Significant price variation report

Adelaide STTM
21 November 2016

31 March 2017

AUSTRALIAN ENERGY REGULATOR

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Introduction

In accordance with the *National Gas Rules*, the AER is required to publish a report whenever there is a significant price variation **(SPV)** in the Victorian gas market or Short Term Trading Markets **(STTM)**.[1] The AER has published guidelines setting out what constitutes a SPV event[2].

Outcomes that constitute a SPV event include when the daily cost of Market Operator Services (MOS), at a STTM hub, exceeds $250,000. On 21 November 2016, MOS gas was required for the Adelaide hub. The MOS service payment ($367,334) was a record for the hub, breaching the AER's reporting threshold.

MOS is a balancing service used to balance the gas scheduled on a pipeline with the actual volumes of gas that have flowed on that pipeline.

1 The obligation is set out in the National Gas Rules. Rule 498(3)(b) relates to SPVs in the Short Term Trading Markets, and rule 355(1)(b) relates to SPVs in the Victorian market.

2 The AER has established thresholds that, when breached, trigger an SPV report. These thresholds are noted in Appendix B.

Summary

On 21 November, MOS payments were generated across the two transmission pipelines that service the Adelaide hub. This included increase MOS on the Moomba Adelaide Pipeline **(MAP)** and decrease MOS on the SEA Gas pipeline. This increase MOS and decrease MOS is collectively known as counteracting MOS. A description of counteracting MOS and its incidence at the Adelaide hub is provided at **Appendix A**.

The AER previously reported on high counteracting MOS, at the Adelaide hub, during the winter of 2013. On 25 June 2013, a high MOS service payment breached the AER's reporting threshold, triggering a SPV report. The report highlighted a trend in high counteracting MOS across July and August of that year. Subsequent to these events, average daily MOS volumes and payments declined across 2014 and 2015 along with the incidence of counteracting MOS.[3] However, across the 2015 to 2016 calendar years, average daily MOS volumes increased by 35 per cent. MOS payments and incidences of counteracting MOS also increased.[4]

This report concludes that several factors aligned to produce large volumes of counteracting MOS on 21 November 2016. Based on the information that we have obtained, the AER does not consider that these volumes are attributable to any market participant being in breach of the Gas Rules.

The report identifies the heightened potential for counteracting MOS when the volume of gas supplied to the hub from the MAP is significantly lower than volumes supplied by the SEA Gas pipeline. It also identifies the key role of pressure differentials at pipeline delivery points, concluding that SEA Gas pipeline injections were pressured out of the Adelaide hub by MAP injections on 21 November 2016.

This report also observes that MOS payments for the Adelaide hub have been relatively small during the first quarter of 2017. As such, the event of 21 November 2016 did not signal ongoing growth in the incidences of counteracting MOS or the size of MOS payments. The AER will not conduct further analysis of the events of 21 November but will continue to monitor MOS volumes including counteracting MOS volumes in Adelaide.

3 Defined to be days of simultaneous amounts of positive and negative MOS exceeding 5 TJ.

4 The average daily MOS payments increased by 59 per cent. Occasions of counteracting MOS in excess of 2 terajoules (TJ) increased from 25 to 57. Counteracting MOS of 5 TJ implies 2.5 TJ of increase MOS on a pipeline and a corresponding 2.5 TJ of decrease MOS on the other pipeline (see Appendix A).

