total Cost per Casing	**15.7**	**15.7**	**15.7**	**15.7**	**15.7**	
Number of Casings	15	15	15	15	15	75
Total Cost	**236**	**236**	**236**	**236**	**236**	**1,180**

Note 1: LRUT means Long Range Ultrasonic Technique

1.1.5 Options Considered

Six options were considered to address the identified risks associated with cased steel pipelines. These were:

- Replace all cased sections of all classified pipelines and high pressure steel mains;
- Replace all cased sections of classified pipelines and perform LRUT inspections on cased sections of high pressure steel mains;
- Perform LRUT inspections on all cased classified pipelines and high pressure steel mains over the five years of the Access Arrangement period, and repair or replace as required;
- Perform LRUT inspections on all cased classified pipelines and repair or replace as required, with a view to extending this programs to high pressure steel mains in the next Access Arrangement period;
- (Recommended Option) – Perform LRUT inspections on all instances of casings on the class 600 pipelines over the five years of the Access Arrangement and repair or replace as required, and, based on the outcomes of site specific risk

analysis, sample test 10 of the remaining instances of casings on class 300 pipelines and high pressure steel mains each year with LRUT inspections, and repair or replace as required.

- Do nothing and accept the risk.

Option 1: - Replace all cased sections of all classified pipelines and high pressure steel mains

Cost Estimate: $30m (capital)

This is the ideal option, where all instances of casings on all classified pipelines and high pressure steel mains are removed and remedied by replacement of the affected section of the carrier pipe.

For budgeting this option, it was assumed that all 297 situations involving cased steel transmission pressure pipelines or high pressure steel mains would be replaced. Given the quantity of work involved this would need to occur over the 5 years of the Access Arrangement.

The scope of work includes:

- Survey of all instances of casings on classified pipelines and high pressure steel mains to report on their current status/condition;
- Prioritisation of replacement based on a risk assessment;
- Replacement of all affected situations over a five year period.

This option presents a consistent risk reduction strategy over five years, since the risk of premature failure of the carrier pipe is essentially independent of the location of the affected pipeline. The survey and subsequent risk assessment of all affected situations would identify higher risk locations, thereby allowing these to be replaced first.

This is the most conservative option. It requires significant capital investment to reduce the risk of premature failure, and fails to maximise the life of the affected assets. It does however, minimise the risk the risk of premature failure on the network.

Option 2: - Replace all cased sections of all classified pipelines and perform LRUT inspections on all cased sections of high pressure steel mains.

Cost Estimate: $16.6m (capital), + $410K p.a. Opex

This option focuses on mitigating the higher risks associated with cased classified pipelines, while accepting the lesser risk of cased high pressure steel mains. Classified pipelines have been prioritised for replacement on the basis that:

- Classified pipelines operate at a substantially higher pressure than high pressure steel mains, and therefore have a significantly higher potential severity of gas escape;

- Because of the higher operating pressures, reactive repairs to classified pipelines tend to be more difficult to effect and more difficult to achieve in a timely manner than on high pressure steel mains;

- Classified pipelines generally supply greater numbers of consumers with a single source of supply than high pressure steel mains. There is therefore a greater potential for supply to be disrupted to a larger number of consumers if supply on a classified pipeline is disrupted than there is likely to be with a similar disruption on a high pressure steel main.

This option involves replacement of all 166 instances of cased sections of classified pipelines. These sections would be replaced to the current AS2885 standard section 5.8.8. This would occur at the rate of 33 per year over the course of the Access Arrangement.

Ongoing inspection of the high pressure steel mains at the casings would be commenced and carried out on a five yearly basis. Repair or replacement of any affected mains would be performed on an as required basis. If, during the ongoing survey of high pressure steel mains sites, a hazardous situation is found to have occurred, then remediation or replacement of the high pressure steel main at this site would occur.

This is considered a pragmatic solution as it aligns with the requirements of the current AS2885 standard (i.e. covering the >1050 kPa system) for the classified pipelines, while managing the risks of failure of the less critical high pressure steel mains.

Option 3: - Perform LRUT inspections on all cased classified pipelines and high pressure steel mains over the five years of the Access Arrangement period, and repair or replace as required.

Cost Estimate: variable Capital, $933K p.a. Opex

This option focuses on maximisation of the life of the existing classified pipelines and high pressure steel mains, while managing the risk to a low level.

This option involves commencing a regular LRUT inspection program of all sites of casings on classified pipelines and high pressure steel mains, and assessing each location for deterioration. Replacement or repair of the installations would be carried out on an “as required” basis.

LRUT inspections at all casings would be commenced and carried out on a five yearly basis. Repair or replacement of any affected pipelines or high pressure steel mains would be performed on an as required basis based on technical evaluation of the condition of the carrier pipe at the time of the inspection. If, during the ongoing survey of the sites, a hazardous situation is found to have occurred, then remediation or replacement of the affected carrier pipe at this site would become a priority.

Normal leakage survey and cathodic protection inspections would be continued on all classified pipelines and high pressure steel mains.

This is considered a pragmatic solution as it maximises the useful life of existing network assets while managing the risks to an acceptable level.

Option 4: - Perform LRUT inspections on all cased classified pipelines and repair or replace as required, with a view to extending this programs to high pressure steel mains in the next Access Arrangement period.

Cost Estimate: variable Capital, $521K p.a. Opex

This option focuses on maximising the life of the existing classified pipelines, and managing the risk to an acceptable level at a reasonable cost, while postponing the lower risk high pressure steel mains to the next Access Arrangement period.

This option includes continuing the program of regular leakage survey and cathodic protection inspections of all sites of casings, and assessing each location for deterioration requiring replacement or repair as required.

In addition, LRUT inspections of the carrier pipe at the casings would be commenced and carried out on a five yearly basis for all class 600 and class 300 pipelines. Repair or replacement of any affected pipelines would be performed on an as required basis based on technical evaluation of the condition of the carrier pipe at the time of the inspection. If, during the ongoing survey of the sites, a hazardous situation is found to have occurred, then remediation or replacement of the affected carrier pipe at this site would become a priority.

High pressure steel mains would not be part of this LRUT inspection program. Rather, high pressure steel mains would be monitored as part of the ongoing leakage survey and cathodic protection monitoring program. Repairs or replacement of high pressure steel mains would be effected on an as required basis after defects become apparent.

This is considered an alternative solution to option 3, as it also maximises the useful life of existing network assets while managing the risks, although the risks would not be managed to as low a level as for Option 3.

Option 5: (Recommended Option) – Perform LRUT inspections on all instances of casings on the class 600 pipelines over the five years of the Access Arrangement

and repair or replace as required. In addition, based on the outcomes of site specific risk analysis, sample test 10 of the remaining instances of casings on class 300 pipelines and high pressure steel mains per annum, and repair or replace as required. Dependant on the results of this sample testing, this program may be extended in the next Access Arrangement period.

Cost Estimate: variable Capital, $236K p.a. Opex

This option also focuses maximising the life of the existing classified pipelines, while managing the risk, at a lower cost than all the other options except Option 6. This option is higher risk than the other options, with the exception of Option 6, but has the advantage of allowing APT Allgas to more accurately assess the extent of the problem, while immediately addressing the potentially higher risk instances.

The more rigorous inspection and analysis of the higher risk locations would be performed using the LRUT technology. The LRUT inspection at the casings on the class 600 pipelines would be commenced and carried out on a five yearly basis. Sample testing of the high risk class 300 pipelines and high pressure steel mains would be carried out on the basis of performing a total of 10 inspections per annum, unless the results of this testing program indicate modification of this program is required.

Leakage survey and cathodic protection inspections will be carried out at all sites on a six monthly basis as at present, with repair or replacement of any affected pipelines performed on an as required basis. If, during the ongoing survey of the sites, a hazardous situation is found to have occurred, then remediation or replacement of the affected carrier pipe at this site would become a priority.

This option is considered an alternative solution, as it also maximises the useful life of existing network assets while managing the risks, although the risks would not be managed to as low a level as for Options 3 or 4.

