NETWORK PLANNING REPORT – T004

WARRAGUL (Timing)

March 2007

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Executive Summary

The increasing loads along the Lurgi (Morwell-Dandenong) pipeline, raises the prospect of delivery pressures falling below the 1,400 kPa minimum pressure obligation at Warragul.

This report assesses the impact brought about by the increase in demand:

- from residential and commercial developments in the Pakenham and Warragul area; and
- at the Dandenong Terminal Station supplying gas around Dandenong and the surrounding areas.

The report presents a network planning view for the maintenance of the minimum pressure obligation at Warragul, a lateral connected to the Lurgi pipeline. The report uses historical data, demand forecasts, and the Gregg Engineering model of the Principal Transmission System (PTS) to predict the year delivery pressures are likely to fall below the minimum pressure obligation.

The modelling results indicate that a breach in the minimum pressure obligation is likely to occur at Warragul under 1 in 20 peak day conditions during 2009.

Introduction

The Warragul lateral is connected to the Lurgi pipeline approximately 67 km east of the Dandenong City Gate (CG). Figure 1 shows the Longford and Lurgi pipeline schematics. As well as being a residential area, Warragul is the site for a large commercial customer that uses a significant quantity of gas and has proposed to expand its production, which would lead to a subsequent increase in load. A meter upgrade has been approved for Warragul, scheduled for commissioning prior to winter 2007, to accommodate this additional flow.

This report presents a:

- review of historical demand and delivery pressures for the Warragul lateral for the period 2000–2005; and
- brief analysis of the forecast demand [1] and delivery pressures for the period 2007–2010.

The report also identifies a specific year beyond which delivery pressures on a winter peak day are likely to fall below the minimum pressure obligation.

[1] These cases include and exclude the proposed expansion of the large commercial customer.

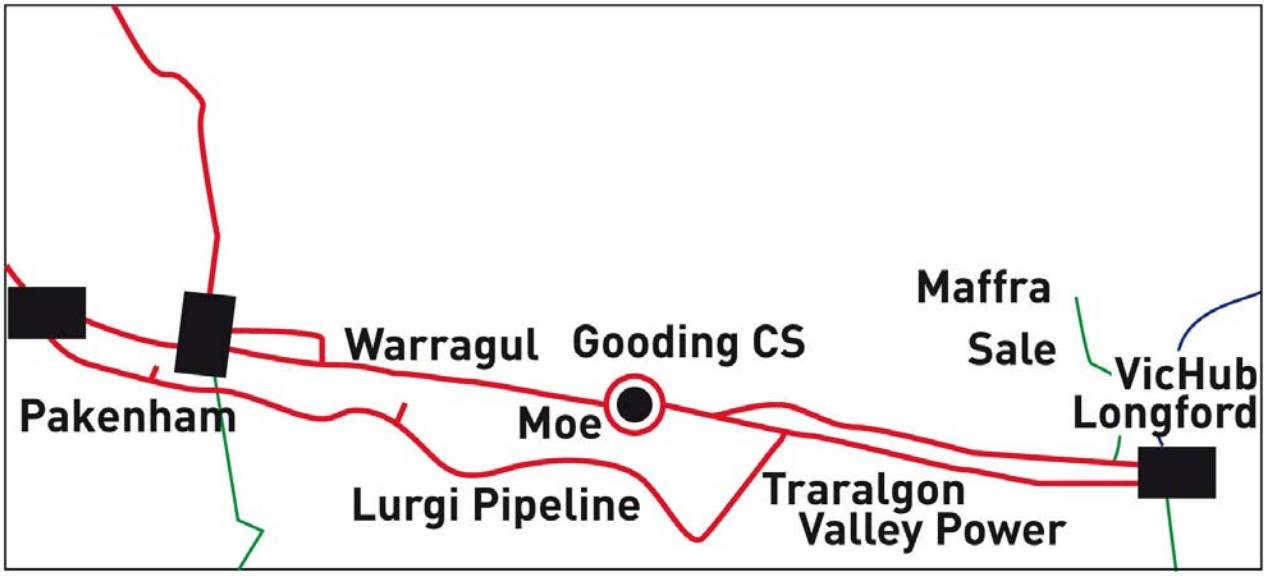
Planning Inputs

Table 1 lists the key planning inputs used in the modelling.