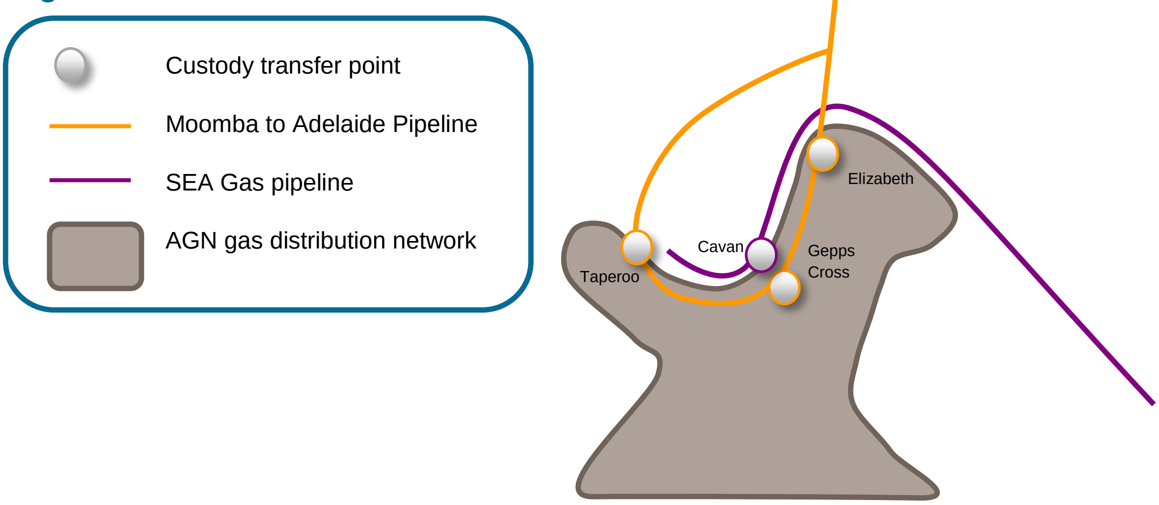
1 The Adelaide Hub and MOS Gas

1.1 Network configuration and injections

The Adelaide hub commenced operation on 1 September 2010.[5] The hub has delivery points (custody transfer points) where the two transmission pipelines, that supply the Adelaide market, meet the distribution network. The SEAGas pipeline has one delivery point at Cavan. The MAP has three delivery points, located at Elizabeth, Gepps Cross and Taperoo. The distribution network is owned by Australian Gas Networks, a subsidiary of Cheung Kong Group. It is operated by APA Asset Management.

Figure 1 illustrates the MAP and SEAGas pipelines, their respective custody transfer points, and the Adelaide distribution network.

Figure 1 – The Adelaide hub



As **Figure 1** shows, all delivery points for the Adelaide hub are located along the northern edge of the distribution network. Whether it is supplied by the MAP or SEA Gas pipeline, gas enters the distribution system from the north before balancing within the network. How it balances depends on gas pressures and the physical design of the network.

1.2 Distribution network flows

Whilst MAP injections can occur at three delivery points, SEA Gas injections are limited to the central point at Cavan and flow through the network from that location. As a consequence, SEA Gas flows lose pressure as they access the extremities of the network, including the northern extremities at Elizabeth and Taperoo. This means that MAP deliveries can over-compensate, creating a gas balance (within the distribution network) that is not consistent with the scheduled deliveries from each transmission pipeline.

[5] At the same time, a hub in Sydney also commenced. A hub in Brisbane joined the STTM on 1 December 2011.

The balancing gas that can accrue (increase MOS gas on the MAP and decrease MOS gas on SEA Gas) is a case of MAP flows ‘pressuring-out’ SEA Gas flows within the distribution network. The departure from the market schedule can generate large counteracting MOS payments.

This is further explained by the technical characteristics of the MAP as a ‘pressure control’ pipeline. This means that MAP injections maintain (regulate) pressure within the Adelaide distribution network. SEA Gas injections will alternate between flow control and pressure control: controlling volumes to meet schedules (flow control) or regulating injections (pressure control) according to the distribution network’s operating requirements.

1.3 Daily pipeline schedules

Historically, the requirement for significant volumes of balancing gas has most commonly occurred when there is a large differential between the scheduled flows to the hub from the two pipelines (low volumes on the MAP compared to the SEA Gas pipeline). When low volumes are scheduled on the MAP, its technical characteristics (a pressure control pipeline, with three distribution network delivery points) encourage above schedule injections. Additional MAP gas may enter the distribution network as balancing gas, supplanting SEA Gas pipeline flows. If significant volumes are scheduled from the SEA Gas pipeline compared to the MAP, a significant volume of MOS gas may accumulate.