Option 6: Do Nothing – Accept the Risk

This option would require an acceptance of the existing risks, dealing with potential leaks on a reactive basis, and detecting gas escapes before they become a risk to the community.

The failure mechanism of sleeved crossing steel mains is pitting corrosion. Detection of the gas escape would be detected by leakage surveys or through public reports.

This is a very high risk strategy, particularly as the situations identified in this business case all occur on either classified pipelines or high pressure steel mains. These types of constructions form the spine of the APT Allgas gas distribution network. This means that any repair requiring shutdown of any classified pipeline

would be highly likely to cause interruption to supply for large numbers of consumers.

In addition, a significant number of casings occur under major roads and highways, which if closed to ensure public safety, would have severe detrimental ramifications for APT Allgas' reputation as a responsible operator of gas pipelines in Australia.

Further, it is considered that operating in such a reactive manner is inconsistent with prudent network operations.

1.1.6 Risk Assessment

The risk assessment for this Business Case is based on the APT Allgas document, Budget Planning for Stay in Business projects, Appendix B.

HAZARD NUMBER	HAZARD DESCRIPTION	HAZARD TREATMENT	HAZARD CLASSIFICATION	CONSEQUENCE							
				Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total	Priority
1	Reduced Pipeline Life due to no CP on Cased Section	Risk Untreated	Likelihood	Rare	Almost Certain	Rare	Rare	Rare	Rare		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Moderate	Low	Low	Low	Low		Moderate
			Risk Score	1	11	1	1	1	1	16	3
		Risk Treated	Likelihood	Rare	Likely	Rare	Rare	Rare	Rare		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Moderate	Low	Low	Low	Low		Moderate
			Risk Score	5	7	1	1	1	1	16	3
2	Significantly Reduced Pipeline Life due to Steel Casing Collapse	Risk Untreated	Likelihood	Rare	Almost Certain	Almost Certain	Unlikely	Likely	Likely		
			Consequence	Moderate	Moderate	Moderate	Minor	Minor	Moderate		
			Risk Level	Low	High	High	Low	Moderate	High		High
			Risk Score	3	16	16	2	7	12	56	2
		Risk Treated	Likelihood	Rare	Possible	Possible	Unlikely	Possible	Possible		
			Consequence	Moderate	Moderate	Moderate	Minor	Minor	Moderate		
			Risk Level	Low	Moderate	Moderate	Low	Low	Moderate		Moderate
			Risk Score	3	8	8	2	4	8	33	3
3	Gas Escape on Cased Major Road Crossing	Risk Untreated	Likelihood	Possible	Likely	Likely	Unlikely	Likely	Likely		
			Consequence	Severe	Moderate	Moderate	Minor	Moderate	Severe		
			Risk Level	High	High	High	Low	High	High		High
			Risk Score	13	12	12	2	12	17	68	2
		Risk Treated	Likelihood	Unlikely	Possible	Possible	Unlikely	Unlikely	Unlikely		
			Consequence	Severe	Moderate	Moderate	Minor	Moderate	Severe		
			Risk Level	Moderate	Moderate	Moderate	Low	Low	Moderate		Moderate
			Risk Score	9	8	8	2	5	9	41	3
4	Gas Escape on Cased Minor Road Crossing	Risk Untreated	Likelihood	Likely	Almost Certain	Likely	Unlikely	Likely	Likely		
			Consequence	Moderate	Minor	Moderate	Minor	Moderate	Moderate		
			Risk Level	High	Moderate	High	Low	High	High		High
			Risk Score	12	11	12	2	12	12	61	2
		Risk Treated	Likelihood	Unlikely	Possible	Possible	Unlikely	Unlikely	Unlikely		
			Consequence	Moderate	Minor	Moderate	Minor	Moderate	Moderate		
			Risk Level	Low	Low	Moderate	Low	Low	Low		Moderate
			Risk Score	5	4	8	2	5	5	29	3
5	Gas Escape on Cased Rail Crossing	Risk Untreated	Likelihood	Possible	Possible	Possible	Unlikely	Possible	Possible		
			Consequence	Severe	Severe	Moderate	Minor	Severe	Severe		
			Risk Level	High	High	Moderate	Low	High	High		High
			Risk Score	13	13	8	2	13	13	62	2
		Risk Treated	Likelihood	Rare	Rare	Rare	Rare	Rare	Rare		
			Consequence	Major	Severe	Moderate	Minor	Severe	Major		
			Risk Level	Moderate	Moderate	Low	Low	Moderate	Moderate		Moderate
			Risk Score	10	6	3	1	6	10	36	3

Priority	Priority Description
1	Any project where the 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.
2	Any project where the Risk Level of at least one risk area falls into High must be included in Priority 2. These projects could expose APA to business damage.
3	Any project where the Risk Level of at least one risk area falls into Moderate must be included in Priority 3. These projects could affect reliability of assets, operating efficiency or compliance.
4	Any project where the Risk Level of at least one risk area falls into Low must be included in Priority 4. These projects could affect overall APA risk reduction and operating efficiency.

This project has been assessed as High risk and has been assigned a Priority of 2.

1.1.7 Justification

APT Allgas considers that the additional operating expenditure that it is seeking in order to address the inspection requirements of classified pipelines and high pressure steel mains within casings is both prudent and efficient.

The expenditure is considered prudent as it significantly reduces the risks associated with these sites while improving the integrity of services to consumers and the community.

A review in 2009 carried out by APT Allgas Engineering personnel, identified cased steel mains as having a significantly increased risk of corrosion due to the environmental conditions inside the annular sleeve space, and the inability to ensure effective cathodic protection. The recommended project will address the risks associated with failure of these network assets.

It is important that these assets are monitored regularly to ensure the ongoing integrity of the assets. If this does not occur effectively, the high pressure at which classified pipelines and high pressure steel mains operate, means that there is a high potential for fire or explosion.

With limited accessibility, reactive repairs inside casings are difficult to effect. In addition, classified pipelines are often a single source of supply to large areas of the network. This means that failure of the carrier pipe involves hot tap, stoppling and bypasses to maintain network supply. This means that there is potential for supply to be disrupted to significant numbers of consumers.

The expenditure is considered by APT Allgas to be efficient, as this approach maximises the life of the carrier pipe through performance of ongoing integrity assessments, with asset replacement only being implemented at the end of each asset's life.

While Option 5 does not immediately reduce all risks to as low as reasonable practicable, it does provide a balanced approach to risk reduction and cost. The approach has the added benefit in that prioritisation of carrier pipe future replacement can be based on ongoing integrity assessments of existing assets. In

addition, replacement activities will be able to be performed in a planned and orderly manner.

1.1.8 Step Change Not in Base Year Costs

APT Allgas confirms that the additional $1.18m in operating expenditure associated with this proposal is not included in the base year costs for 2009/10.

1.1.9 Project Delivery

APT Allgas confirms that a combination of internal and external resources will be used to undertake this project.

1.1.10 Consequences of Not Proceeding

If this project is not undertaken, APT Allgas will be operating at an unacceptable level of risk as its main networks arteries operate at an unacceptably high level of risk.

APT Allgas Energy Pty Limited

Opex Business Case Maintenance of Bridge Crossings

Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100929 Opex Business Case _Maintenance of Bridge Crossings.doc

Contents

1.1 Maintenance of Bridge Crossings by Steel Pipelines

1.1.1 Project Overview

It is planned to introduce a program of regular inspection, and maintenance as required, of the above ground steel pipeline bridge crossings. This program is proposed to ensure maintenance of the pipelines' integrity and suitability for continued operation.

Steel pipelines operating at high pressure provide the backbone of the Allgas distribution system. Where required, these pipelines cross rivers, creeks, railway lines etc. While the majority of these crossings are under bored, a number have been constructed using an existing bridge or dedicated gantry as the supporting structure for the pipeline. As contact with the ground is non-existent in these situations, these bridge crossings rely solely on the pipeline coating to maintain the pipelines' resistance to corrosion. It is therefore important to ensure the integrity of the pipeline coating is maintained.

