Business Case

BCS Unit 12 Inlet Filter Upgrade

Business Case Number BC267 AA23-27

1 Project Approvals

TABLE 1: BUSINESS CASE – PROJECT APPROVALS

Updated By	Adam Newbury	Asset Lifecycle Specialist, Asset Management
Costed By	Prasoon Premachandran	Victorian Team Lead Project Delivery, Engineering & Planning
Reviewed By	Nicholas King	Mechanical Engineer, Engineering & Planning
Approved By	Daniel Tucci	Victorian Asset Manager, Asset Management

2 Background

Project resubmitted – delayed due to reprioritisation

The Brooklyn Compressor Station Unit 12 (BCS12) has a single process gas inlet filter. This filter was procured from another APA VTS compressor station (Bulla Park) to reduce cost of BCS12 installation in 2007.

The filter has consumable elements that require cleaning/replacement when they become fouled. In order to perform this maintenance activity, the vessel must be isolated from gas, depressurised, purged of hydrocarbons and then the confined space must be entered by a technician.

There are 5 main problems with the existing BCS 12 inlet filter:

- Availability of BC12 is lost whenever this filter requires cleaning as there is only one filter for the unit
- Maintainability of the filter is restricted by the performance of the isolation valves, should they pass gas the confined space atmosphere fit for human occupation cannot be maintained and thus the maintenance cannot be performed.
- Maintainability of the filter. The filter housing is difficult to clean due to the associated safety concerns. The means of confined space rescue is severely inhibited by design of entry and elevated platform.
- Performance of the filter is limited to 10µm whereas the standard APA design for inlet filters for process gas for Solar Turbine packages are 3µm and 99% efficiency for all solid and liquid particles greater than 1µm. This is the specification set by *Solar Turbines International*.
- Reliability of the compressor seal is influenced by the cleanliness of the process gas. A 10µm filter on the inlet side will result in larger particles being compressed with the process gas. 'Dirty gas' has contributed to dry seal failures for gas compressors nationally. The result is an immediate shutdown with a loss of plant up to least six weeks.

Project need is driven by OEM.

3 Risk Assessment

The primary risk scenario considered is contaminated gas passing the existing filter, damaging the compressor dry seals and causing a significant outage while repaired.

TABLE 2: RISK RATING

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

4 Options

4.1 Option 1 – Do Nothing

The Do Nothing option is to continue operating a filter-coalescer without safe means of cleaning. The reasonably clean gas that is being delivered to the BCS12 and that the filter elements are incorrectly sized is the only reason why this filter remains in operation. To simply replace the elements with elements that would collect 3µm particles will result in the filter requiring frequent cleaning/replacement.

The Do Nothing option risks damage to the compressor. Currently we are relying on reasonably clean gas to prevent the immediate need for replacement. The Do Nothing option is no longer technically acceptable.

BCS12 is not operating within OEM specifications.

4.2 Option 2 - Proposed Solution - Replacement of the BCS12 Filter

The replacement of the filter vessel with an APA standard design, consistent with compressor manufacturer requirements, is the most appropriate solution to the current maintainability, safety and performance problems.

4.2.1 Why are we proposing this solution?

The existing arrangement of poor filtration performance is masking the maintainability problem. In order to achieve full service life from the turbine driven compressor, adequate filtration must occur. A known problem with 'dirty gas' destroys dry seal compressors. Seal failure will cost approximately $300,000 to repair and take a unit offline for approximately six weeks. The result would be the primary compressor at Brooklyn being out of service for an unacceptable period of time.

The pressure vessel has been assessed as a confined space. Some of the major hazards to a confined space are the atmospheric conditions and means of escape. Both of these hazards are not mitigated effectively to enable maintainability and provide a safe environment for APA personnel.

4.2.2 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 the integrity of services to customers and safety to 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 procurement will be undertaken consistent with the APA procurement policy. The design of the new vessel will be in accordance with the APA standard design. 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 process performance and dry seal failure is accepted as good industry practice. The replacement of assets that do not comply with confined space entry and exit procedures to lower the 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.

4.2.3 Forecast Cost Breakdown

TABLE 3: PROJECT COST ESTIMATE

	Total
Internal Labour	$150,437
Materials	$218,494,
Contracted Labour	$266,788
Other Costs	$0
Total	**$635,719**

Costs have been estimated based on a similar installation in NSW.

5 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