1.4 Hourly pipeline schedules

The extent of the balancing gas requirement is influenced by hourly pipeline schedules. The daily profile of the SEA Gas pipeline commonly sees injections increase throughout the day toward a late afternoon demand peak. When flows from the SEA Gas pipeline are pressured-out of the distribution network during the day, the lag on its injections can persist throughout the day, despite in-built mechanisms that should allow it to catch-up to its schedule. In this case, the SEA Gas pipeline experiences a shortfall on its schedule, meaning there is an accrual of balancing gas.

In 2012, AEMO concluded that the primary cause of counteracting MOS in Adelaide was the hourly profile nominated by shippers on the SEA Gas pipeline; specifically, that an hourly lag prompted increased injections from the MAP. AEMO concluded that the isolation of the Elizabeth sub-network (see below) was a secondary contributor to high counteracting MOS.

1.5 Elizabeth valve

Prior to 2014, SEAGas pipeline flows were wholly isolated from the Elizabeth sub-network due to a closed valve. This meant that Elizabeth demand was met solely by the MAP. During 2013 the then owner/operator of the Adelaide distribution network (Envestra) was modelling the benefits of opening the valve, which had remained closed to help Envestra manage pipeline flows. The opening of the valve was, in part, proposed to mitigate against requirements for MOS balancing gas.

At the time, analysis by APA Group determined that there was reduced operational need to keep the Elizabeth valve closed. The valve was reportedly closed to maximise the capacity of the distribution network and to protect pressures in the southern parts of that network. APA concluded that, due to changes to demand profiles and augmentation works, the valve could be opened without adversely impacting on pressures across the network. The Elizabeth valve was opened the following year.[6]

6 In its analysis of the events of 25 June 2013 the AER found no link to demand forecasting inaccuracies. The difference between forecast demand and actual hub demand was small.

2 Previous High MOS Events

2.1 25 June 2013

The AER previously reported on a high counteracting MOS event, at the Adelaide hub, during the winter of 2013. The AER's SPV report, on the 25 June event, concluded that the high counteracting MOS was primarily driven by the isolation of the Adelaide distribution system's Elizabeth sub-network.

In its analysis of the winter of 2013, the AER identified a pattern of increased counteracting MOS during days of low flows to Adelaide on the MAP compared to the SEA Gas pipeline. This is consistent with the scenario in which SEA Gas pipeline injections lose pressure as they progress through the distribution network, triggering additional flows from the MAP. In this case, the MAP (as a pressure control pipeline) will maintain pressure within the Adelaide distribution network, consequentially pressuring-out SEA Gas pipeline injections from parts of the network, including from Taperoo.

The AER also identified that, during July and August 2013, high counteracting MOS coincided with above average demand at the Adelaide hub. Specifically, on 25 June 2013, the high counteracting MOS requirements coincided with high demand within the Elizabeth zone. It also coincided with a day of low nominations on the MAP. Demand within the Elizabeth zone in fact exceeded nominations on the MAP. Given the Elizabeth zone's reliance on supply from the MAP, this necessitated the need for a large volume of balancing gas.

2.2 Post 2013

Since the high-price event of 25 June 2013 (up to 1 March 2017), there have been 22 instances of MOS payments in excess of $100,000. None breached the AER's $250,000 reporting threshold until the 21 November 2016 event.

During the 2013 calendar year, the average daily MOS payment was $14,979. During the 2014 and 2015 calendar years, the daily average was lower at $12 340 and $11 992 and the payment exceeded $100,000 on 4 occasions each year. During the 2016 calendar year, the daily average increased to $20,158 and MOS payments exceeded $100,000 on 16 occasions.

3 High MOS in 2016

Whilst the opening of the Elizabeth valve seemingly played a role in reducing the incidence of counteracting MOS across 2014 and 2015, the AER has continued to monitor for any re-emergence of trends in high counteracting MOS at the Adelaide hub. The high MOS event on 21 November 2016 was part of a trend toward higher MOS payments across 2016 compared to the preceding two years.

Table 1 shows the 16 days in 2016 where MOS payments exceeded $100 000. It includes hub demand and volumes of increase MOS on the MAP and decrease MOS on the SEA Gas pipeline. The days are listed from highest to lowest MOS payment.