Bridge crossings are inspected by pipeline patrols monthly for high pressure steel mains, and weekly for classified pipelines. However, these inspections are limited to visual inspections, with no disruption to the pipeline coating in performing this work. Ideally, the condition of these pipelines should be periodically assessed by removal of the coating, with any required maintenance performed at the time. There has only been 1 instance in the past 5 years of work of this nature having been carried out.

This Business Case seeks to provide funds to implement a program of regular inspection and maintenance, in which a predefined number of bridge crossings are thoroughly inspected each year, and maintained as required. The exact program is as yet undefined as each bridge crossing would need to be assessed in the light of critical factors such as age, operating pressure, coating age and known condition, and proximity to a corrosive environment.

This business case seeks to reduce the risk of failure from corrosion of these pipelines by implementing a regular inspection and maintenance program. It is proposed to remove the protective coating from the pipelines to enable a full inspection to be carried out, rectify any faults found, and reapply the coating.

As there are over fifteen of this type of bridge crossing on the APT Allgas network, it is proposed to perform this work over the full five years of the Access Arrangement.

1.1.2 Background

Classified pipelines and high pressure steel mains form the backbone of the APT Allgas network. There are currently 15 instances where a steel pipeline crosses a

river, creek or railway. The age of these installations varies from 3 years to 40 years. These crossings have been regularly inspected, and as far as is possible without coating removal, visually assessed to ensure their ongoing integrity.

It has been determined through preliminary engineering assessment of the condition of these crossings, that it would be technically prudent to perform more rigorous inspections of these installations on a regular basis.

With bridge crossings, the major variable and major potential problem is access. In some cases, access will be easy, with the pipeline accessible under the pedestrian footpath of the bridge through removable covers. With others, particularly where the pipeline is supported below the carriageway of the bridge, access may be very difficult, potentially involving the erection of scaffolding along the entire length of the crossing, or working from barges, or design and construction of a specialised mobile scaffold arrangement.

The actual work, once access is established, will involve initial inspection of the coating integrity, removal of sections of the protective coating to allow sample inspection of the pipeline base material, non-destructive testing of the pipeline where deemed appropriate, maintenance of the pipeline as required, grit blasting and recoating of the pipeline. The condition of the pipeline where the sample sections of the coating are removed will determine whether the same process will be required over the full length of the bridge crossing.

Given that these bridges cross waterways, roads and railways, council and state government requirements stipulate the need for an environmental management plan to be prepared for each site, and environmental controls to be in place to ensure the work does not impact on the waterways or its surrounds.

Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- Cathodic protection of steel pipelines in exposed environments is not possible, thereby leaving the pipeline to be protected only by the pipeline coating system;
- Pipeline coating systems are subject to deterioration over time, the rate of which is determined by a number of environmental factors;
- Pipeline integrity is compromised by any breach in the pipeline coating system;
- Compromised pipeline integrity may lead to pipeline failure with undesirable consequences;
- Regular inspection and maintenance is required to ensure pipeline integrity is maintained at an acceptable level.

1.1.3 Costs & Timing

All costs are expressed in $2009/10 real.

*Table **Error! No text of specified style in document.**-1 Opex Expenditure Required for Inspection & Maintenance of Above Ground Bridge Crossings*

Opex Expenditure Required for Above Ground Bridge Crossings $K (Real 2009/10)						
	2011 -12	**2012 -13**	**2013 -14**	**2014 -15**	**2015 -16**	**Total**
Traffic Control (3 bridges)	15	15	15	15	15	75
Access (3 bridges)	35	35	35	35	35	175
Inspection (3 bridges)	75	75	75	75	75	375
EMP (3 bridges)	10	10	10	10	10	50
Significant Repairs (1 bridge)	25	25	25	25	25	125
Total	**160**	**160**	**160**	**160**	**160**	**800**

The forecast cost of $160K per year is based on:

- Fifteen crossings inspected at the rate of once every ten years, or an average of three crossings per year. Inspection costs to include traffic control, scaffolding, barge or EPV access as required depending on circumstances, full inspection of the wrapping and coating along the full length of the bridge, removal of short sections of pipeline coatings to inspect the integrity of the steel pipeline, recoat and rewrap pipeline. This is expected to average $45K per bridge;

- Depending on the results of the pipeline inspection, it may be necessary to perform more extensive maintenance on the coating or the steel pipeline. The cost of performing this maintenance is likely to be highly variable, depending on the magnitude and extent of any problems encountered during the inspection. A value of $25K has been nominated as the likely median value of performing this work, on one bridge crossing each year.

1.1.4 Options Considered

The necessity of performing regular inspections on this part of the network is inarguable. However, the frequency of inspections required to provide reasonable assurance of appropriate pipeline integrity in these situations is less clear.

Option 1 (Recommended): Inspect & maintain all above ground steel pipeline bridge crossings.

Cost Estimate: $800K over 5 years

The scope of work would include:

- Detailed survey of all above ground bridge crossings to report on the current status/condition;

- Risk Analysis to identify and prioritise higher risk locations;

- Preparation of environmental management plans and submission of these plans to councils and/or Department of Natural Resources and Water for approval;

- Erection of access equipment (where required), and suitable environmental controls, and removal at conclusion of work;

- Visual inspection of all pipeline coating over full length of bridge;

- Removal of sections of existing coating and visual assessment of coating efficacy and pipeline condition within these sections;

- Where required, removal of remainder of pipeline coating and assessment of pipeline condition;

- Performance of any maintenance requirements to pipeline;
- Where required, grit blasting of existing pipe work to required standard;
- Non destructive testing of the pipeline;
- Re-application of pipeline coating as required.

This project will reduce the risk of failure of the most critical supply pipelines within the APT Allgas distribution system.

Option 2: *Replace all 15 above ground bridge crossings on the high pressure network*

Cost Estimate: $3.75m

This option assumes that all of the crossings are replaced by directionally boring under the waterway to eliminate the need for future ongoing maintenance, using the average cost of $250K per crossing.

However, at the cost of $3.75m, this is not considered a viable option compared to the cost of inspection and re-coating the pipelines every 5 years.

Option 3*: Reactive maintenance in response to failure*

This option would require an acceptance of the existing risks, dealing with potential leaks on a reactive basis, detecting escapes before they become a risk to the community.

The failure mechanism of bridge crossing steel mains is likely to be via pitting corrosion with the gas escape expected to be picked up through special surveys or through public reports. There is some risk, in particular on high pressure mains, that repair could become problematic with interruption to supply expected. It is considered that operating in such a reactive manner is not consistent with prudent network operations.

1.1.5 Risk Assessment

The risk assessment for this Business Case is based on the APT Allgas document, Budget Planning for Stay in Business projects, Appendix B.

