Business Case – Capital Expenditure

RTU Replacement

Business Case Number 262

1 Project Approvals

TABLE 1: BUSINESS CASE – PROJECT APPROVALS

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Reviewed By	Atul Fotedar, *Electrical and Instrumentation Engineer, APA Group*
Approved By	Craig Bonar, *Manager East Coast Grid Engineering, APA Group*

2 Project Overview

TABLE 2: BUSINESS CASE – PROJECT OVERVIEW

Description of Issue/Project	This project comprises of the upgrade of the Remote Telemetry Units (RTU) equipment at facilities within the Victorian Transmission System (VTS)
Options Considered	The following options have been considered: 1. Option 1: Do Nothing Option 2. Option 2: Replace the RTUs pro-actively by schedule 3. Option 3: Immediate replacement of all RTUs
Estimated Cost	$ 709,083
Consistency with the National Gas Rules (NGR)	The replacement of these assets complies with the new capital expenditure criteria in Rule 79 of the NGR because: • it is necessary to maintain and improve the safety of services and maintain the integrity of services (Rules 79(2)(c)(i) and (ii)); and • it is 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 (Rule 79(1)(a)).
Stakeholder Engagement	The stakeholders relates to this project are: • Australian Energy Market Operator • Energy Safe Victoria

3 Background

Some APA facilities (compressors, pressure regulator stations (PRS) and line valves) are presently monitored and controlled by Bristol 3300 series RTUs.

This series of RTU has become obsolete and consequently is no longer supported by the manufacturer. Spare parts are limited and soon will not be available.

APA is experiencing an increase in the frequency of Bristol 3300 series RTU failures.

APA is required by Energy Safe Victoria (ESV) and AS2885 to operate high pressure pipelines in a safe and reliable manner.

The Victorian Pipeline Regulations 2007 require under section 21 (2) that “For the purposes of section 109(a) of the Act, a pipeline must be operated in accordance with AS 2885.2-2002 and AS2885.3-2001.”

AS2885.3 section 5.2 (b) requires that “……the operating pressure at any point in the pipeline does not exceed the MAOP, and that transient pressure does not exceed 110% of the MAOP”. To achieve this APA has equipment specifically designed with SCADA monitoring and alarms.

Failure of a monitoring and control RTU at a PRS typically results in the active regulator failing open and monitor regulator operating at a default pressure set point. Failure of a monitoring and control RTU at a compressor station typically removes a key preventative control leaving operations reliant upon equipment to continue operating on current setting. Safety trips will remain operational.

AS 2885.3 Section 5.8.1 (f) requires in a station related clause that “When deviations from the normal operating conditions that affect the safety of the pipeline occur, corrective action shall be initiated immediately.” Where RTUs have failed, the identification of an unsafe supply condition and immediate corrective action would be difficult to achieve.

Obsolescence for the RTU’s is not an immediate threat to supply reliability, however to continue operations under this circumstance would leave APA vulnerable to any failure, which would most likely see extensive delays as suitable spare components are found. This situation will deteriorate with increasing age.

The Bristol 3300 series RTUs do not support TCP/IP communication. Service providers are withdrawing leased line services and APA Group is progressively moving to IP based services. In due course no spares will be available to maintain and repair the RTU equipment. This would lead to delays in recovering SCADA control and data from the sites.

The following facilities require upgrade:

RTU Model	Location	Duty
Bristol - 3330	Lara CG	Pressure control and over pressure protection for gas flowing between the Brooklyn-Corio and Lara-Iona (SWP) Pipelines.
Bristol - 3330	Seagas GC	Gateway for provision of Zonal Heating Value from station to AEMO Victoria for network management.
Bristol – 3310	Dandenong Supervisory RTU	Fire pump control and monitoring at the Dandenong City Gate.
Bristol – 33xx	Culcairn	Interface between flow meter and AEMO control room. Used by AEMO for control of Victorian Gas Transmission Network.
Bristol – 33xx	Burrumbuttock	Line Valve Control, Pressure and Temperature Monitoring
Bristol – 33xx	Birregurra	Line Valve Control, Pressure and Temperature Monitoring
Bristol – 33xx	Mirne	Line Valve Control, Pressure and Temperature Monitoring
Bristol – 33xx	Geringhap	Line Valve Control, Pressure and Temperature Monitoring

4 Risk Assessment

There are risks associated with the potential failure of the obsolete RTUs generally relating to loss of site communication and subsequent loss of monitoring and control. The RTUs listed above are important components for the safe operation and control of the VTS, providing information to assist control of the VTS and linepack as well as providing a means of emergency diagnosis and isolation in the event of pipeline rupture or other emergency.

The following are the identified significant risks related to an RTU Failure:

- The loss of an RTU may disable the first level control function of the site. Where the RTU performs an active role the active regulator would fail to the open position with no SCADA overview. This reduces the level of over-pressure protection at a time when SCADA isn't able to access and monitor site data.