Table 1 – MOS payments exceeding $100 000 during 2016

Date	MOS Payment	MAP MOS	SEAGas MOS	MAP Scheduled (allocation)	SeaGas Scheduled (allocation)	Hub Demand	Daily Average (for month)
21/11/2016	$367,334	21	-22	12 (2)	39 (44)	45	53
28/09/2016	$188,274	5	-17	23 (15)	54 (56)	60	74
12/06/2016	$179,697	12	-18	13 (9)	60 (65)	68	80
4/09/2016	$178,717	12	-13	9 (10)	55 (55)	64	74
31/10/2016	$141,993	10	-15	18 (13)	52 (52)	60	58
*26/12/2016**	*$130,099*	*-7*	*0*	*16 (10)*	*18 (19)*	*21*	*44*
11/06/2016	$125,727	10	-13	9 (4)	60 (65)	66	80
8/09/2016	$124,149	7	-13	3 (10)	66 (60)	64	74
1/11/2016	$120,176	10	-13	16 (15)	50 (51)	63	53
*27/04/2016**	*$117,562*	*-10*	*0*	*29 (32)*	*26 (26)*	*47*	*52*
20/05/2016	$116,738	11	-12	0 (0)	62 (62)	61	62
14/11/2016	$115,878	11	-11	21 (14)	41 (48)	63	53
6/09/2016	$108,787	8	-10	5 (13)	63 (57)	68	74
29/09/2016	$108,430	12	-5	37 (58)	49 (25)	89	74
20/11/2016	$107,531	12	-9	7 (3)	31 (33)	39	53
2/11/2016	$103,505	10	-11	14 (13)	50 (50)	62	53

***** ***Not Counteracting MOS related***

3.1 Change to trend

The AER's SPV report on the events of 25 June 2013 found that high MOS payments over winter 2013 typically accrued on days of high demand at the Adelaide hub. However, as **Table 1** shows, the 16 highest MOS payments for 2016 have no pattern of coincidence with high demand at the hub. Across the 16 days in which MOS payments exceeded $100 000 there was no corresponding trend in demand above the monthly average. On 11 of the 16 days, hub demand was below the average daily demand for that month.

This can be explained by the opening of the Elizabeth valve in 2014. The opening of the valve mitigated against the need for increase MOS on the MAP when nominations on the pipeline were low alongside high demand within the Elizabeth sub-network. This may explain the reduction in occurrences of high counteracting MOS across 2014/15.

3.2 Continuation of trend

Historically, there has also been a correlation between the accrual of high counteracting MOS and low injections from the MAP compared to the SEA Gas pipeline. **Table 1** shows this is a continuing trend. Among the days in 2016 where MOS payments were in excess of $100 000, a clear majority of payments occurred on days of low scheduled injections from the MAP compared to the SEA Gas pipeline.

This continuing trend can be explained by the aforementioned physical characteristics of the Adelaide distribution network, including the potential for SEA Gas pipeline flows to be pressured out toward the extremities of the system. The opening of the Elizabeth valve does not directly address this outcome and SEA Gas pipeline flows may be pressured out whether demand at the hub is low or high.

4 The 21 November 2016 gas day

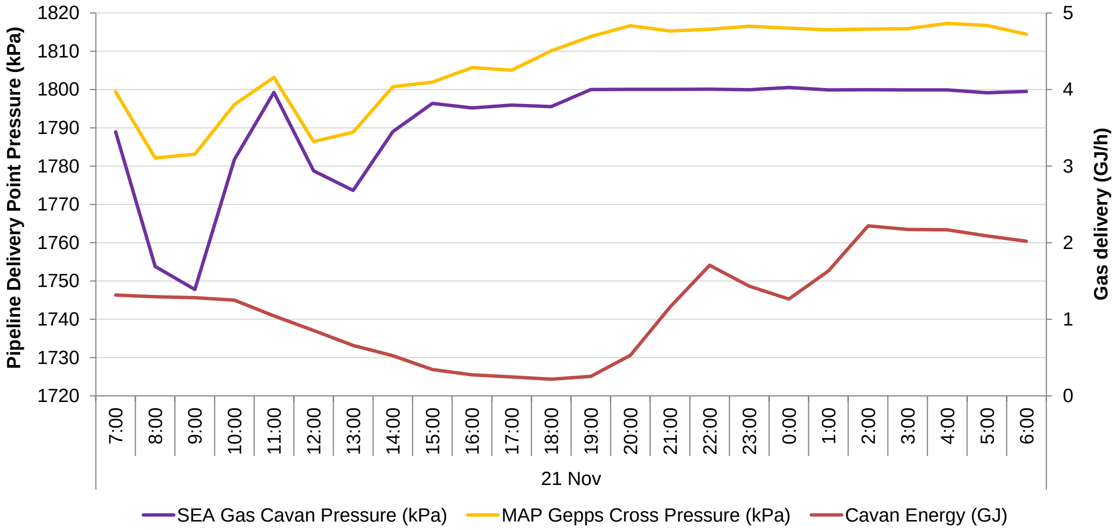
As **Table 1** shows, the record MOS payment on 21 November accrued on a day of below average demand (48 TJ) for the month and below average demand for 2016. High counteracting MOS payments were also recorded the previous day (20 November 2016); a day of even lower demand (43.4 TJ).[7]