HAZARD NUMBER	HAZARD DESCRIPTION	HAZARD TREATMENT	HAZARD CLASSIFICATION	CONSEQUENCE						
				Health & Safety	Financial Impact	Environment	Compliance & Legal	Reputation	Total	Priority
1	Deterioration	Risk	Likelihood	Likely	Likely	Likely	Likely	Likely		
	in	Untreated	Consequence	Insignificant	Minor	Insignificant	Insignificant	Insignificant		
	Coating		Risk Level	Moderate	High	Moderate	Moderate	Moderate		High
	Integrity		Risk Score	4	8	4	4	4	24	2
		Risk	Likelihood	Possible	Possible	Possible	Possible	Possible		
		Treated	Consequence	Insignificant	Minor	Insignificant	Insignificant	Insignificant		
			Risk Level	Low	Moderate	Low	Low	Low		Moderate
			Risk Score	3	6	3	3	3	18	3
2	Incidental	Risk	Likelihood	Possible	Possible	Possible	Possible	Possible		
	Damage	Untreated	Consequence	Insignificant	Minor	Insignificant	Insignificant	Insignificant		
	to		Risk Level	Low	Moderate	Low	Low	Low		Moderate
	Pipeline		Risk Score	3	6	3	3	3	18	3
	Requiring	Risk	Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely		
	Repair	Treated	Consequence	Insignificant	Minor	Insignificant	Insignificant	Insignificant		
			Risk Level	Low	Low	Low	Low	Low		Low
			Risk Score	2	4	2	2	2	12	4
3	Significant	Risk	Likelihood	Possible	Possible	Possible	Possible	Possible		
	Damage	Untreated	Consequence	Insignificant	Minor	Insignificant	Insignificant	Insignificant		
	to		Risk Level	Low	Moderate	Low	Low	Low		Moderate
	Pipeline		Risk Score	3	6	3	3	3	18	3
	Requiring	Risk	Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely		
	Repair	Treated	Consequence	Insignificant	Minor	Insignificant	Insignificant	Insignificant		
			Risk Level	Low	Low	Low	Low	Low		Low
			Risk Score	2	4	2	2	2	12	4
4	Major	Risk	Likelihood	Possible	Possible	Possible	Possible	Possible		
	Damage	Untreated	Consequence	Insignificant	Minor	Insignificant	Insignificant	Insignificant		
	to		Risk Level	Low	Moderate	Low	Low	Low		Moderate
	Pipeline		Risk Score	3	6	3	3	3	18	3
	(no gas	Risk	Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely		
	escape)	Treated	Consequence	Insignificant	Minor	Insignificant	Insignificant	Insignificant		
			Risk Level	Low	Low	Low	Low	Low		Low
			Risk Score	2	4	2	2	2	12	4
5	Major	Risk	Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely		
	Damage	Untreated	Consequence	Major	Moderate	Moderate	Moderate	Major		
	to		Risk Level	High	Moderate	Moderate	Moderate	High		High
	Pipeline		Risk Score	10	6	6	6	8	36	2
	(with gas	Risk	Likelihood	Rare	Rare	Rare	Rare	Rare		
	escape)	Treated	Consequence	Major	Moderate	Moderate	Moderate	Major		
			Risk Level	High	Moderate	Moderate	Moderate	High		High
			Risk Score	4	3	3	3	4	17	2

Priority	Priority Description
1	be included in Priority 1. These projects should be regarded as non-discretionary.
2	be included in Priority 2. These projects could expose APA to business damage.
3	Priority 3. These projects could affect reliability of assets, operating efficiency or compliance.
4	Priority 4. These projects could affect overall APA risk reduction and operating efficiency.

1.1.6 Justification

This project represents maintenance expenditure that would be incurred by a prudent service provider in accordance with Rule 91(1).

1.1.7 Step Change Not in Base Year Costs

APT Allgas confirms that the additional $800K in operating expenditure associated with the bridge crossing inspection and maintenance program in its Queensland distribution network is not included in the base year costs for 2009/10.

1.1.8 Project Delivery

APT Allgas confirms that a combination of internal and external resources will be used to undertake this project.

1.1.9 Consequences of Not Proceeding

If this project is not undertaken, APT Allgas will potentially be exposed to an ever increasing risk of pipeline failure as pipeline coatings deteriorate due to age and their environment, and pipeline integrity becomes compromised.

APT Allgas Energy Pty Limited

Opex Business Case
Addition Revenue
Protection Officer

Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100810 Opex Business Case _ Additional Revenue Protection Officer.doc

Contents

1 Project Overview

The cost of UAG on APA Group's (APA's) Queensland network is currently $2.16M per annum, and is expected to rise to $4.03M in financial year 2011-12. This is a significant cost to APA. UAG on APA's Queensland distribution network has been at higher than desirable levels for a number of years now. More recently, UAG has been trending downwards, due to a project instigated by APA to achieve this outcome. This project identified that for this downwards trend to continue, or even for the current level of UAG to be maintained, additional dedicated resources are required. This Business Case therefore argues for an additional 0.5 FTE to be employed for revenue protection (UAG).

The historical UAG on the Allgas network is shown in Table 1, below.

Table 1: UAG History

APA QLD Networks UAG History – 2005/06 – 2009/10					
	2005/06 Actual	**2006/07 Actual**	**2007/08 Actual**	**2008/09 Actual**	**2009/10 Actual/ Forecast**
Volume (TJs)	359	254	445	438	356
Volume (%)	3.6	2.4	4.0	4.0	3.3
Cost ($M)	1.77	1.29	2.32	2.38	2.16
AA Determination		**1.5**	**1.4**	**1.4**	**1.3**

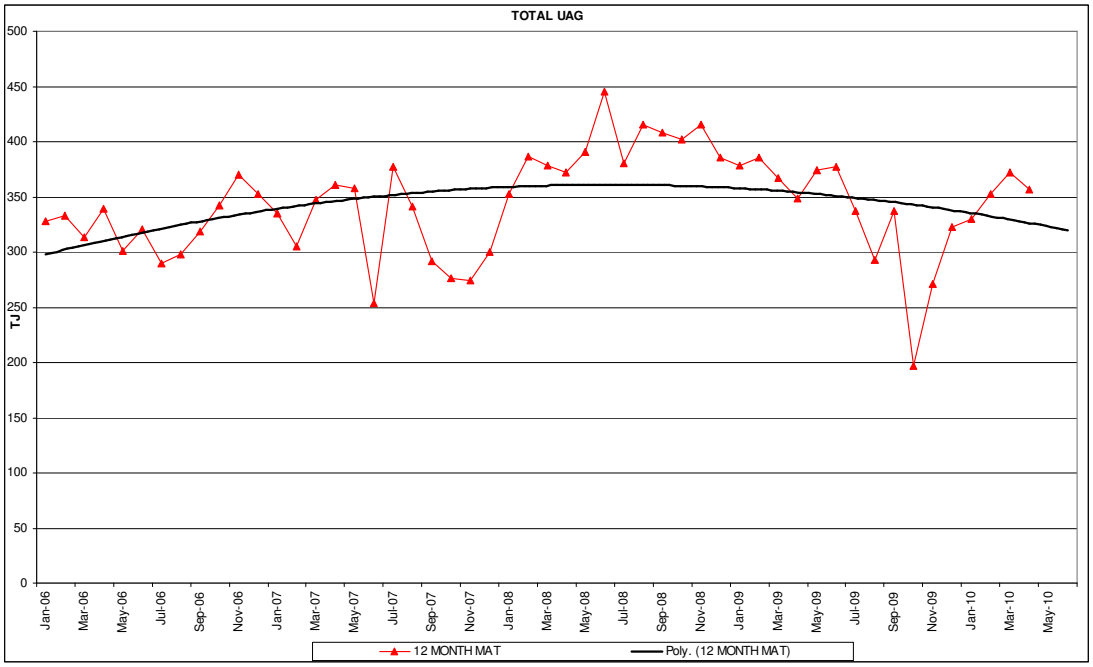
UAG is considered to be a normal parameter of a gas distribution network operation. Leakage from the network is typically a major component of UAG. In addition to leakage, there are a number of other factors that typically contribute to overall levels of UAG. These include metering errors, system/processing errors, theft, and damages to mains and services.

While APA regularly reviews UAG at a high level, there is a requirement for dedicated resources to continuously monitor trends and significant factors contributing to UAG, and to provide an investigative resource to identify and instigate remedial action, to ensure UAG is kept to as low a level as prudently possible.

2 Background

The chart below shows the history of UAG on the APA network.

Figure 1: UAG History



It can be seen from the trend line that UAG on the APA network was steadily increasing from January 06, and peaking around December 09, and declining thereafter until the present. Between January 06 and December 09, little attention had been paid to UAG as APA dealt with issues arising from change of ownership, and integration of the Allgas business into APA. From early 09, APA has been running a project to investigate the cause of continually increasing UAG on this network, and to reduce UAG from the current level to that expected of a prudent and efficient operation.

The major causes of UAG can be summarised as the following.

