

## Business Case – Capital Expenditure

# Dandenong City Gate Gas Quality

Business Case Number BC224 AA23-27

## 1 Project Approvals

**TABLE 1: BUSINESS CASE – PROJECT APPROVALS**

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<b>Cost Updated By</b>	Prasoon Premachandran	Victorian Team Lead Project Delivery, Engineering & Planning
<b>Reviewed By</b>	Nicholas King	Senior Mechanical Engineer, Engineering & Planning
<b>Approved By</b>	Daniel Tucci	Victorian Asset Manager, Asset Management

## 2 Project Overview

**TABLE 2: BUSINESS CASE – PROJECT OVERVIEW**

<b>Description of Issue/Project</b>	<p>A brief summary of the project:</p> <ul style="list-style-type: none"> <li>Problem of inadequate gas temperature requirements of NGR rule 288 injecting into the T16 pipeline due to no gas heating equipment installed at the Dandenong City Gate.</li> <li>Affects: Inability for AEMO to ensure the quality of the gas entering the T16 pipeline complies with the gas quality Standards as set out in the AEMO procedures, enforced by law.</li> <li>Impact: gas that does not meet the AEMO gas quality standards requires notifications and potentially curtailment, it may be damaging to the T16 pipeline and/or pose a public risk if for example condensate reaches consumer assets</li> <li>Successful solution will: Install suitable gas heating in line with the requirements of the NGR, rule 288.</li> </ul>
<b>Options Considered</b>	<p>The following options have been considered:</p> <p>Option 1: Do Nothing Option</p> <p>Option 2: Install a gas heater compliant with the requirements of NGR rule 288</p>
<b>Estimated Cost</b>	\$1,379,240
<b>Relevant Standard</b>	Under the National Gas Rules, Rule 288, all injection points into the Victorian Declared Transmission System must meet gas quality requirements
<b>Consistency with the National Gas Rules (NGR)</b>	<p>The capital expenditure complies with the new capital expenditure criteria in Rule 79 of the NGR because:</p> <ul style="list-style-type: none"> <li>it is necessary to maintain and improve the safety of services, maintain the integrity of services and to comply with a regulatory obligation or requirement (Rules 79(2)(c)(i),(ii),(iii));</li> </ul>
<b>Key Stakeholders</b>	<p>The following stakeholders are affected by this project:</p> <ul style="list-style-type: none"> <li>The stakeholders for this project are AEMO and the local field services team looking after the facility.</li> <li>AEMO engagement will include the review and approval of a gas quality business case.</li> <li>Field services engagement will include all O&amp;M requirements in the operation of the gas heater.</li> </ul>
<b>Benefits to Customers and Consumers</b>	Installing the gas heating system will ensure compliance with the NGR and ensure the T16 pipeline and attached assets are protected from potential damage or shutdowns due to off- spec gas. This provides a reliability of supply for customers and consumers.

### 3 Background and Project Need

The Dandenong City Gate provides a pressure regulated connection between the Declared Transmission System and Dandenong Gas Network customers.

At present there is no gas heating before the pressure regulation at the Dandenong City Gate. As a result the downstream temperatures are regularly sub zero in winter which means that condensate dropout can occur and has the potential to impact customers.

AEMO is required to ensure the quality of gas entering the Declared Transmission System is safe for conveying in the pipelines and safe for consumers to use.

The lack of gas heating affects AEMO’s ability to ensure the quality of the gas entering the T16 pipeline complies with the gas quality standards as set out in the AEMO procedures which are enforceable by law. Gas that does not meet the AEMO gas quality standards requires notifications and potentially curtailment. Further it may be damaging to the T16 pipeline and/or pose a public risk if for example condensate reaches consumer assets.

Under the National Gas Rules (NGR), Rule 288, all injection points into the Victorian Declared Transmission System must meet gas quality requirements.

There is a need to install suitable gas heating in line with the requirements of the NGR, rule 288.

### 4 Risk Assessment

Gas demand, gas pressure differential (pressures upstream and downstream of the pressure regulating station) and ambient conditions are the variables that affect gas temperature, non-compliance is likely throughout winter as when temperatures are low gas demand tends to increase.

The scenario considered in table 3 is that we continue with Option 1 - do nothing approach which involves APA responding to isolate flow until the temperature is in specification, this approach exacerbates the supply constraint as customers continue to consume downstream gas which in turn increases the pressure differential causing a greater temperature drop when reinstated. There is a threat to reliable end user equipment operation if the supplied gas is not fit for public use and is non-compliant to the National Gas Rules.

**TABLE 3: RISK RATING**

Risk Area	Consequence	Likelihood	Risk Level
Health and Safety	- Injury / illness resulting in time lost from work of one day / one shift or more (LTI) - Member of the public requiring medical treatment	Unlikely [every 5yrs]	Low
Environment	No consequence identified	N/A	N/A
Operational	Unplanned interruption of: - ≥ 5 days to the delivery of non-firm services (including bi-directional, reverse flow or backhaul services) - < 1 day to the delivery of firm services	Frequent [many times in 1yr]	Moderate
Reputation & Customers	Sustained: - adverse local media articles on APA - detrimental social media comments One off negative reports by financial analysts	Unlikely [every 5yrs]	Low
Compliance	Non-compliance reportable to a regulator with potential for regulatory investigation or fines	Unlikely [every 5yrs]	Moderate
Financial	≤ \$15M	Unlikely [every 5yrs]	Negligible

<b>Final Risk Rating</b>	<b>Untreated</b>			<b>Moderate</b>
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## 5 Options Considered

### 1.1 Option 1 – Do Nothing

The do nothing option would see the continuation of gas entering the Declared Transmission System at sub zero temperatures and would be non-compliant with AEMO direction for gas to entering the Declared Transmission System. If there were a condensate event that impacted customers AEMO may direct APA to cease injections from Dandenong City Gate until rectified.