4.1 Pressure data

Further to being pressured out toward the extremities of the distribution network, SEA Gas pipeline injections at Cavan are impacted by its proximity to the Gepps Cross delivery point (see **Figure 1**). With the MAP on pressure control, flow volumes at Cavan are influenced by the relative pressures at Gepps Cross. The SEA Gas pipeline typically meets its daily schedule to the hub by relying on its ability to inject (at Cavan) at higher comparative pressures to injections from the MAP at Gepps Cross.

On 21 November, pressures at the Gepps Cross delivery point marginally exceeded 1800 kilopascals (kPa) for much of the day[8]. As shown in **Figure 2**, pressures at Gepps Cross (MAP) were predominantly higher than pressures at Cavan (SEA Gas pipeline) throughout the day.

Figure 2 – Pressure and flows at Cavan (kPa, GJ/hour)



The lower pressures at Cavan (prior to 2 pm) correspond with low demand within the hub during the forward half of the day. During this period the SEA Gas pipeline is on flow control (the drops in pressure reflecting its low scheduled deliveries to the hub during the forward half of the day). Cavan pressures increase and stabilise after 6 pm (at around 1800 kPa) as the SEA Gas pipeline moves to pressure control to meet its schedules during the daily peak (including supply to gas fired generation downstream of the Cavan delivery point).

7 Sunday, 20 November 2016. MOS payment = $107 531. Hub demand = 43.4TJ.

8 Pressures at the Elizabeth and Taperoo delivery points remained below 1800 kPa, averaging 1768 kPa at Elizabeth and 1750 kPa at Taperoo on an hourly basis.

As **Figure 2** shows, after dropping below 1800 kPa before 2 pm, pressures at Gepps Cross remained above 1800 kPa for the remainder of the day, incrementally increasing to 1817 kPa. These circumstances presented the conditions for SEA Gas pipeline injections to be pressured out of the distribution network. These injections could not increase sufficiently to avoid the significant accumulation of balancing gas by the end of the day. The evidence suggests that SEA Gas pipeline injections were pressured out of the distribution network.

It should be stressed that Gepps Cross is an important delivery point for supplies to the Adelaide hub from the MAP. Injection volumes and pressures at Gepps Cross are commonly in excess of those at Elizabeth and Taperoo. Between 1 September and 22 November, the average pressures at Elizabeth and Taperoo were 1765 kPa and 1744 kPa respectively. Gepps Cross pressures averaged 1797 kPa. SEA Gas pipeline injections at Cavan are commonly on pressure control at 1800 kPa and rely on differentials with Gepps Cross pressures to control flows into the hub.

4.2 Daily pipeline schedules

The requirement for significant volumes of balancing gas has most commonly occurred when there is a large differential between the scheduled flows to the hub from the two pipelines (low volumes on the MAP compared to the SEA Gas pipeline). This was again the case on the day of 21 November, with 11.6 TJ scheduled on the MAP and 39 TJ scheduled on the SEA Gas pipeline.[9]

On days where SEA Gas pipeline flows are pressured out of the hub, and there are significantly higher volumes scheduled to the hub on this pipeline compared to the MAP, the higher volumes of pressured out gas are reflected in higher volumes of increase MOS and decrease MOS.

