Business Case – Capital Expenditure

Reliability Centred Maintenance

Business Case Number BC307 AA23-27

1 Project Approval

TABLE 1: BUSINESS CASE – PROJECT APPROVALS

Prepared By	Shane Ide	Manager Facilities Engineering, Engineering & Planning
Costed By	Shane Ide	Manager Facilities Engineering, Engineering & Planning
Reviewed By	Robert Hall	Manager Asset Performance & Lifecycle, Asset Management
Approved By	Daniel Tucci	Victorian Asset Manager, Asset Management

2 Project Overview

TABLE 2: BUSINESS CASE – PROJECT OVERVIEW

Description of Issue/Project	Existing maintenance tasks have never been rationalised in accordance with equipment criticality or reliability. They are mostly defined from rudimentary OEM manuals or replicated from seemingly similar assets without consideration of asset criticality or application. Detail is discretionary depending on the project team and handover quality. Subsequently many tasks are not fit for purpose. Currently we have tasks that are either not required or simply do not proactively prevent trips / downtime and or increase MTBF. We are not currently utilising our operations and maintenance resources in the most efficient manner nor are they aligned to safety, reputational and commercial goals. Applying RCM principles to maintenance strategy development will allow us to generate fit for purpose strategies that align with asset/business criticality. Doing the right tasks at the right time, on the right equipment will increase reliability reducing preventable reactive maintenance, as well as improving availability.
Options Considered	The following options have been considered: 1. Option 1: Do Nothing Option 2. Option 2: Complete RCM strategy development on VTS transmission assets
Estimated Cost	$2.25 Mil
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 are stakeholders involved in the successful delivery of this project: • AEMO • Transmission Operations Personnel

3 Background

Existing asset maintenance tasks have never been rationalised in accordance with equipment criticality or reliability. They are mostly defined from rudimentary OEM manuals or replicated from seemingly similar assets without consideration of asset criticality or application and are generally heavily slanted towards routine component replacement. Maintenance detail has historically been discretionary depending on the project team and asset handover quality. Subsequently many tasks are not fit for purpose for the plant or the operating context. Currently we have tasks that are either not required or simply do not proactively prevent trips / downtime and or increase MTBF. We are not currently utilising our operations and maintenance resources in the most efficient manner nor are they aligned to safety, reputational and commercial goals.

APA is currently undertaking a program of RCM implementation across its gas transmission assets nationally thus providing an ideal opportunity to realise reliability benefits in the VTS whilst sharing project and process establishment costs across the wider APA asset base. The existing RCM program would see activities begin in the VTS in mid 2023 and run through to the end of 2023 and would cover fixed plant such as compressor stations, regulating and metering stations and offtake facilities, but exclude statutory pressure vessel, piping, PSV and hazardous area inspections.

4 Risk Assessment

Include a general description of the untreated risk(s) and a summary table of the results of the risk assessment.

TABLE 3: RISK RATING

Risk Area	Risk Level
Health and Safety	**LOW**
Environment	**LOW**
Operational	**MOD**
Customers	**N/A**
Reputation	**LOW**
Compliance	**LOW**
Financial	**NEG**
Final Untreated Risk Rating	**MOD**

The current maintenance strategy application presents a risk to reliable operation of VTS assets via elevated likelihood of unplanned failure of critical assets. It is credible for a lack of fit for purpose maintenance strategy to lead to compressor or delivery station unavailability of up to one month, thus impacting customers to the extent of capacity of that facility. Furthermore, plant unreliability through ineffective maintenance strategies draws on available resources to support reactive corrective maintenance rather than proactive preventative or predictive maintenance. Holistic maintenance strategy review will enable more effective online monitoring tasks to be adopted in lieu of some preventative activities thus minimising planned maintenance downtime and extending plant availability for operation

5 Options Considered

5.1 Option 1 – Do Nothing

Doing nothing would entail continuing with the current maintenance strategies for all VTS assets.

5.1.1 Cost/Benefit Analysis

The risks associated with this option is to accept the current level of reliability & availability leading to unplanned outages and the potential impacts to customers.

5.2 Option 2 – Complete RCM strategy development on VTS transmission assets

Apply RCM practices to develop fit for purpose maintenance strategies for the facility based APA operating assets in the VTS (excluding statutory pressure equipment, PSV and hazardous area inspections).

The specific objectives of this phase of RCM delivery at APA Transmission are to set the foundations and commence the APA Reliability-Centred Maintenance journey such that the first '80%' of the benefits can be captured by;

1. Specific Equipment Maintenance Strategy for all major asset types and classes represented in Maximo
2. Detailed Job Task Lists attached to each Job Plan/WO
3. Job Tasks grouped into PMs following standardised, logical process
4. Spread of work that aligns the strategy to the Work Zone operational constraints
5. Site-specific Work Instructions for Critical Loop tasks
6. Work Instructions for complex jobs – bias towards generic National WI

5.2.1 Cost/Benefit Analysis

What are the benefits of this option?

- Improved Reliability / Reduce Operational Risk
- Proactive execution of Maintenance
- Relevant/asset specific maintenance execution
- Better resource planning (focus on planned works by avoiding breakdowns)
- Industry Leading Practice

The costs involved with this option are summarised below;

Scope	Amount
VTS component of the initial RCM framework development/establishment/enablement costs (foundational work)	$500k
The RCM assessment and application for VTS assets	$1.75m

5.3 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	$0
Option 2	Complete RCM strategy development on VTS transmission assets	$2,250,000

5.4 Proposed Solution

5.4.1 What is the Proposed Solution?

Based on the benefits it provides, the selected option is to proceed with implementing the Reliability Centered Maintenance program for the VTS assets as outlined above

5.4.2 Why are we proposing this solution?

Nationally APA has a strategy to improve asset reliability whilst decreasing maintenance expenditure, the rationale for this is that we need to operate more efficiently in an increasingly competitive market. Reliability centred maintenance is an industry accepted method to achieve this objective and is a logical progression from optimised OEM maintenance schedules.

5.4.3 Consistency with the National Gas Rules

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

Prudent – The expenditure is necessary in order to maintain and improve the safety and reliability 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 selection of the appropriate timing for each facility uses a consistent and transparent decision process that balances risk and operating context to ensure that the best solution is implemented. Progress to date has demonstrated specific expertise in completing the inspection of the facilities 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 – RCM are proven tools used worldwide for implement efficient and effective maintenance strategies.

To achieve the lowest sustainable cost of delivering pipeline services – RCM is the most cost effective solution and a common approach for maintenance strategy programs. The proposed option uses a combination of asset criticality and best practices to prioritise the facilities and in doing so improves asset reliability and availability.

5.4.4 Forecast Cost Breakdown

Costs provided in table 5 are estimated based on RCM initiatives that are in flight at a national level. Costs are distributed across the APA asset pool based on the number of and complexity of assets.

TABLE 5: PROJECT COST ESTIMATE,

	Total
Internal Labour	**$1,462,500**
Materials	**$0**
Contracted Labour	**$787,500**
Other Costs	**$0**
Total	**$2,250,000**

There are 2 discreet phases for the VTS scope planned for this access arrangement period as outlined in table 6.

TABLE 6: PROJECT PHASES AND SCHEDULE

Scope	Timing	Amount
VTS component of the initial RCM framework development/establishment/enablement costs (foundational work)	May – June 2023	$500k
The RCM assessment and application for VTS assets	June – November 2023	$1.75m

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