Table 1 – Key planning inputs

Item	Detail
Forecast demand data	Supplied by OEAM and Alinta and 2005 Gas APR [2]
Historical data	Extracted from VENCorp's TADIS database
Modelling software	Gregg Engineering WinFlow version 4.060503 Gregg Engineering WinTran version 4.060505
Model of PTS used	Common Model version 2006

Figure 1 - Longford and Lurgi pipeline schematics



[2] The 2005 report represents the latest information available at the time of the analysis. A later review of 2006 demand found that changes in the demand forecasts were minor and have no material impact on the timing and nature of the augmentations.

Assessment

Historical Demand and Minimum Pressure Review

Warragul's minimum pressure obligation is 1,400 kPa. Warragul's lowest recorded pressure was 1,622 kPa, at 11am on 7 May, 2001. Figure 2 shows the hourly demand, and Figure 3 shows the hourly pressure, at Warragul on the lowest pressure days (not necessarily the highest demand days), for each year from 2000–2005.

Figure 2 - Historical demand profiles, Warragul 2000-2005

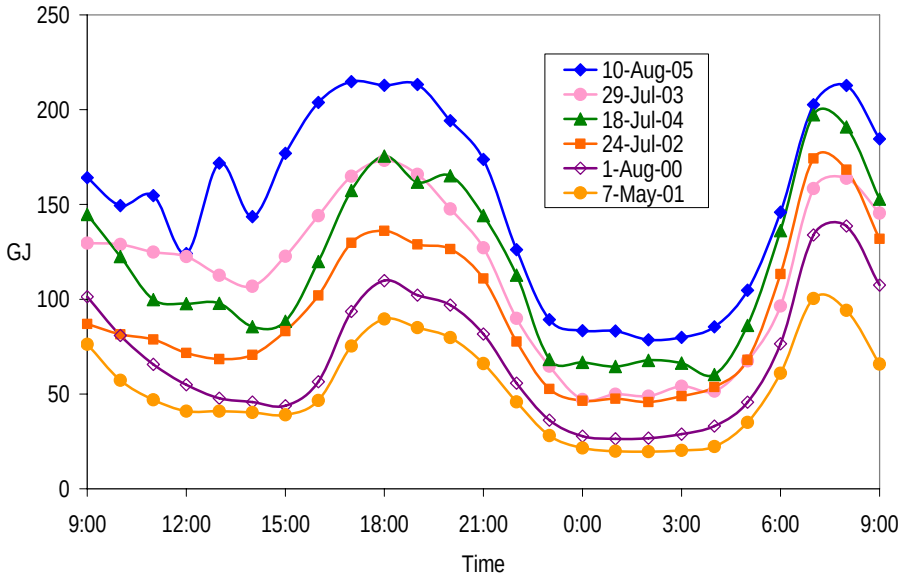
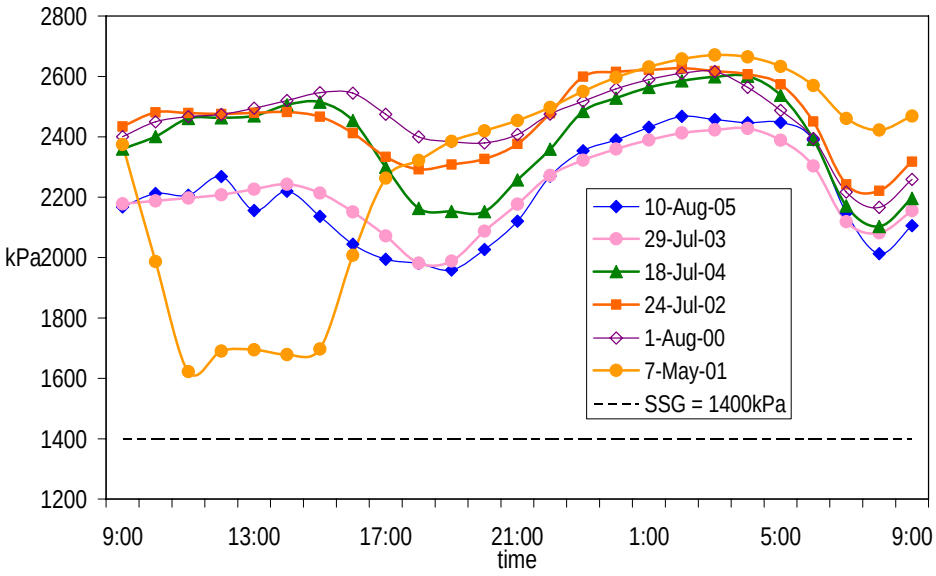