On 21 November, the volumes of increase MOS on the MAP (21 TJ) and decrease MOS on the SEA Gas pipeline (22 TJ) were records for the Adelaide hub. MOS payments on the MAP totalled $159 885. MOS payments on the SEA Gas pipeline totalled $207 449.

4.3 Hourly pipeline schedules

Scheduled increases to injections from the SEA Gas pipeline (to meet hourly demand) often fall short of their target, meaning decrease MOS is generated on the pipeline during a particular period of the day. At other times of the same day, SEA Gas pipeline injections will proceed such that, by the end of the day, their daily schedule is met and there is minimal accrual of counteracting MOS.

On 21 November, the SEA Gas pipeline failed to meet its hourly schedules after 6 pm. Injections at Cavan dropped significantly below schedule throughout the evening,

9 The high MOS payment recorded the previous day (see **Table 1** – 20 November) also coincided with low scheduled deliveries from the MAP (7.3TJ) compared to the SEA Gas pipeline (31TJ).

ultimately falling short of schedule by the end of the gas day and leading to high decrease MOS on the SEA Gas pipeline.

As **Figure 2** shows, this period (6 pm-12 am) of below scheduled injections at Cavan corresponds with pressure increases at Gepps Cross. Between 6 pm and 12 am the pressures at Gepps Cross range between 1810 and 1817 kPa. Pressures at Cavan remain at approximately 1800 kPa throughout the evening (with the injections from the SEA Gas pipeline on pressure control).

The higher pressures at Gepps Cross from 6 pm were among the highest hourly readings at the Gepps Cross Meter Station for the September to November period. The 20 highest hourly pressure readings between 1 September and 22 November were recorded across the three days of 20-22 November[10]. Five of these readings were recorded during the 6 pm-12 am period on 21 November.

Other days of high MOS payments during the same month include 1, 2, 14 and 20 November. Over these days, hourly pressures at Gepps Cross were commonly within the range of 1800-1810 kPa. Pressures at Cavan were often marginally lower, at around 1800 kPa. An exception was 20 November, which saw Cavan pressures dip between 5 pm and 8 pm (to a low of 1748 kPa).

This underlines the argument that SEA Gas pipeline injections at Cavan have been pressured out of the distribution network on high MOS days. Whilst there was little variation between Cavan and Gepps Cross pressures on some other high MOS days during 2016 (e.g. 28 September – see **Table 1**), proximate pressures may contribute to MOS gas accrual on days of significant scheduling differences between the MAP and SEA Gas pipeline. If there is tendency for SEA Gas pipeline injections to be pressured out of the hub, and it corresponds with large scheduled volumes on the pipeline compared to the MAP, then the problem is likely to be exacerbated, with significant volumes of decrease MOS accruing on the SEA Gas pipeline.

4.4 Gas fired generation

In addition to supplying the Adelaide hub, the SEA Gas pipeline provides gas for electricity generators at Adelaide's Torrens Island. The SEA Gas pipeline did provide gas to Torrens Island across the final seven hours of the gas day on 21 November. However, the pipeline injections at Cavan were on pressure control (at around 1800 kPa) throughout this period, meaning there was no observable impact on flows to the hub.

Our analysis other high MOS days at the hub and has not observed any physical link between decrease MOS on the SEA Gas pipeline and gas fired generation. However, shipper renominations to accommodate gas fired generation may add to required volumes of MOS gas on days where contributing factors align. For example, unscheduled gas for Hallett Power Station (north of Adelaide) sometimes requires a shipper to renominate equivalent volumes from the MAP to the SEA Gas pipeline to meet that shipper's nominations into Adelaide. If the scheduled volumes from the SEA Gas pipeline are already significantly larger than those of the MAP, the differential

[10] High counteracting MOS on 20 November led to a MOS payment of $107,530.

will widen. If the conditions for counteracting MOS already exist, the renomination may lead to a larger balancing gas requirement.

