Business Case – Capital Expenditure

Battery Chargers

Business Case Number 212

1 Project Approvals

TABLE 1: BUSINESS CASE – PROJECT APPROVALS

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Reviewed By	Brian Reynolds, *Senior 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	Battery Charger replacement for backup power control for the following stations: • Longford • Pakenham • Iona • Morwell • Tyers
Options Considered	The following options have been considered: 1. Option 1: Do Nothing Option 2. Option 2: No alternative identified 3. Option 3: Replace battery charging systems
Estimated Cost	$ 351,421
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	Stakeholders affected by this project are: • Gas Market • Landowners • Energy Safe Victoria

3 Background

Stations with control functionality require electricity to operate safely and efficiently, this power supply is provided from 24VC battery banks which are maintained in a fully charged state by battery chargers. This enables safe and efficient performance during intermittent electricity provider shutdowns. The batteries are maintained by operations personnel and monitored by battery chargers so as to provide a reliable and fully charged supply of DC power for the station control and safety systems. Total failure of battery chargers may result in shutdown of the station control

and monitoring systems even though mains electricity may still be available. Alternatively, the batteries will not be able to supply backup power when required as they are not charged sufficiently.

The fleets of battery chargers within the VTS are in various levels of integrity and age, refer to the table in section 5.3.2. In addition the older models have less intrinsic redundancy than the newer designs available.

The batteries themselves usually require replacement more frequently than battery chargers. Typical replacement rates for batteries are 8 to 10 years and 20+ years for battery chargers.

4 Risk Assessment

TABLE 3: RISK RATING

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

The effect of a failed battery charger can lead to the following:

1. Possible explosion of batteries or loss of chemical contents that could harm maintenance staff.
2. Loss of control and monitoring of the site, potentially leading to a failure to supply incident, failure to measure critical metering information such as gas pressure, flow, quality etc.

5 Options Considered

5.1 Option 1 – Do Nothing

The Do Nothing option is to wait for battery charger failure. The result of failure will result in loss of monitoring and control of the affected site and possible loss of supply to customers and parts of the Victorian Gas Transmission Network. The affect will last until replacement battery chargers and batteries can be sourced and installed which could be up to 2 months.

5.1.1 Cost/Benefit Analysis

- The benefits are delayed capex.
- The costs are wasted capability in that the otherwise serviceable batteries are not able to deliver any power as they are not adequately charged, resulting in loss of control and monitoring of the site until replaced. The failures listed in the risks category may materialise.

5.2 Summary of Cost/Benefit Analysis

TABLE 4: SUMMARY OF COST/BENEFIT ANALYSIS

Option	Benefits (Risk Reduction)	Costs
Option 1	Do Nothing	Cost is loss of system security and is not quanitifiable
Option 2	No alternative identified	
Option 3	Replace superseded charger designs	$ 351,421

5.3 Proposed Solution – Option 3

5.3.1 Replace Battery Chargers prior to failure

There are multiple battery chargers within the VTS of various designs. The proposed solution is to replace the older, poor integrity chargers with the latest design that has inbuilt redundancy. The following locations have been selected for replacement:

- Longford
- Pakenham
- Iona
- Morwell
- Tyers

5.3.2 Why are we proposing this solution?

The battery chargers are an important component of the control and monitoring systems of the Victorian Transmission System, without functioning battery chargers the affected sites cannot be remotely monitored or controlled. In some cases gas flow will be interrupted.

Failure to maintain adequate batteries and battery charging solutions will result in a loss of system capacity if/when failure occurs.

The following table lists all the stations and their battery models. Charger models are not listed specifically however the older battery installations will have superseded battery chargers installed. When new battery chargers are installed the batteries are also replaced.

The likely replacement year is driven by age and the station criticality. Some stations, such as Longford, has a backup generator and backup batteries and thus is less critical than others.

Location	Type	Year Installed	Likely replacement year
Gooding	Eaton	2014	2020
Wollert CS	Eaton	2007	2016
Wollert CG	Eaton	2008	2016
Brooklyn CS	Eaton	Stage 1 Building 2013 Stage 2 Building 2013	2021
Brooklyn CG	Eaton	2008	2017
Iona	Unknown	Pre 2007	2018+
Springhurst	Eaton	2010	2018
Euroa	Eaton	2012	2022
Winchelsea	Eaton	2014	2024
Lara	Unknown	Unknown	Replacement required ASAP
Wandong	Unknown	Pre 2007	2018+
Longford	Unknown	Pre 2007	2018+
Pakenham	Unknown	Unknown	Replacement required ASAP
Morwell CG	Unknown	Pre 2007	2018+
Tyers PL	Unknown	Pre 2007	2018+
Dandenong CG	Eaton	2015	2025

5.3.3 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 purpose of the equipment is to maintain efficiency. The selected design has demonstrated performance. 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 the poor charging of batteries and replacing assets that have reached the end of their useful life 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.

5.3.4 Forecast Cost Breakdown

The costs for this work are well known as multiple battery charger installations have occurred recently on new compressor stations.

TABLE 5: PROJECT COST ESTIMATE,

	Total
Internal Labour	**$100,406**
Materials	**$183,135**
Contracted Labour	**$67,880**
Other Costs	**0**
Total	**$ 351,421**