# Business Case – Capital Expenditure

# BCS IA Reliability Upgrade

## Business Case Number 208

## 1 Project Approvals

**TABLE 1:** BUSINESS CASE – PROJECT APPROVALS

| | |
|---|---|
| **Prepared By** | Anthony Jones, *Pipeline and Asset Management Engineer, APA Group* |
| **Reviewed By** | Arvin Basdeo, *Pipeline 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** | The BCS has multiple valves and other equipment powered by instrument air. The air system has become undersized for the additional incremental loads placed on it creating a station reliability problem as the undersized piping can lead to fail-safe actuation of critical components. |
| **Options Considered** | The following options have been considered:<br>1. Option 1: Do Nothing Option<br>2. Option 2: Increase IA storage<br>3. Option 3: Augment the existing Instrument Air piping |
| **Estimated Cost** | $98,950 |
| **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:<br>• 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<br>• 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 relates to this project are:<br>• Australian Energy Market Operator |

## 3 Background

The Brooklyn Compressor Station contains no less than five turbine driven compressors and multiple City Gate pressure reduction systems. The station has been built progressively since the 1970's and each project has utilized the Instrument Air (IA) available. The IA system consists of an air compressor, wet air receiver, dryer, dry air receivers, pressure regulation and piping.

The piping of the IA is now undersized for the loads placed on it. This creates a situation where the Fail Safe actuators will actuate to the fail-safe position when the instrument air pressure at the actuator falls below a prescribed minimum. The result of this is a compressor shutdown.

# 4 Risk Assessment

The risks associated with the current IA design are the likelihood of unit shutdown when the load on the IA system is high. These occurrences will reduce system capacity.

**TABLE 3:** RISK RATING

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

# 5 Options Considered

## 5.1 Option 1 – Do Nothing

The Do Nothing option is to allow the system capacity to be reduced when an IA event occurs. The deferral of small cost is the only benefit to this option.

## 5.2 Option 2 – Construct Dry Air Receiver for IA storage

This option is to construct a dry air receiver large enough to be able to withstand either an air compressor failure or temporary high flow rate.

### 5.2.1 Cost/Benefit Analysis

- The benefits of this option are that the reliability of the air compressors will not significantly affect the reliability of the IA system.
- The design difficulty of this option is the location of the receiver will need to be in a location where it can feed the IA ring main sufficiently to prevent pressure drop across the piping during high demand periods.
- The other major design difficulty of this option is the receiver will need to be extremely large and unlikely to be cost effective compared to other solutions.

## 5.3 Summary of Cost/Benefit Analysis

**TABLE 4:** SUMMARY OF COST/BENEFIT ANALYSIS

| Option | Benefits (Risk Reduction) | Costs |
|---|---|---|
| Option 1 | Do Nothing | |

| | | |
|---|---|---|
| Option 2 | Augment IA storage capacity | $300,000+ |
| Option 3 | Augment IA piping system | $98,950 |

## 5.4 Proposed Solution

### 5.4.1 Augment IA piping system and construction of new compressor

The most cost effective means of improving reliability of the BCS IA system is to mitigate the reliability problem. This can be achieved by installing cross overs and looping pipework for the IA system to eliminate the pressure drop effects during high demand periods that would otherwise create unnecessary plant shut downs.

### 5.4.2 Why are we proposing this solution?

The BCS and the associated City Gate stations supply most or all of the gas consumed by Geelong, Ballarat, Bendigo and the Western Transmission System.

Allowing the reliability of the entire station to be influenced by a simple compressed air service is unacceptable. The only other service that the entire station relies on is electricity. In contrast to the IA system the electrical system has backup systems in the event of the failure of the primary source (electricity grid).

An unnecessary trip of the entire station would result in up to five compressors shutting down, multiple city gates activating fail-safe (monitor) settings resulting in substantial reduction in system capacity and control.

### 5.4.3 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 would avoid the compressor station and city gate failure as a result of IA system failure and therefore is necessary to 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 a suitably qualified external contractor in a safe and cost effective manner. 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 process services such as instrument air is accepted as good industry practise. 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.

### 5.4.4 Forecast Cost Breakdown

The project includes the additional air pipework to loop parts of the existing system and removal of check valves.

**TABLE 5:** PROJECT COST ESTIMATE,

| | Total |
|---|---|
| Internal Labour | **$22,193** |
| Materials | **$14,235** |
| Contracted Labour | **$57,355** |
| Other Costs | **$0** |
| **Total** | **$93,783** |