4.5 Renominations

Shipper renominations commonly change the profile of deliveries to the hub. On 21 November, the profile of deliveries on the MAP changed significantly (see **Figure 2**). From a D-1 schedule of 11.6 TJ, actual deliveries dropped to a D+1 allocation of 2 TJ. This was due to a 5 TJ renomination from the MAP to the SEA Gas pipeline and to the selling of backhaul.[11]

This meant that the actual differential between hub injections from the two pipelines was larger than forecast. While renominations and backhaul on the MAP are not uncommon, this factor is one of several that combined to create high counteracting MOS on the day. With SEA Gas pipeline injections pressured out, the change to schedules exacerbated the volumes of increase MOS and decrease MOS required.

4.6 Post 21 November

As **Table 1** shows, MOS payments for the Adelaide hub (in 2016) exceeded $100 000 on one occasion after 21 November. This payment ($130 099) was recorded for 26 December but was not associated with further incidence of counteracting MOS.

Notably, daily MOS payments were small during the March quarter of 2017 relative to 2016. By comparison, the short term trend in early 2017 has been toward decreased incidences and volumes of counteracting MOS. No daily MOS payment has exceeded $100 000. The highest daily MOS payment during the March 2017 quarter was $62 183 on 7 March 2017. This payment was associated with counteracting MOS but has been attributed to a metering fault on the day rather than the more enduring factors identified in this report.

11 The renomination is not attributable to supply to the Hallett Power Station on 21 November as it did not generate on the day.

5 Conclusion

From a physical perspective, the cause of counteracting MOS at the Adelaide hub, on 21 November 2016, is layered, combining delivery point pressure differentials; the physical characteristics of the Adelaide distribution network; and hourly schedules. Scheduling plays a key role in increasing the likelihood of counteracting MOS when significantly larger volumes of injections are scheduled from the SEA Gas pipeline compared to the MAP. This presents a circumstance through which other factors can exacerbate the accrual of counteracting MOS.

The MAP has a primary role in maintaining pressures across the Adelaide distribution network. To meet its more intermittent injection schedule, the SEA Gas pipeline relies on its ability to displace MAP gas. If it cannot displace MAP gas and a large comparative volume of gas is scheduled from the SEA Gas pipeline, the scale of the displacement will be compounded.

On 21 November 2016, the large differential between pipeline schedules provided potential for accrual of counteracting MOS. Renominations from the MAP to the SEA Gas pipeline increased this differential, requiring additional flows from the SEA Gas pipeline on the day. The scheduling of increased flows from the SEA Gas pipeline corresponded with high injection pressures at Gepps Cross (MAP), meaning it was likely that SEA Gas pipeline injections at Cavan would be pressured out during the gas day.

While there is no clear indication of a primary cause of counteracting MOS on 21 November 2016, the AER has attributed the record MOS payment to an alignment of factors and will continue to monitor MOS volumes at the Adelaide STTM hub.

Appendix A – MOS and Counteracting

Market Operator Services

For the purposes of the report, this attachment provides a simple explanation of the interaction of the primary commodity gas market and the ancillary Market Operator Services (MOS) market for balancing gas amounts.

For every gas day, AEMO schedules gas to be delivered to the network to meet network forecast demand. In a simple one pipeline example (with no backhaul bids) this means that if the forecast demand of Short Term Trading Market (STTM) Users was 90 terajoules (TJ), AEMO would schedule 90 TJ of the ex ante pipeline offers of STTM Shippers to deliver gas. The market determines an ex ante price (for example $6/GJ) based on the scheduling of gas offers from lowest price to highest price until demand is met. Net sellers receive this ex ante price; net buyers pay this ex ante price.

Alternatively, what may happen is that actual demand in the hub is 95 TJ. This actual demand is used to establish an ex post price which may be higher, for example $7/GJ. This price is relevant to a deviation charge or payment. For example, any participant which under-forecast its demand in the hub (its customers used more gas than forecast) pays this higher ex post price as part of a deviation charge. These charges go towards funding MOS.

MOS, also known as ‘balancing gas’, is the difference between what was scheduled by a pipeline operator (which in most cases matches the nominations submitted by participants) and the actual quantities of gas that flowed on a pipeline on the gas day. Increase MOS and decrease MOS are supplied based on a MOS offer stack which is entirely separate to the STTM’s primary ex ante offer stack.