- Metering Errors:
  - Physical metering errors due to faulty mechanical metering device which is out of calibration;
  - Meter reading errors, no accesses;
  - Flow computer errors – lost meter pulses, failed temperature and pressure transmitters, incorrect calibrations;
  - Telemetry errors;
  - Failure to correct metered gas for temperature, pressure and altitude effects;

- Deviation of the gas from declared calorific value;
- Failure to estimate gas used while meters are temporarily inoperative.

- Gas lost by leakage from the Distribution System:
  - Leakage from mains;
  - Leakage from services;
  - Leakage from meter sets; and
  - Leakage from ancillary equipment.
- Gas losses resulting from operational activities:
  - Gas lost from damaged mains, meters and services;
  - Excessive operation pressures;
  - Gas discharged to atmosphere during construction and maintenance work;
  - Use of gas to charge new mains and for testing purposes;
  - Commissioning of gas installations;
  - Misappropriation of gas.
- Accounting and billing errors:
  - New customers not established in billing system;
  - New customers not added to meter reading routes;
  - Incorrect pressure factors in system;
  - Errors in UAG calculation methodology and source data from system.

While it is generally considered that leakage from mains and services comprises the major component of UAG, APA as a prudent operator, deems it necessary to ensure each of the aspects listed above is continually analysed to ensure all endeavours are achieved to minimise UAG to the network.

The role of this position would be to continually analyse the potential non-leakage aspects of UAG on the APA network, with a view to continuing the trend of overall decrease in UAG, and maintenance of the level of UAG at a prudent level

commensurate with established benchmarks. It is envisaged this individual will monitor and analyse UAG in detail for APA's Queensland distribution network, and identify and coordinate UAG reduction strategies to minimise UAG and increase overall revenue assurance confidence.

3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- A large quantity of data requires analysis to ensure gas injections and consumptions are recorded accurately.

4 Costs & Timing

The forecast cost of this proposal is based on salary and on-costs for one half of a full time employee (FTE). Table 1 provides a breakdown of the forecast costs of the recommended project for the period 1 June 2011 to 30 July 2016.

Table 2: Opex Expenditure Required for UAG Reduction

$K (Real 2009/10) – excluding overheads, GST						
Year	2011-12	2012-13	2013-14	2014-15	2015-16	**Total**
0.5 Data Analyst	50	50	50	50	50	**250**

The benefits of this program are expected to ensure that UAFG is reduced from the current levels, to those more in keeping with benchmarked levels in other comparable networks, and maintained at these lower levels indefinitely.

This program is expected to provide real savings in non-leakage UAG. Expected savings in non-leakage UAG, resulting from the output of this position are detailed in Table 3.

Table 3: Savings in UAG Resulting from Additional Resource Allocation

APA QLD Networks UAG Forecast – 2011/12 – 2015/16						
	2011/12	2012/13	2013/14	2014/15	2015/16	**Total**
Overall UAG (TJ)	339	317	296	277	260	**1,455**
Overall UAG (%)	3.7	3.4	3.2	3.1	2.9	**60**
Non-Leakage UAG (TJ)	176	166	158	152	147	
Non-Leakage UAG Saving (TJ)	10	10	8	6	5	
UAG Rate ($/GJ)	9.54	9.60	9.71	9.87	10.02	
Non-leakage UAG Savings ($000)	**95**	**96**	**78**	**59**	**50**	**378**

It can be seen from this that the additional position of Revenue Protection Officer appears to be cost effective. It should be noted that this anticipated reduction in UAG has been factored into the cost of UAG over the Access Arrangement period.

5 Options Considered

Employment of dedicated resources

Cost estimate: $250K over 5 years

The dedication of resources to specifically manage UAG will ensure that UAG is reviewed and investigated to ensure non-leakage UAG is reduced to an acceptable level.

The major objectives of the proposed program are to:

- Ensure that all data is analysed and investigated expeditiously to identify specific causes/contributors of UAG: and
- To develop and implement cost effective UAG mitigation strategies to reduce UAFG levels as low as reasonable.

The causes of UAG have been detailed above, and the purpose of the analyst will be to analyse data and develop strategies and business processes to minimise levels of UAG.

No other options have been considered.

6 Risk Assessment

If increased UAG analysis is not undertaken, APA could be exposed to a number of risks. They are:

- Non-leakage UAG will increase as equipment deteriorates undetected over time;
- Incorrect data may be provided to the market leading retailer for UAG billing;
- Consumer issues such as the following will occur;
  - Incorrect pressure factors,
  - Misappropriation of gas,
  - Unsafe metering equipment through tampering,
  - Metering and telemetry errors,

all resulting in an increasing cost of UAG.

The risk assessment for this Business Case is based on the APA Risk Matrix, contained in Appendix B of APA's Budget Planning for Stay in Business Projects.

HAZARD NUMBER	HAZARD DESCRIPTION	HAZARD TREATMENT	HAZARD CLASSIFICATION	CONSEQUENCE							
				Health & Safety	Financial Impact	Customer & Business Interruption	Environment	Compliance & Legal	Reputation	Total	Priority
1	Undetected Non-Leakage UAG Increase	Risk Untreated	Likelihood	Rare	Almost Certain	Rare	Rare	Almost Certain	Likely		
			Consequence	Minor	Minor	Minor	Minor	Moderate	Moderate		
			Risk Level	Low	Moderate	Low	Low	High	High		High
			Risk Score	1	11	1	1	16	12	42	2
		Risk Treated	Likelihood	Rare	Likely	Rare	Rare	Possible	Possible		
			Consequence	Minor	Minor	Minor	Minor	Moderate	Moderate		
			Risk Level	Low	Moderate	Low	Low	Moderate	Moderate		Moderate
			Risk Score	0	7	1	1	8	8	25	
2	Incorrect data to Retailer for UAG Billing	Risk Untreated	Likelihood	Rare	Almost Certain	Rare	Rare	Likely	Likely		
			Consequence	Minor	Minor	Minor	Minor	Moderate	Moderate		
			Risk Level	Low	Moderate	Low	Low	High	High		High
			Risk Score	1	11	1	1	12	12	38	2
		Risk Treated	Likelihood	Rare	Possible	Rare	Rare	Possible	Possible		
			Consequence	Minor	Minor	Minor	Minor	Moderate	Moderate		
			Risk Level	Low	Low	Low	Low	Moderate	Moderate		Moderate
			Risk Score	0	4	1	1	8	8	22	
3	Undetected Errors with Consumer Meter Pressure Factors	Risk Untreated	Likelihood	Rare	Almost Certain	Rare	Rare	Almost Certain	Possible		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Moderate	Low	Low	Moderate	Low		Moderate
			Risk Score	1	11	1	1	11	4	29	3
		Risk Treated	Likelihood	Rare	Possible	Rare	Rare	Possible	Possible		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low	Low		Low
			Risk Score	1	4	1	1	4	4	15	
4	Undetected Consumer Misappropriation of Gas	Risk Untreated	Likelihood	Almost Certain	Almost Certain	Possible	Rare	Rare	Rare		
			Consequence	Moderate	Minor	Minor	Minor	Minor	Minor		
			Risk Level	High	Moderate	Low	Low	Low	Low		High
			Risk Score	16	11	4	1	1	1	34	2
		Risk Treated	Likelihood	Possible	Possible	Rare	Rare	Rare	Rare		
			Consequence	Moderate	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Moderate	Low	Low	Low	Low	Low		Moderate
			Risk Score	8	4	1	1	1	1	16	
5	Unsafe Metering Equipment caused by Undetected Tampering with Meter	Risk Untreated	Likelihood	Almost Certain	Almost Certain	Possible	Rare	Rare	Rare		
			Consequence	Moderate	Minor	Minor	Minor	Minor	Minor		
			Risk Level	High	Moderate	Low	Low	Low	Low		High
			Risk Score	16	11	4	1	1	1	34	2
		Risk Treated	Likelihood	Possible	Possible	Rare	Rare	Rare	Rare		
			Consequence	Moderate	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Moderate	Low	Low	Low	Low	Low		Moderate
			Risk Score	8	4	1	1	1	1	16	
6	Undetected Increase in Metering & Telemetry Errors	Risk Untreated	Likelihood	Rare	Almost Certain	Possible	Rare	Almost Certain	Almost Certain		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Moderate	Low	Low	Moderate	Moderate		Moderate
			Risk Score	1	11	4	1	11	11	39	3
		Risk Treated	Likelihood	Rare	Possible	Rare	Rare	Unlikely	Unlikely		
			Consequence	Minor	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Moderate	Low	Low	Low	Low		Moderate
			Risk Score	1	4	1	1	2	2	11	

Priority	Priority Description
1	Any project where the 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.
2	Any project where the Risk Level of at least one risk area falls into High must be included in Priority 2. These projects could expose APA to business damage.
3	Any project where the Risk Level of at least one risk area falls into Moderate must be included in Priority 3. These projects could affect reliability of assets, operating efficiency or compliance.
4	Any project where the Risk Level of at least one risk area falls into Low must be included in Priority 4. These projects could affect overall APA risk reduction and operating efficiency.

