Business Case – Capital Expenditure

Unibolt Upgrade
Business Case Number 277

1 Project Approvals

TABLE 1: BUSINESS CASE – PROJECT APPROVALS

Prepared By	Anthony Jones, *Pipeline and Asset Management Engineer, APA Group*
Reviewed By	Glenn Ogilvie, *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 Unibolt enclosure has a significant design flaw which unnecessarily exposes operators to high velocity vented gas when operated. The program of upgrade is continuing and should be complete by 2020.
Options Considered	The following options have been considered: 1. Option 1: Do Nothing Option 2. Option 2: No Alternate Identified 3. Option 2: Upgrade of Unibolt program to continue
Estimated Cost	$222,320
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 relates to this project are: • Energy Safe Victoria • APA operators and technicians

3 Background

The purpose of the Unibolt closures is to provide a quick-opening vent point to blowdown a section of pipeline, in the event of an emergency by a Pipeline Operator, without the needs of using special tools or having to waste precious time by detouring to the nearest depot to pick up special tools before attending the site.

A quick opening mechanism on a pipeline blow down point such the Unibolt closure design is no longer considered desirable and safe to operate. As such they are no longer a component used in newly constructed pipelines.

APA has been implementing a program of upgrade of all Unibolt enclosures over the last few years. The remaining Unibolt enclosures are listed in the below table.

TABLE 3: UNIBOLT ENCLOSURES

Location	Quantity
Pakenham Site	1
T061-LV03	2
T061-LV04	2
T061-LV05	2
T061-LV06	2
T061-LV07	2
Wollert Site	1

4 Risk Assessment

TABLE 4: RISK RATING

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

The inability for operators to attach a vent stack to a Unibolt enclosure forces the operator to release gas whilst in the hazardous zone. This intensity of the heat generated in this zone should vented gas ignite would be too high for an operator to remove themselves from the heat and would result in a fatality.

The Unibolt arrangement on line valves does not allow blowdown of gas in an emergency as specified in APA's pipeline isolation plans.

The design of these enclosures does not permit water to be drained from the sealing cavity, causing corrosion which prevents adequate sealing of gas. This results in a continuous leak of gas on most of the installed Unibolts within the VTS.

5 Options Considered

5.1 Option 1 – Do Nothing

The installed Unibolt closure on pipeline cannot provide a safe pipeline venting point for the operators that initiate the venting process. The following hazards are explained:

1. The major design failure of the installed Unibolt closure design is that there is no provision for a safe means both structural strength and pressure containment, of attaching an extension to the Unibolt closure. High gas velocity and high reactive forces are expected during major blowdown and any venting extension must have adequate structural support.
2. The installed Unibolt closures are at head height and adjacent to the valve that needs to be operated to control venting. Without the ability to extend the vent point to a safe place away from the Operator, controlling the venting is a major hazard. The Operator would be located:

   -in a high noise environment (ear protection can be used but would lead to ineffective communication with others)

   -adjacent to a high velocity gas

   -in a hazardous gas cloud area and fatal heat radiation zone if the vent gas is ignited.

3. As the Unibolt closures are installed upright (as compared to horizontal on installations such as pig traps), it provides a natural recess to trap rainwater and dirt. Some Unibolt closures have developed significant rusting on the collar of the door resulting in significant metal loss and are beyond the point of a mere rust treatment

The Unibolt closures rely on a good seal and the holding mechanism to contain gas pressure. The replacements seals for the installed Unibolt are no long available and past experience has shown good sealing is hard to achieve using non-proprietary seals and resulted in weeping gas leak. The rusting on the collar and the door itself may be effecting the sealing surfaces in providing a tight seal. Field technicians who have worked with the Unibolt closures in the past are hesitant to open the closures as re-sealing is a known problem.

Picture shows the Unibolt enclosures ability to hold water and corrode.

5.1.1 Cost/Benefit Analysis

The Do Nothing option is to delay capital expenditure and accept the risks of the remaining Unibolt enclosures.

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 alternative identified	
Option 3	Proposed Upgrade	$222,320

5.3 Proposed Solution – Upgrade of Unibolts

5.3.1 What is the Proposed Solution?

The proposed solution is to replace the entire Unibolt with a weldneck flange and blind flange with bleed point.

This solution enables a variety of vent stack designs to be attached to the weldneck flange. This setup allows for the existing valves that control venting to be operated at a safe location.

This approach to Unibolt upgrades has been successful and the program for completion is expected to continue until 2020.

5.3.2 Why are we proposing this solution?

It is critically important that we justify ***why*** we are proposing the solution, compared to the other options detailed. Without appropriate justification, the project is unlikely to be approved by the AER.

This section should include a discussion on:

- The technical/engineering explanation as to why we are proposing this option;
- The results of the options analysis; and
- Justification of this project through the National Gas Rules (contained specifically within Section 5.5.3).

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 to 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 completing the installation 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 – Addressing the risks associated with venting gas and replacing assets that are of inferior design 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.

5.3.4 Forecast Cost Breakdown

The Unibolt project has been an ongoing program of work for at least five years. The costs for the above detailed works are based on the actual costs experiences on other Unibolt replacement locations. The costs are accurate and a true reflection of the works.

TABLE 5: PROJECT COST ESTIMATE,

	Total
Internal Labour	$63,520
Materials	$41,600
Contracted Labour	$117,200
Other Costs	$0
Total	**$222,320**