MOS offers must be based on contracts on pipelines to supply increase MOS (loan gas from the pipeline) or decrease MOS (park gas on the pipeline). In the example above, there will be 5 TJ of increase MOS. This increase MOS is the extra flow of gas which entered the hub to ensure the network received a quantity of gas that meets actual demand (95 TJ) rather than forecast demand (90 TJ).

Counteracting MOS

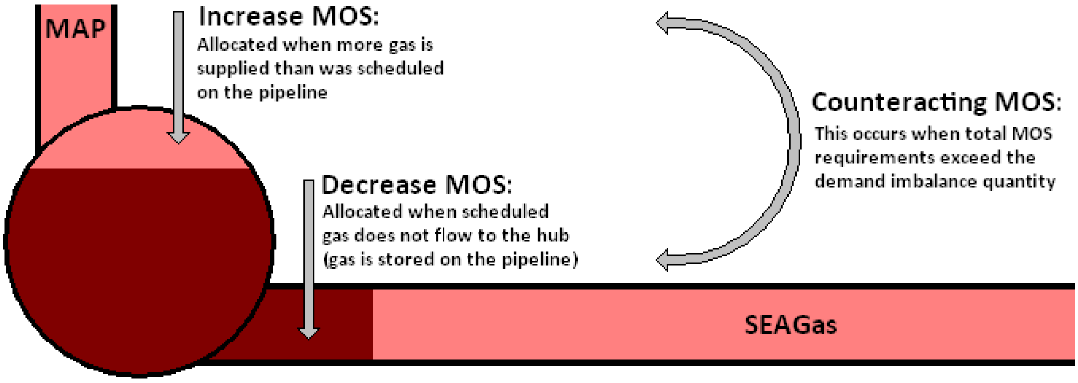
In the Adelaide hub, sometimes increase MOS is provided by the Moomba to Adelaide Pipeline (MAP) at the same time as similar quantities of decrease MOS is provided by the SEA Gas pipeline. This is commonly referred to as 'counteracting MOS'. On days of counteracting MOS there can be little difference between forecast demand in the network and actual demand. Yet, concurrent with this small difference, there can be a significant difference between scheduled receipts and deliveries and actual receipts and deliveries from each pipeline.

This is evidenced in the **Figure 2** table (above) which shows scheduled and actual allocations for the MAP and SEA Gas pipeline on high MOS days in 2016. On

4 September 2016 there is negligible difference between the forecast and actual flows on each pipeline. Yet there is 12 TJ of increase MOS on the MAP and 13 TJ of decrease MOS on the SEA Gas pipeline.

Figure 3 depicts counteracting MOS in the Adelaide STTM. The physical gas imbalance gives rise to payments for increase MOS on the MAP and decrease MOS on the SEA Gas pipeline.

Figure 3 – Counteracting MOS in the Adelaide Hub



Appendix B – AER SPV Reporting Thresholds

Significant Price Variation (SPV) reports for the Short Term Trading Market (STTM) are published by the AER in accordance with the requirements under rule 498(1)(b) of Part 20 of the National Gas Rules.

In accordance with rule 498(2), the AER published an STTM SPV Guideline on 21 December 2012. The guideline sets out a number of thresholds that determine whether or not an SPV has occurred.

The five reporting thresholds set out in the STTM SPV guideline are:

- variations greater than $7/GJ between the D-2 price and ex ante price
- variations greater than $7/GJ between the ex ante and the ex post price
- the ex ante price being greater than three times the 30 day rolling average price and greater than $15/GJ
- the ex post price being greater than three times the 30 day rolling average price and greater than $15/GJ
- MOS service payments exceeds $250,000.

In accordance with rule 354 of Part 19 of the Gas Rules, the AER published a SPV reporting guideline for Victoria's Declared Wholesale Gas Market (DWGM) in June 2010.

The two reporting thresholds set out in the Victorian SPV guideline are when:

- the trade weighted market price published by AEMO on a gas day is more than three times the average price for the previous 30 days and the trade weighted market price is equal to or greater than $15/GJ
- the ancillary payment amount published by AEMO on a gas day is an amount payable or receivable which exceeds $250,000.