

DWGM EVENT – INTERVENTION – 1 OCTOBER 2016

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FINAL

Contents

1	Summary.....	3
2	Appropriateness of actions taken by AEMO.....	3
2.1	Operational response to Longford outage	3
2.2	Ad hoc schedule response to extended Longford outage at 08:30	4
3	Costs of intervention	4
3.1	Ancillary payments generated at the time of the ad hoc schedule	4
3.2	Ancillary payment clawback at the 10:00 schedule.....	5
3.3	Total ancillary payments and uplift for the day.....	6
3.4	Impact on imbalance, deviations and linepack account	6
4	Adequacy of Part 19 of the NGR.....	7
4.1	Requirements for the provision of information from facility operators:.....	7
4.2	Timeline for intervention report:.....	7
	Appendix - Event Chronology	8

1 Summary

At 04:26 AEST on 1 October 2016, there was an unplanned total shutdown of the Esso Longford gas production facility ('Longford plant'), which ceased injections into the Declared Transmission System ('DTS'). Longford injections recommenced at approximately 04:52; however, injections ceased again at 05:36. Longford plant operators subsequently requested AEMO constrain down Longford hourly injections to 0 TJ/h for the first three hours of the gas day. At this stage there was no threat to system security.

At 08:32 Longford plant operators advised AEMO that the Longford plant would be unable to begin injections until around 11:00. AEMO modelling of the DTS indicated that minimum operating pressures near Sale in the Longford to Melbourne Pipeline would be breached around 10:00.

At 08:40, AEMO provided Registered participants with a notice of threat to system security. In accordance with Section 215(4) of the National Gas Rules ('NGR'), AEMO subsequently intervened in the market by publishing an operating schedule at 09:03, outside the standard times specified in Section 215(3) of the NGR, which resulted in ancillary payments and uplift of approximately \$3.1 million.

An event chronology is provided in the appendix.

This report has been prepared under section 351 of the NGR.

2 Appropriateness of actions taken by AEMO

AEMO's primary objectives during this event were to:

- operate in accordance with the NGR and the Wholesale Market Procedures;
- limit the risk of involuntary curtailment to customers; and
- alleviate the threat to system security and return the DTS to normal operating conditions.

2.1 Operational response to Longford outage

AEMO made operational changes in the DTS from 04:45 to preserve linepack in the Longford to Melbourne Pipeline ('LMP'). This included:

1. Shutting down the Wollert Compressor Station
2. Shutting down the Brooklyn Compressors and increasing flow from Brooklyn City Gate into the ringmain.
3. Reducing outlet pressure at Dandenong City Gate ('DCG').

AEMO subsequently held discussions with affected distributors from 06:00 to determine the extent to which pressures near the DCG and near Sale on the LMP could fall below the contractual minimum operating pressures before customer supply would be impacted. The distributor for Sale was concerned about any potential reduction in operating pressure due to the morning peak load as well as the load of a large dairy factory.

AEMO then further reduced the outlet pressure set point at DCG, lowering pressures near DCG below the contractual minimums (revised minimum operating pressures for DCG are often in place during times where the Longford gas plant is at reduced capacity). This reduced the extent to which minimum operating pressures at Sale were subsequently breached.

There was no reported loss of customer supply due to these actions and the risk of loss of customer supply at Sale was mitigated. See Table 1 for a summary of system pressures during this event.

Table 1

Location (CTM)*	Minimum operating pressure	Actual supply pressure reached during event	Time MinOp breached	Time pressure recovered above MinOp
Sale	4,800 kPa	4,759 kPa	10:12 AEST	12:16 AEST
DTS Peninsula	2,650 kPa	2,586 kPa	07:10 AEST	11:48 AEST
DTS Edithvale	2,650 kPa	2,589 kPa	07:15 AEST	11:54 AEST

*Custody Transfer Meter

2.2 Ad hoc schedule response to extended Longford outage at 08:30

At 08:30 the DTS was in an abnormal operating state due to a threat to the supply of gas to customers with both forecast and actual pressures below the operating limits specified in the *Wholesale Market Critical Location Pressures* document. On this basis AEMO determined that there was a threat to system security and, at 08:40, issued a 'Notice of Threat to System Security' to the market.

AEMO determined that an immediate response was required to reduce the likelihood of loss of customer supply at Sale and published a further operating schedule at 09:03 ('ad hoc schedule'). There was insufficient time to wait for either a market response or to schedule out of merit order gas at the following scheduling horizon at 10:00, due to the imminent breach of minimum operating pressures at Sale. LNG was scheduled at the maximum firm rate for the duration of the gas day as modelling showed that it would be required to mitigate low pressures throughout the day.

AEMO considers that the decision to intervene and publish an ad hoc schedule was consistent with the requirements of the Wholesale Market Procedures and the NGR.

3 Costs of intervention

3.1 Ancillary payments generated at the time of the ad hoc schedule

The ad hoc schedule published at 09:03 included the following additional constraints to the 06:00 schedule:

1. A maximum daily constraint was applied to the Longford plant's injections of 180,000 GJ. This was based on a best estimate made by AEMO with information available in the critical time prior to the ad hoc schedule.
2. A constraint preventing net injections was applied with Vichub for the day.
3. A minimum hourly injection rate of 5,500 GJ/hour was applied to the Dandenong LNG facility from 09:00 of the ad hoc schedule for the remainder of the gas day.

The change in daily quantities scheduled across impacted injection points in the DTS is set out in Table 2.