- The loss of an RTU at a compressor station would disable the ability of the operator to start or stop equipment or change set points. In the event of increasing demand there could be a partial loss of supply.

TABLE 3: RISK RATING

Risk Area	Risk Level
Health and Safety	**Low**
Environment	**Low**
Operational	**Moderate**
Customers	**Moderate**
Reputation	**Nil**
Compliance	**Moderate**
Financial	**Low**
Final Untreated Risk Rating	**Moderate**

5 Options Considered

5.1 Option 1 – Do Nothing

The Do Nothing option is to permit the RTU to degrade until critical failure or until detected and deemed inoperative. The result will be delays or local attendance and manual control until the failed RTU is replaced causing non-operability of critical equipment. A recent event on the South East South Australia (SESA) pipeline and at Brooklyn Compressor Station demonstrated where the loss of communications and/or the loss of RTU functionality resulted in significant effort to maintain supply. These incidents are serious and in both occasions have required RTU alterations post incident.

5.1.1 Cost/Benefit Analysis

The costs involved with doing nothing is delayed capex. But the additional cost will be incurred if the RTU undergoes a failure during operation. The additional costs are the costs to expedite a solution; this will involve a lead time on new RTU and might require paying a premium for quick delivery. The main risk in this option is as the equipment is already obsolete and intentionally retaining would be inappropriate as the risk to supply efficiency is increasing with age.

5.2 Option 2 – Replace the RTU pro-actively by schedule

This option permits a scheduled approach in replacing the RTU. By scheduling a change out of critical site RTU's will mitigate failures.

5.2.1 Cost/Benefit Analysis

The costs involved with this option are that the expenditure can be regular. As sites are upgraded the risk is limited to those that are still waiting RTU upgrade. This can be mitigated by identify critical sites that has a higher possibility of failure.

5.3 Option 3 – Immediate replacement of all RTUs

This option permits a full replacement of the existing RTUs with the new RTUs for all site at once, which will remove the risks of failures.

5.3.1 Cost/Benefit Analysis

The costs involved with this option are that the expenditure will be greater. As sites are upgraded all at once the benefit will be the removal of any potential failures of the old RTUs before they occur.

5.4 Summary of Cost/Benefit Analysis

The section should include a general overview of how the options compare and identify any options are not technically feasible.

TABLE 4: SUMMARY OF COST/BENEFIT ANALYSIS

Option	Benefits (Risk Reduction)	Costs
Option 1	Do Nothing	-
Option 2	Replace RTUs pro-actively by schedule	$709,083over the period of 5 years
Option 3	Immediate replacement of all RTUs	$709,083

5.5 Proposed Solution

5.5.1 Replace RTUs pro-actively by schedule

The scope of the projects will be to replace the RTU's by schedule. The replacement RTU's will be installed by identifying the critical sites and completing them first. The benefits of this solution includes:

- Identification of critical site RTUs
- Good balance between capital expenditure and risk
- Increase reliability of communication
- Maintainability is improved
- Average Age of fleet of RTUs remains flat overtime

5.5.2 Why are we proposing this solution?

This capital expenditure project is justified under Rule 79(2)(i) and 79(2)(ii) as the work is necessary to improve the safety of services and ensure the correct operation of all equipment on the site. The solution is 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 improve the reliability of operation and is of a nature that a prudent service provider would incur.

- Efficient – The new RTUs will ensure that down-time of equipment is reduced and therefore the operational capability of the equipment increases.

- Consistent with accepted and 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 Standards AS3000 and the Occupational Health and Safety Act.

5.5.3 Forecast Cost Breakdown

TABLE 5: PROJECT COST ESTIMATE,

	Total
Internal Labour	**$ 202,595**
Materials	**$ 401,352**
Contracted Labour	**$ 105,136**
Other Costs	**$0**
Total	**$ 709,083**

Appendix A – Cost Estimate

Item	Lara CG	Seagas GC	Dandenong Supervisory RTU	Culcairn	Burrumbuttock	Birregurra	Mirne	Geringhap	Total
Labour	31,600	31,600	13,100	11,700	18,400	18,400	18,400	18,400	293,700
Contractors	25,500	8,000	8,000	10,000	20,400	20,400	20,400	20,400	226,100
Materials	35,000	11,000	11,000	8,400	16,400	16,400	16,400	16,400	228,000
Total Solution Cost	92,100	50,600	32,100	30,100	55,200	55,200	55,200	55,200	747,800
Comment	5 Reg Runs plus Bypass Run. Electronic pressure control	Gateway for provision of Zonal Heating Value from station to AEMO Victoria for network management	Monitoring only, small site.	Gateway for provision of flow data from station to AEMO Victoria for network management	Line valve site with 1 Line Valve, pressure and temperature monitoring	Line valve site with 1 Line Valve, pressure and temperature monitoring	Line valve site with 1 Line Valve, pressure and temperature monitoring	Line valve site with 1 Line Valve, pressure and temperature monitoring	