Business Case – Capital Expenditure

SMS Aerial Photography

Business Case Number BC227 AA23-27

1 Project Approvals

TABLE 1: BUSINESS CASE – PROJECT APPROVALS

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Costed By	Klaudia Furness	Team Lead Corridor Protection (VIC/SA), Engineering & Planning
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Approved By	Daniel Tucci	Victorian Asset Manager, Asset Management

2 Project Overview

TABLE 2: BUSINESS CASE – PROJECT OVERVIEW

Description of Issue/Project	The Australian Standard for transmission pipelines AS2885.1 (sec 2) requires that a Safety Management Study (SMS) is to be conducted as a minimum every five years to identify location specific and non-location risks along the entire length of the pipeline. The identification of land use changes and population density is a fundamental input to the SMS and is best performed by aerial photography with feature identification. Improvements in technology allow for improved visibility of unauthorised encroachments and impacts from natural events e.g. earth quakes, subsidence, flooding.
Options Considered	The following options have been considered: Option 1: Use existing outdated photography (5 years old) Option 2: Compile new Aerial photography for using improved technology
Estimated Cost	$295,000 (Note: $200,000 currently locked in submission but additional $95k now needed)
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 following external stakeholders are affected by this project: • Energy Safe Victoria

3 Background

Resubmitted – recurring requirement

The Australian Standard for transmission pipelines is AS2885. Section 2.2.5 of this standard requires a Safety Management Study (SMS) to be conducted every five years, as a minimum. AS2885.1 Section 2.3.2.2 nominates the identification of land use changes and population density to be a fundamental input to the SMS. This is best performed

by aerial photography with feature identification. This technique greatly increases the validity of the SMS and with As Low As Reasonably Practical (ALARP) assessments.

The photography is utilised in many ways. From identification of land use and land use changes. For pipeline protection officers to understand the baseline development within the measurement length and to assist with land owner liaison.

The other use includes planning for route optimisation of future pipeline looping projects. The imagery is orthorectified which permits accurate measurement and land appreciation.

4 Risk Assessment

The primary risks are the failure to identify a land use change within the measurement length of the pipeline and therefore failure to identify land use classification change, which may lead to a change in risk classification, and a failure to identify new location specific risks. This will create errors in the SMS and failure to implement appropriate risk controls (procedural and physical) for the higher consequence areas not identified, and new risk sources introduced since the last 5 yearly SMS review.

TABLE 3: RISK RATING

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

5 Options Considered

5.1 Option 1 – Do Nothing – Use existing outdated aerial photography

The Do Nothing option is to use poor or dated aerial photography, making the SMS inaccurate and not compliant with the obligations under Regulation 21 of the Pipelines Regulations 2007 that identify that operation and maintenance of the pipeline must comply with AS2885.

Many operational activities are based upon the frequencies determined from the outcomes of the Safety Management Study including; easement maintenance, signage, pipeline patrol, stakeholder contacts and the pipeline awareness program.

The benefit of completing a correct and up to date study using current aerial surveillance assists in identifying and properly managing threats and satisfying the obligation that pipeline licensees must protect property and people from adverse impacts of pipeline operation. The VTS is also declared as Vital Critical Infrastructure by the Minister for Resources under the Emergency Management Act, which means security of supply is also an important part of pipeline asset management safety.

5.2 Summary of Cost/Benefit Analysis

TABLE 4: SUMMARY OF COST/BENEFIT ANALYSIS

Option	Benefits (Risk Reduction)	Costs
Option 1	Do Nothing	Indeterminate
Option 2	No technically acceptable option identified	
Option 3	Aerial photography	$295,000 ($200k in current submission)

5.3 Option 2: Aerial Photography – Proposed Solution

The aerial photography of the entire VTS is over 2,000km of high definition photography gathered by charter aircraft specifically modified for the purpose.

5.3.1 Why are we proposing this solution?

This solution enables the SMS to be accurate and compliant with AS2885 and is common practice in the industry. Other forms of aerial photography can include satellite and free information available from Google Earth™ and Nearmap™. Whilst these two options are novel, they have the following liabilities:

- Satellite data is generally more expensive than chartered aircraft.
- Google Earth™ and Nearmap™ data is not usually orthorectified and the imagery is of various quality and indeterminate age. In particular, Nearmap™ does not include all pipeline areas outside of metropolitan Melbourne.

Recent developments in aerial photography processing has enabled cost effective feature identification to determine if the pipeline easement has any structures or other risk intensifiers present. This data analysis is a significant qualitative benefit to utilising specialist contractors for aerial photography and is not available with Google Earth™ and other data platforms.

The AER has approved this expenditure in the past.

5.3.2 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 the external contractor that has been used to date, who has demonstrated specific expertise in delivering high quality imagery in a safe and cost effective manner. 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 – The systematic identification of risks and consequence changes are the minimum acceptable standard. Aerial photography is the only reliable means of producing an accurate SMS.
- 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 by identifying threats accurately.

5.3.3 Forecast Cost Breakdown

The aerial photography required for the VTS has recently been quoted at $295,000. However, prior to the quotation a preliminary budget of $200,000 was allocated in time for the November 2021 submission

TABLE 5: FORECAST SUMMARY

Totals	Estimate
Internal Labour	$10,000
Materials	
Contracted Labour	$285,000
Other Costs	
Total	**$295,000**

6 Acronyms

Acronym	Definition/Description
AEMO	Australian Energy Market Operator
AGA	Australian gas association – Type B compliance governing body
API	American Petroleum Institute – publisher of standards
CHAZOP	Control system HAZOP – study of the control system functions to identify logic vulnerabilities
ESD	Emergency shutdown – control system-initiated shutdown designed to prevent incident escalation if operating parameters are breached
ESV	Energy Safe Victoria
HAZOP	Hazard and operability study
HMI	Human machine interface
ILI	Inline inspection – pipeline internal inspection
OEM	Original Equipment Manufacturer
RA	Risk Assessment

RBI	Risk Based Inspection – a process used to prioritise maintenance or inspection activities based on risk of failure.
SIL	Safety Integrity Level – an assessment used to rank control systems by their ability to fail safely
SMS	Safety Management Study
VTS	Victorian Transmission System