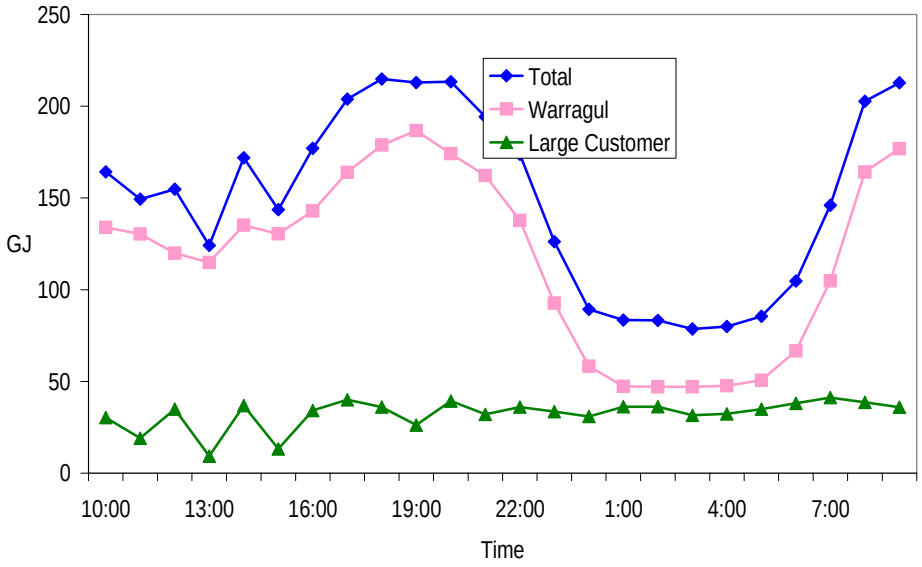
Figure 3 - Historical pressure profiles, Warragul 2000-2005



The lowest pressure day in the last five years occurred on 7 May, 2001. Figure 3 shows that this pressure was not demand-driven, and was probably caused by a closed line valve, so this day can be disregarded. The next lowest pressure of 1,958 kPa occurred on 10 August 2005. Though well above the minimum pressure obligation, a recently committed expansion of a large commercial customer requires further assessment.

Figure 4 shows the demand profiles at Warragul for residential, commercial, and overall demand on 10 August 2005.

Figure 4 - Warragul demand, 10 August 2005



Forecast Demand

The 1 in 20 winter peak day demand for 2006–2010 was established using forecast data provided by the relevant Distribution Business (DB), together with the system demand forecasts included in the 2005 Gas APR. Table 2 lists the historical and forecast demands at Warragul and nearby off-takes from the Lurgi pipeline. The expansion of the large commercial customer at Warragul is not included.

Table 2 - 1 in 20 historical and forecast winter peak day demand (TJ)

Location	2002	2003	2004	2005	2006	2007	2008	2009	2010
DTS (Lurgi)	51.88	52.95	32.93	48.83	57.20	57.20	57.20	55.73	55.73
Lyndhurst	0.34	0.58	0.74	0.93	0.93	0.94	0.94	0.95	0.95
Clyde North	0.36	0.27	0.52	0.36	0.36	0.37	0.37	0.37	0.37
Pakenham South	3.39	3.68	4.37	4.37	4.37	4.42	4.44	4.46	4.46
Warragul	2.78	2.87	2.92	3.84	3.84	3.98	4.10	4.22	4.30
Moe	2.75	3.03	3.19	3.20	3.20	3.24	3.25	3.27	3.26

Figure 5 shows the growth in peak days forecast for Warragul and the surrounding area.