This project has been assessed as High risk and assigned a Priority 2.

7 Justification

Consistent with the requirements of rule 91 of the National Gas Rules, APA considers that the additional $250K in operating expenditure that it is seeking in order to address maintain and possible reduce the current levels of UAG and the risk associated with inadequate monitoring of UAG identified in its Queensland network would be:

- Prudent – the expenditure is necessary in order to allow the timely analysis and addressing of identifiable UAG impacts and to undertake the necessary investigatory and corrective activities to ensure APA's distribution network is operated safely, and that the loss of gas through UAG is reduced below current levels. This will mitigate the risk of customer consumption not being captured, and allow actual gas use to be billed correctly, reducing the potential loss of revenue;

- Consistent with accepted and good industry practice – identifying causes of UAG as early as possible and investigating these reasons will reduce safety risks and decrease the UAG that is currently being experienced, and is necessary to maintain the safety and integrity of the network.

- Efficient – the early investigation of data and UAG causes will enable APA to address the UAG losses at an earlier point in time.

8 Step Change Not in Base Year Costs

APA confirms that the additional $250K in operating expenditure associated with dedicated revenue protection in its Queensland distribution network is not included in the base year costs for 2009/10. The requirement for this function has occurred largely due to the introduction of many more telemetered demand sites (116 now compared to 32 when the last Access Arrangement was determined).

In addition, telemetry is now performed within Allgas, whereas it was previously outsourced. That option is no longer available to APA.

9 Project Delivery

APA confirms that internal resources will be used to undertake this project.

10 Consequences of Not Proceeding

If this project is not undertaken, APA will potentially:

- Be exposed to a number of risks that will overstate the UAG position with which a prudent operator would operate a like gas distribution network. These include, but are not limited to, incorrect pressure factors, misappropriation of gas, unsafe metering equipment through tampering, increased gas leaks, metering and telemetry errors, and an increasing cost of UAG.

APT Allgas Energy Pty Limited

Deployment of New Technology

Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100902 - Opex Business Case - Deployment of New Technology.doc

Contents

1 Project Overview

Average residential consumption in Queensland is significantly below that for other states. This is due to a variety of factors, the most significant being climatic, and the low demand for space heating in Queensland's sub-tropical climate. In addition, average residential consumption has been dropping for several years now, largely due to the decline in (hot) water consumption, and the move to reverse cycle air conditioners for space heating and cooling. The effect of this is that network utilisation has declined in recent years, and is likely to stay low in the foreseeable future.

In order to mitigate this situation, it is planned to establish a New Technology role to facilitate the deployment of evolving gas technologies into the Queensland market.

1.1 Background

Queensland has always had significantly lower average residential gas consumption than southern states. Typically, average Queensland residential gas consumption is around 10.7 GJ p.a., compared to 18 GJ p.a. in southern states. This is largely attributable to two factors, namely Queensland's milder climate resulting in a reduced requirement for residential space heating, and higher ground temperatures resulting in reduced consumption to achieve equivalent volumes of hot water.

Analysis indicates a declining trend in residential natural gas consumption for the previous 10 years. This trend has been associated with changing demographic in Queensland, reduced water consumption (especially gas fuelled hot water consumption), the trend for households to use whitegoods which load cold water and use electricity to heat the water in the machines, improved appliance efficiency, and a move to electrically powered reverse cycle air conditioners, in preference to gas fuelled space heaters.

During the previous 10 years average residential gas consumption has fallen from 10.7 GJ p.a. in 2000, to 8.8 GJ p.a. today. This trend is partially attributable to reduced consumption of hot water and partially due to reduced levels of space heating as consumers change to reverse cycle air condition in preference to gas space heating. Now that the drought is over, the reduction due to reduced hot water consumption is expected to partially reverse as consumers start to use more (hot) water. However, the part of the trend attributable to reduced levels of space heating is expected to continue as consumers continue to change to reverse cycle air conditioning. This is particularly noticeable in Toowoomba.

The final outcome of these trends is unknown, but it is expected that the water saving mindset in consumers will continue, albeit partially relaxed, and the installation of reverse cycle air conditions will continue, with the result that average

residential consumption will recover to and stabilise at levels well below the 10.7 GJ p.a. of a decade ago. This situation will result in increased residential tariffs as gas distributors and retailers endeavour to recover the true cost of supplying low volumes of gas to consumers using a distribution network with low utilisation. Higher tariffs will lead to further reductions in consumption as the unit price of available energy from gas continues to increase at a faster rate than alternative energy sources, thereby reducing the competitiveness of gas. This cycle will continue at an ever increasing rate until the point where gas is an uneconomic fuel for both new and existing residential consumer connections. If this occurs, there will be no role for natural gas as a fuel in residential applications.

Gas is currently utilised in only three residential applications. These are water heating, cooking, and space heating.

Gas consumption for water heating has reduced due to a number of factors. Perhaps the most significant of these is the recent drought, during which SE Queensland residents were encouraged, as part of universal water conservation measures, to take no longer than 4 minutes in the shower. While this cut the overall water consumption, it also significantly cut hot water consumption and therefore gas consumption for the majority of households with gas hot water. While restrictions have now been eased somewhat, the mindset for shorter showers has now been established. In addition to this, Queenslanders were encouraged, through Queensland Government initiatives, to purchase new water efficient whitegoods such washing machines and dishwashers. Not only do these new appliances use less water, but it is common for these new appliances to be connected to cold water only, relying on internal electrical elements to heat any water used. Most also washed just as effectively in cold water as hot, again reducing the usage of gas.

Gas consumption for cooking overall is a small proportion of total gas load. Not only is the total volume used fairly small, but the demand for gas resulting from cooking is very peaky. This means that from a network manager's point of view, residential gas cooking is a relatively undesirable load, making it difficult to achieve high utilisations of network capabilities.

In Queensland, the volume of gas attributable to space heating is substantially less than that in southern states. Similarly, gas consumption for space heating is now becoming the exception rather than the norm for the majority of Allgas franchise distribution area. The only exception to this is Toowoomba, where the cooler climate encourages use of space heating. The Queensland demographic is very dynamic, as population movement from southern states continue. This changing demographic, the Queensland climate, and improved technology has resulted in an increased demand for reverse cycle air conditioning. Its ability to cool during the hot and humid summer months, and with it's COP of just under 4, economically heat during the short winter months, has proven to be more attractive to consumers than gas space heating, with its ability to heat only. Gas, therefore, has lost market share to reverse cycle air-conditioners.

By comparison with the doom and gloom news for gas, electricity consumption by residential consumers continues to increase due to installation of air conditioning, increased load from new washing machines and dishwashers, and greater numbers of electric appliances such as computers, plasma televisions and portable kitchen appliances.

In order to reverse the declining role of natural gas it is important that new and evolving technologies which utilise gas be introduced into the Queensland market as soon as possible. Currently, potential technologies include:

- Gas-fired air-conditioning;
- Gas-fired combined absorption chilling/heating/hot water;
- Natural gas for vehicles;
- Embedded generation;
- Small scale cogeneration;
- Micro-cogeneration, and
- Fuel cells.