#### 1.1.1 Assessment

Not installing the gas heating is not compliant with the NGR, it will also mean there is a risk of curtailment on non-compliance grounds. It also risks potential damage to the Declared Transmission System assets due to gas not meeting specification as defined in Australian Standards.

### 1.2 Option 2 – Install Gas Heating System

Install NGR compliant gas heating system at the Dandenong City Gate.

The option would install a gas heater with associated controls, connection to the site SCADA and provision of gas heater information to the Integrated Operations Centre, Dandenong and AEMO control rooms.

#### 1.2.1 Cost/Benefit Analysis

Installing the Gas Heating System will ensure compliance with the NGR, it will ensure the risk of curtailment on non-compliance grounds is averted. It will also ensure the Dandenong Gas Network assets are protected from potential damage due to off specification gas. Another benefit will be the reduction in unplanned maintenance which frees up field resources but also reduces the risk of incident or injury (unplanned maintenance often occurs at night or in inclement weather).

Option 2 is the preferred option.

### 1.3 Assessment of Options

TABLE 4: SUMMARY

Option	Description	Costs
Option 1	Do Nothing	
Option 2	Install Gas Heating System	<b>\$1,379,240</b>

## 1.4 Proposed Solution – Install Gas Heating System

### 1.4.1 What is the Proposed Solution?

Install NGR compliant gas heating system at the Dandenong City Gate.

The option would install a new instrument shelter with four new analysers associated calibration and consumable gases, connection to the site SCADA and provision of gas quality information to the IOC, Dandenong CR and AEMO CR.

APA have a standard suite of instruments generally used to comply with the NGR and this is what is proposed.

### 1.4.2 Why are we proposing this solution?

Installing the Gas Heating System will ensure compliance with the NGR, it will ensure the risk of curtailment on non-compliance grounds is averted. It will also ensure the T16 pipeline and attached assets are protected from potential damage or shutdowns due to off-spec gas.

### 1.4.3 What are the costs/risks involved with this option?

Costs for this project are well understood as APA has installed a gas heating on numerous similar assets the most recent in VTS was the Wollert CG in 2015, the Dandenong City Gate gas heating system would be almost identical.

Risks to the cost/delays would be dependent on components sourced offshore and gas heating system demand locally.

### 1.4.4 Consistency with the National Gas Rules

Consistent with the requirements of Rule 79 of the National Gas Rules, APA considers that the capital expenditure is:

- Prudent – The expenditure is necessary in order to maintain and improve the safety of services and maintain the integrity of services to customers and personnel and is of a nature that a prudent service provider would incur.
- Efficient – The field work will be carried out by a suitably qualified external contractor. The expenditure will be undertaken consistent with the APA procurement policy. The expenditure can therefore be considered consistent with the expenditure that a prudent service provider acting efficiently would incur.
- Consistent with accepted and good industry practice – Addressing the risks associated with gas quality is accepted as good industry practice. In addition, the reduction of risk to as low as reasonably practicable in a manner that balances cost and risk is consistent with Australian Standard AS2885.
- To achieve the lowest sustainable cost of delivering pipeline services – The sustainable delivery of services includes reducing risks to as low as reasonably practicable and maintaining reliability of supply.

### 1.4.5 Forecast Cost Breakdown

The costs are based on similar gas heater installations for this project.

**TABLE 5: PROJECT COST ESTIMATE,**

	Total
Internal Labour	\$235,740
Materials	\$655,000
Contracted Labour	\$338,500
Other Costs	\$150,000

<b>Total</b>	\$1,379,240
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## 6 Acronyms

Acronym	Definition/Description
<b>AEMO</b>	Australian Energy Market Operator
<b>AGA</b>	Australian gas association – Type B compliance governing body
<b>API</b>	American Petroleum Institute – publisher of standards
<b>HAZOP</b>	Control system HAZOP – study of the control system functions to identify logic vulnerabilities
<b>ESD</b>	Emergency shutdown – control system-initiated shutdown designed to prevent incident escalation if operating parameters are breached
<b>ESV</b>	Energy Safe Victoria
<b>HAZOP</b>	Hazard and operability study
<b>HMI</b>	Human machine interface
<b>ILI</b>	Inline inspection – pipeline internal inspection
<b>OEM</b>	Original Equipment Manufacturer
<b>RA</b>	Risk Assessment
<b>RBI</b>	Risk Based Inspection – a process used to prioritise maintenance or inspection activities based on risk of failure.
<b>SIL</b>	Safety Integrity Level – an assessment used to rank control systems by their ability to fail safely
<b>SMS</b>	Safety Management Study
<b>VTS</b>	Victorian Transmission System