Figure 5 - 1 in 20 winter peak day demand, 2002–2010

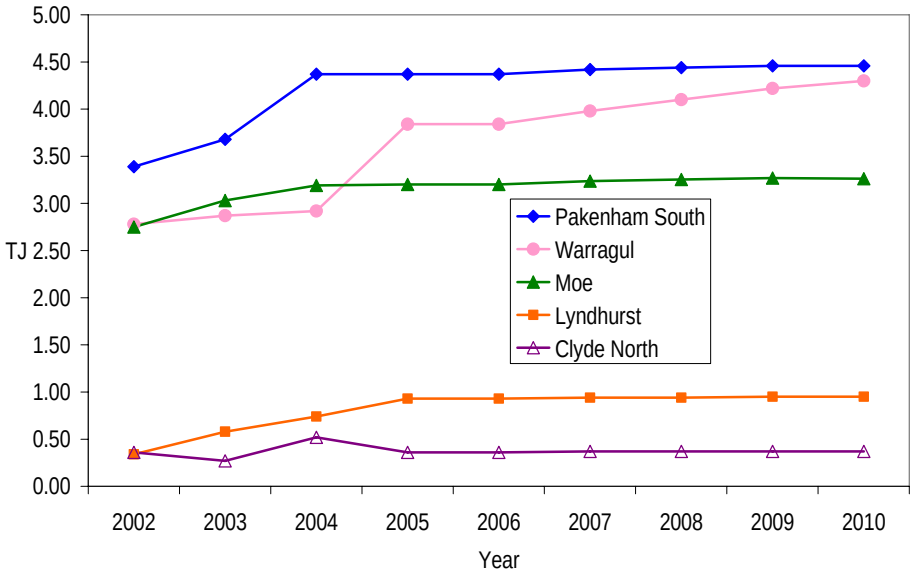


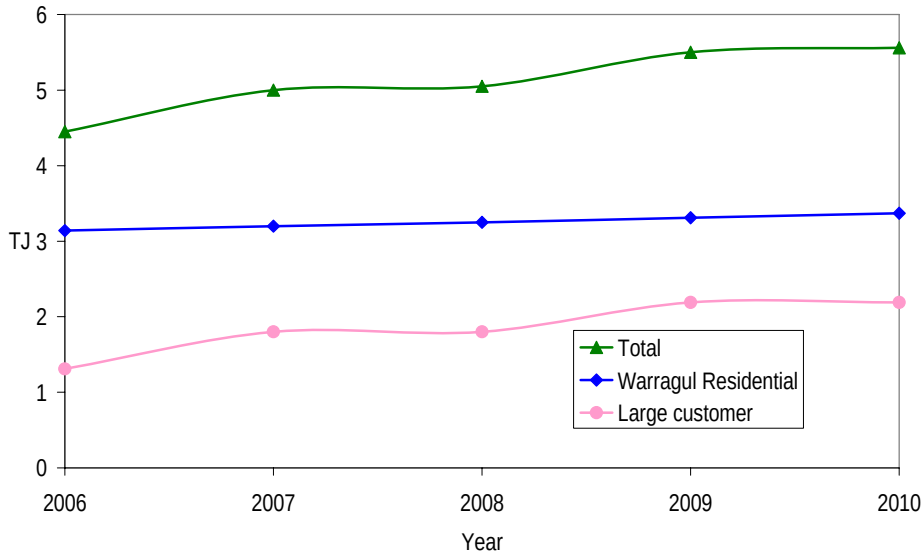
Table 3 lists the forecast load for the town of Warragul, with the proposed expansion of the large commercial customer. This proposed expansion creates significantly higher Warragul load than previously forecast.

Table 3 - 1 in 20 peak day demand forecast, including expansion (TJ)

Year	2006	2007	2008	2009	2010
Warragul	3.14	3.20	3.25	3.31	3.37
Large Customer	1.13	1.80	1.80	2.19	2.19
Total	4.27	5.00	5.05	5.50	5.56

Figure 6 shows the forecast load under the same circumstances.

Figure 6 - 1 in 20 peak day demand forecast, including expansion (TJ)



Modelling Assumptions

The latest Gregg Engineering model was used to forecast delivery pressures incorporating all proposed new connection points.