Because these technologies increase the volume of gas used, while flattening the demand curve, they have the potential to lead to better utilisation of the gas distribution network, and reduce the high level of investment required to upgrade electricity infrastructure to meet peak electricity demand.

This Business Case argues for the employment of additional dedicated resources, whose sole objective is to investigate new technological improvements to gas fuelled equipment and facilitate the introduction of these appliances into the Queensland market. To achieve this, it is envisioned that the following activities will be required:

- Monitor the development of new and improved gas related technology;
- Prioritise these technologies based on suitability for the Queensland market;
- Facilitate approvals by statutory authorities for the of these technologies in Queensland;
- Coordinate field trials of demonstration units;
- Lobby government to promote use of the new technologies, including provision of relevant subsidies; and

- Co-ordinate introduction of new technologies by relevant suppliers to the Queensland market.

It is not planned that this resource would become involved in the technical research or product development. Rather the additional resource is required to co-ordinate the introduction of the new technologies onto the Queensland market. APA believes that this type of work could best be carried out by senior engineer with appropriate commercial experience.

1.2 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

- Average Queensland residential gas consumption is traditionally lower than in southern states;
- This traditionally lower level has been further reduced during the last decade due to a number factors;
- If the level continues at this lower level the cost benefit of supplying gas to residential consumers will be compromised, leading to further reductions in numbers of residential gas consumers.
- Traditional gas powered equipment currently used in residential applications will be inadequate to reverse this trend.
- New uses for gas in a residential context are required to increase average residential consumptions of gas. This is best achieved using new technologies.
- Increased average residential volumes will assist retailers and distributors to achieve cost effective delivery of gas to residential consumers.

1.3 Costs & Timing

The cost of establishing the New Technology role is set out below. The lower expenditure in the first two years recognises that is will take time to identify and hire appropriately skilled personnel, prioritise technologies for demonstration trails and initiate those trials.

It is proposed to share the costs of this activity 50/50 between Envestra and APA. All costs are expressed in $2009/10 real.

Table 2: Opex Expenditure Required for Development & Deployment of New Technology

	2011-12	2012-13	2013-14	2014-15	2015-16	Total
Senior Engineer	50	50	50	50	50	**250**
Total	**50**	**50**	**50**	**50**	**50**	**250**

1.4 Options Considered

Employment of dedicated resources

Cost estimate: $625K over 5 years

No other options have been considered.

1.5 Risk Assessment

Given the very clear evidence of the low average residential gas consumption, and the unlikely event that the current trend of declining average residential gas consumption will be fully reversed, and given the understanding of the reasons for the occurrence of this phenomenon, it can be seen that action is required to find new ways of increasing average residential gas consumption. This can best be achieved through the introduction of new technology onto the Queensland market. If this does not occur, the role of gas in residential applications will decline to the point where it is no longer economically viable to compete against alternative fuels.

The risk assessment for this Business Case, is based on the APA Risk Matrix contained with Appendix B of the APA document Budget Planning for Stay in Business Projects.

HAZARD NUMBER	HAZARD DESCRIPTION	HAZARD TREATMENT	HAZARD CLASSIFICATION	CONSEQUENCE						
				Health & Safety	Financial Impact	Environment	Compliance & Legal	Reputation	Total	Priority
1	Missed Revenue from Failure to Adopt New Technology	Risk Untreated	Likelihood	Rare	Almost Certain	Rare	Rare	Rare		
			Consequence	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Moderate	Low	Low	Low		Moderate
			Risk Score	1	11	1	1	1	15	3
		Risk Treated	Likelihood	Rare	Possible	Rare	Rare	Rare		
			Consequence	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low		Low
			Risk Score	0	4	0	0	0	4	
2	Residential Consumers Churn to Alternative Fuels Because Gas Uneconomical	Risk Untreated	Likelihood	Rare	Likely	Rare	Rare	Likely		
			Consequence	Minor	Moderate	Minor	Minor	Moderate		
			Risk Level	Low	High	Low	Low	High		High
			Risk Score	1	12	1	1	12	27	2
		Risk Treated	Likelihood	Rare	Possible	Rare	Rare	Unlikely		
			Consequence	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low		Low
			Risk Score	1	4	1	1	2	9	
3	Increase C&I Tariffs to Compensate Falling Residential Revenue	Risk Untreated	Likelihood	Rare	Likely	Rare	Rare	Likely		
			Consequence	Minor	Moderate	Minor	Minor	Moderate		
			Risk Level	Low	High	Low	Low	High		High
			Risk Score	1	12	1	1	12	27	2
		Risk Treated	Likelihood	Rare	Unlikely	Rare	Rare	Unlikely		
			Consequence	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low		Low
			Risk Score	1	2	1	1	2	7	
4	C&I Consumers Churn to Alternative Fuels Because Gas Uneconomical	Risk Untreated	Likelihood	Rare	Likely	Rare	Rare	Likely		
			Consequence	Minor	Severe	Minor	Minor	Major		
			Risk Level	Low	High	Low	Low	Extreme		Extreme
			Risk Score	1	17	1	1	21	41	1
		Risk Treated	Likelihood	Rare	Unlikely	Rare	Rare	Unlikely		
			Consequence	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low		Low
			Risk Score	1	2	1	1	2	7	
5	Value of Allgas Business Reduced	Risk Untreated	Likelihood	Rare	Almost Certain	Rare	Rare	Almost Certain		
			Consequence	Minor	Catastrophic	Minor	Minor	Catastrophic		
			Risk Level	Low	Extreme	Low	Low	Extreme		Extreme
			Risk Score	1	25	1	1	25	53	1
		Risk Treated	Likelihood	Rare	Unlikely	Rare	Rare	Unlikely		
			Consequence	Minor	Minor	Minor	Minor	Minor		
			Risk Level	Low	Low	Low	Low	Low		Low
			Risk Score	1	2	1	1	2	7	

Priority	Priority Description
1	Any project where the 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.
2	Any project where the Risk Level of at least one risk area falls into High must be included in Priority 2. These projects could expose APA to business damage.
3	Any project where the Risk Level of at least one risk area falls into Moderate must be included in Priority 3. These projects could affect reliability of assets, operating efficiency or compliance.
4	Any project where the Risk Level of at least one risk area falls into Low must be included in Priority 4. These projects could affect overall APA risk reduction and operating efficiency.

This project has been assessed as Extreme risk and has been assigned a Priority of 1.

1.6 *Justification*

Unless positive action can be taken to increase the role of natural gas in residential applications, there is a very real risk to the APA networks business. Positive action requires the implementation of new innovative technologies, some of which are currently available overseas, but not yet in Australia, and others are under ongoing development.

With a 15 year life of a typical appliance, the average residential (potential) consumer is required to make a replacement decision affecting each time. This equates to 6% of all existing residential gas demand being at risk in any given year. In Queensland, this equivalent to approximately $0.5M of revenue being at risk each year on the APA distribution network. The expenditure to counteract this is less than 25% of the annual at-risk amount.

The expenditure is in response to a fundamental change in the business environment arising from external factors, and would be incurred by a prudent service provider in accordance with the National Gas Rules, Rule 91(1). In addition, this project seeks to ensure that tariff increases in future access determinations are maintained at realistic levels, cost effective to end consumers.

1.7 *Step Change Not in Base Year Costs*

APA confirms that the additional $625K in operating expenditure associated with this proposal is not included in the base year costs for 2009/10.

1.8 *Project Delivery*

APA confirms that internal resources will be used to undertake this project.

1.9 *Consequences of Not Proceeding*

If this project is not undertaken, APA will potentially be in a situation where the cost of supplying residential consumers with natural gas comprehensively exceeds that of alternative fuels. If this occurs it will lead to further decline of the residential market for APA.