The modelling assumptions include the following:

- Forecast demand for all locations as per the VENCorp customer transfer meter (CTM) peak day forecast.
- Hourly demand profiles for Warragul are based on the actual demands recorded during 10 August, the peak day for 2005 (see Appendix 1).
- Jeeralang is assumed to be operating at a flat rate throughout the day (although this is unlikely on a 1 in 20 day, it is nevertheless included as a worst-case scenario).
- Morwell City Gate (CG) pressure is set to 2,760 kPa and the Morwell back-up regulator is set to 1,800 kPa.
- Full availability of transmission assets is assumed, with no forced outages.

The Gregg Engineering modelling was performed for the period 2007–2009.

Results Analysis

Table 4 lists the modelling results.

Table 4 - 1 in 20 winter peak day forecast pressures (kPa)

Location	Minimum Pressure Obligation (kPa)	2007	2008	2009
Lyndhurst	1,400	1,743	1,742	1,746
Clyde North	1,200	1,793	1,792	1,795

Pakenham	1,400	1,668	1,664	1,663
Warragul	1,400	1,495	1,486	1,339
Moe	1,400	2,450	2,449	2,448

Conclusion

The growth in demand along the Warragul branch will increase the likelihood that connection pressures will fall below the minimum pressure obligation.

The modelling results conclude that a breach in the minimum pressure obligation is likely to occur at Warragul under 1 in 20 peak conditions in 2009.

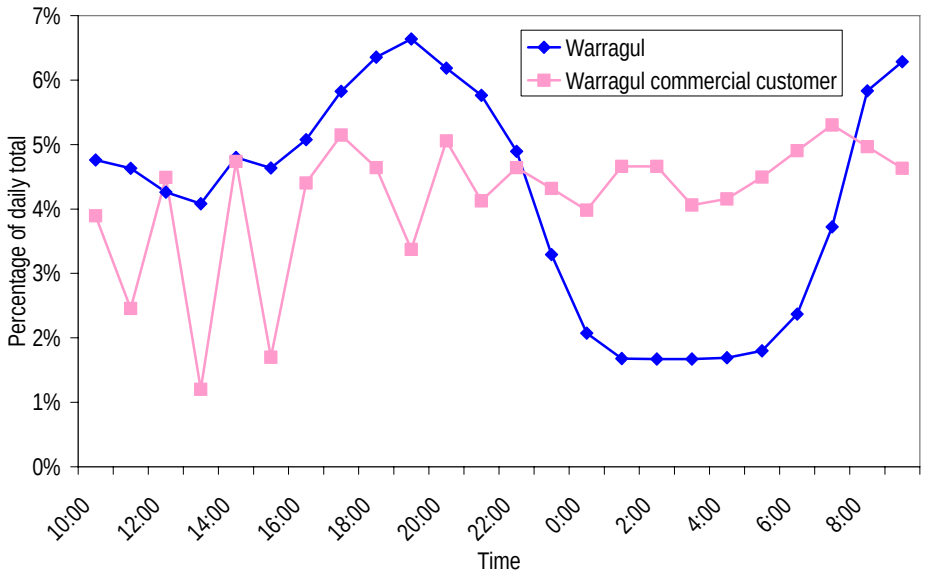
Definitions

CG	City Gate.
DB	Distribution Business; a distribution pipeline network operator.
DB Connection Deed	An Agreement between VENCorp and a Distribution Business.
DCG	Dandenong City Gate, from which gas leaves the transmission system and enters the distribution system at Dandenong.
Gas APR	Gas Annual Planning Report, published by VENCorp by 30 November each year.
Minimum Pressure Obligation	The minimum pressure obligation stipulated in the System Security Guidelines and/or Distribution Business Connection Deeds that VENCorp must operate the system to maintain.
OEAM	Origin Energy Assets Management
PTS	The Principal Transmission System, serving Gippsland, Melbourne, Central and Northern Victoria, Albury, the Murray Valley region, Geelong, and the western region of Victoria. The PTS is owned by GasNet and operated by VENCorp.
SSG	System Security Guidelines, developed and maintained by VENCorp, for the operation and security of the PTS.

APPENDIX 1

Figure 7 shows the hourly demand profiles (expressed as a percentage of the daily total) for Warragul and Warragul's large commercial customer on 10 August 2005, as used for the modelling.

Figure 7 - Warragul profiles, Warragul town and large commercial customer



The two demand profiles do not generally appear to peak at the same time.