APT Allgas Energy Pty Limited

Opex Business Case
Market Rule Changes
Effective
01 July 2011 – 30 June 2016

Core service or market
Date of issue
20100902 Opex Business Case_ Market Rule Changes.doc

Contents

1 Project Overview

Participation in the various rules committees is now a necessary part of gas distribution business. The national framework for gas market arrangements governs the wholesale and retail gas market in Queensland. The Australian Energy Market Operator (AEMO) is the gas market operator for QLD, where full retail contestability commenced in July 2007.

It is necessary to resource adequate representation on market rules committees in order to ensure that APA's interests are protected. This is an activity that was not realised in the previous Access Arrangement. It is now recognised that we are under resourced to adequately cope with this activity.

The implementation of the Short Term Trading Market (STTM) in QLD will commence when implementation of the pilot markets in South Australia and New South Wales is complete, and will increase commercial risk for market participants trading in the market. With this there will be a greater emphasis on the quality and reliability of metering data delivered to the market on a daily basis by service providers (including APA). This will require additional resourcing to allow the implementation of 7 day/week remote monitoring of gas day data, in order to manage this increased risk.

To meet all the obligations this presents it is necessary to create a full time employee (FTE), supported by appropriate systems, to manage and co-ordinate the needs and challenges presented by the establishment of these markets.

The activities to be supported include data management, with daily data validation and reporting to the market, committee representation and additional monitoring with the commencement of the STTM.

Presently this work is being resourced across several FTEs, who manage it along with other duties. We are now very close to full capacity of these resources and will exceed full capacity with the introduction of the STTM. We will then need to hire a new FTE dedicated to this activity.

2 Background

The Australian Competition and Consumer Commission (ACCC) has authorised market arrangements designed to benefit consumers by promoting more efficient and competitive retail gas markets. The Australian Energy Market Operator (AEMO) has published rules and procedures that govern the conduct and operations of the retail gas market in Queensland.

APA currently participate in a number of rules committees in QLD, including;

- The QLD Gas Retail Market Consultative Forum (GRCF-Q);
- Various sub committees supporting the gas market including;
    - The IT Development Forum (ITDF-Q),
    - Gas Transaction Protocol Working Group (GTPWG-Q)

The GRCF-Q reviews and considers changes to the Retail Market Procedures, including the process of balancing and apportioning in the gas market. The Retail Market Procedures are designed to provide efficient arrangements for customers to transfer between retailers and incorporates balancing and allocation provisions to ensure a more efficient gas retail market. The Retail Market Procedures also govern the process by which daily metering data is processed and delivered to the market by the network operator and pipeline operators.

The ACCC sees formal gas market arrangements in terms of policy and systems as critical to allow a competitive gas market to be successful. They see the public benefit of these markets far outweighs any public detriment.

With respect to the Short Term Trading Market (STTM), the government has developed a framework for a short term trading market to help facilitate the development of economically efficient gas markets.

The STTM will help facilitate the development of economically efficient gas markets through:

- Providing transparent price signals for gas delivered and withdrawn from defined market hubs;
- Enabling the participation of all major gas users, including direct transmission customers (wherever practicable);
- Efficiently pricing congestion on the system (including facilitating a market based solution to emergencies if possible); and
- Facilitating secondary trading (including demand side response) in the short term.

APA has participated in the development of the STTM market design via the STTM Working Group (STTM WG) and is now in the process of ensuring that its systems and processes are in readiness for the start of the pilot market in South Australia in June 2010.

Metering data quality and the reliability of its collection, processing and delivery to the market is critical in supporting the STTM. In the QLD gas market, APA does not

currently monitor the end of gas day data reporting process on weekends or public holidays. Interval meter data collected from the telemetry system on these days is processed and sent to AEMO automatically.

Data risk will potentially be higher under STTM because whilst the opportunity for estimated data to be replaced with actual data after the gas day will remain, the market price of gas that is set for a gas day will stand. If this price has been influenced by decisions made by market participants who may have relied on estimated or erroneous data, there is potential for adverse market outcomes. Market participants may seek reimbursement from APA to compensate for any costs incurred as a result of settlement using estimated or erroneous data. The additional costs incurred by APA under this proposal would be small relative to the potential compensation costs should APA provide erroneous data.

It is expected that APA's involvement in all QLD forums will continue to increase over time. In the lead up to STTM implementation, changes required to the Retail Market Procedures will be considered in detail. As the STTM matures, and commercial outcomes under the new market become apparent, it is likely that the Retail Market Procedures will require further changes and fine tuning, requiring a high level of ongoing committee activity. It is also expected that the performance of APA's meter data collection, processing and delivery systems will be closely monitored by AEMO as market operator, and also by the rest of industry.

3 Key Assumptions/Drivers

The key assumptions and drivers for the recommended project are:

4 Costs & Timing

All costs are expressed in $2009/10 real and exclude overheads.

Market Rules	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	Total
Manager/Supervisor	50	50	50	50	50	**250**
Total	**50**	**50**	**50**	**50**	**50**	**250**

The costs of this project have been based on apportioning the costs across APA's Allgas network, and Envestra's networks managed by APA. They cover the cost of a new senior position involved in management and supervision of these activities on a full time basis. With on-costs this is expected to cost $200k per annum, $150k per annum to be born by Envestra and $50k per annum by APA. It is expected that this

position will share its time equally across all APA's and Envestra's distribution networks. The cost put forward in this paper is one quarter of the total cost, this being APA's share of the cost.

5 Options Considered

Employment of dedicated resources

Cost estimate: $250K over 5 years

The dedication of resources to specifically manage and be involved in the market rule changes process will ensure that APA's interested are represented appropriately and professionally to the relevant market regulatory authorities.

In addition, this position would ensure that correct consumer consumption data is supplied to the relevant authorities.

Without this position, APA's interests could be severely compromised.

No other options have been considered.

6 Risk Assessment

Without adequate resourcing in this area there could be a loss of control of distribution processes in the operation of the gas markets with the potential introduction of new processes, which due to lack of representation, may require new systems at significant cost to the industry.

In regard to the STTM, APA could be exposed to significant risks if processes are not put in place to ensure the reliable daily delivery of quality data that are commensurate with those being put in place by the rest of the industry. This risk would be amplified if AEMO as market operator decides to increase its level of support to the market from 5 days a week to 7 days a week when the STTM starts.

7 Justification

The new dedicated position will allow APA to influence market rules, policies and procedures so that its interests are protected.

This is critical to a sustainable market operation designed to promote efficient investment in, and efficient operation and use of, natural gas services. A well

managed market will ensure the long term interests of consumers of natural gas is protected with respect to price, quality, safety, reliability and security of supply of natural gas.

With respect to the STTM, the market will be better served by introducing a process whereby the automatic end of gas day data reporting process is monitored remotely 7 days a week. This would involve an on-call roster system for a number of IT/analyst staff, allowing manual intervention to ensure that every effort is made to process and deliver accurate data to AEMO on time, thereby reducing potential for error. The additional costs to APA of introducing this process are a direct result of operating in the new STTM environment.

The increased expenditure is in relation to increased participation in various rules committees and the need for APA to dedicate resources to operating in the new STTM environment for which it is currently under resourced. It is considered that these costs qualify as those that would be incurred by a prudent service provider in accordance with the Nation Gas Rules, Rule 91(1).

This activity represents expenditure that would be incurred by a prudent service provider in accordance with the National Gas Rules, Rule 91 (1), as it is necessary to:

- Maintain and improve the safety of services;
- Maintain the integrity of services.

8 Step Change Not in Base Year Costs

APA confirms that the additional $250K in operating expenditure associated with this proposal is not included in the base year costs for 2008/09.

9 Project Delivery

APA confirms that internal resources will be used to undertake this project.

10 Consequences of Not Proceeding

If this project is not undertaken, APA will potentially:

Suffer from lack of influence over distribution processes in the operation of the gas markets with the potential introduction of new processes.

Be at significant risk if processes are not put in place to ensure the reliable daily delivery of quality data that are commensurate with those being put in place by the rest of the industry.