Table 2

Injection Point	6AM schedule quantity (GJ)	Ad hoc schedule quantity (GJ)	Difference (GJ)
Longford (30000001PC)	514,000	180,000	-334,000
LNG facility (30000101PC)	1,751	115,719	113,968
Culcairn (20000001PC)	13,027	86,235	73,208
Iona UGS (30000154PC)	30,898	178,271	147,373
VicHub (30000167PC)	33,000	7,029	-25,971
SEA Gas (30000168PC)	28,001	37,001	9,000

With the exception of any injections bid at the market price for the day and those ineligible for ancillary payments due to being used as an uplift hedge, any additional injections in the ad hoc schedule would have attracted ancillary payments, as they would be priced above the beginning-of-day market price of \$10.8814/GJ. The total ancillary payments at the time of the ad hoc schedule were **\$3,934,329.95**.

3.2 Ancillary payment clawback at the 10:00 schedule

The ad hoc schedule was published after the bid cut-off time for the 10:00 schedule which meant that Market Participants were unable to rebid between the ad hoc schedule and 10:00 schedule. This, in conjunction with a relaxation of the constraints applied to the ad hoc schedule (due primarily to the increased forecast of capacity from Longford), enabled lower priced gas to be sourced elsewhere in the system at the 10:00 schedule, reducing total ancillary payments for the day via the ancillary payment clawback mechanism.

The changes to constraints at the 10:00 schedule were:

1. The maximum daily constraint on Longford's injections of 180,000 GJ was revised up to 220,000 GJ as advised by Longford plant operators.
2. The minimum hourly injection rate (which applied from 09:00 for the duration of the gas day) at the LNG facility was removed and replaced with a minimum hourly injection rate of 8,000 GJ/hour from 10:00 until 14:00, with the remaining hours in the gas day being unconstrained.

The change in daily quantities scheduled across relevant injection points in the DTS for the 10:00 schedule is set out in Table 3.

Table 3

Injection Point	Ad hoc schedule quantity (GJ)	10AM schedule quantity (GJ)	Difference (GJ)
Longford (30000001PC)	180,000	220,000	40,000
LNG facility (30000101PC)	115,719	75,287	-40,432
Culcairn (20000001PC)	86,235	56,011	-30,224
Iona UGS (30000154PC)	178,271	203,271	25,000
VicHub (30000167PC)	7,029	5,129	-1,900
Seagas (30000168PC)	37,001	29,001	-8,000

3.3 Total ancillary payments and uplift for the day

Total ancillary payments across the market for 1 October 2016 were **\$3,103,145.43**. This is provisionally allocated between uplift types in accordance with the *Wholesale Market Uplift Payment Procedures*¹ and set out in Table 4.

Table 4

Uplift Type	Provisional Amount	Percentage of total
Congestion Uplift	\$2,796,749.80	90.1%
Surprise Uplift	\$13,832.52	0.4%
Common Uplift	\$292,563.10	9.4%
Total Uplift	\$3,103,145.42	100%

The majority of uplift payments generated on the day will therefore be attributed to participants who have withdrawals for scheduling intervals that exceed their AMIQ nominations. Section 240(2) of the NGR requires that uplift payments 'are to be allocated so far as practicable to the cause'.

AEMO welcomes feedback from participants as to the sufficiency of the methodology set out in the *Wholesale Market Uplift Payments Procedures* in light of these settlement outcomes.

3.4 Impact on imbalance, deviations and linepack account

Within the timeframe for producing this report, it is not possible to present a quantitative analysis of the impact of the intervention on imbalance payments, deviation payments and linepack account. While these impacts may not strictly be described as being direct costs of the intervention, the following general outcomes in relation to this event should be noted:

¹ <https://www.aemo.com.au/Gas/Declared-Wholesale-Gas-Market-DWGM/Policies-and-procedures>

- The ad hoc schedule replaces the existing 06:00 schedule which had scheduled the Longford plant to begin injections from 09:00.
- Without the ad hoc schedule, participants scheduled to inject from Longford plant would have received a large amount of deviations at the 10:00 price (\$33.75/GJ).
- These deviation payments would have funded a substantial portion of the outstanding linepack account for the day as well as a portion of the total uplift payments (via surprise uplift).

4 Adequacy of Part 19 of the NGR

AEMO has assessed the adequacy of the provisions of Part 19 of the NGR that are relevant to this event. The following issues have arisen from this event, otherwise the NGR are adequate:

4.1 Requirements for the provision of information from facility operators:

In order to assess a threat to system security and determine an appropriate course of action that minimises the cost of responding to the threat, AEMO needs to be informed in a timely manner of any new information that impacts on a facility's ability to inject or withdraw gas into the DTS.

Section 219 of the NGR requires Registered participants to confirm the quantities of gas that they intend to inject into, or withdraw from, the DTS, as well as notify AEMO of any material change to a quantity of gas previously confirmed.

While AEMO was notified of a material change to the quantities intended for injection into the DTS, AEMO had limited additional information to assess the period that the plant was likely to be unavailable and the likely ramp rate to assess the impact on gas supply to customers at Sale.

AEMO believes that this provision should be broadened to allow this additional relevant information to be requested and provided. AEMO will raise this issue for discussion at the next Gas Wholesale Consultative Forum.

4.2 Timeline for intervention report:

Section 351 of the NGR requires AEMO to investigate and prepare a report on the circumstances and impact of a declared threat to system security and subsequent intervention. This report must be prepared within 10 business days after the event concludes.

This timeline is onerous and could impede AEMO from producing a report that provides a complete analysis for events where AEMO has intervened in the market. AEMO will raise this issue for discussion at the next Gas Wholesale Consultative Forum.

Please direct any feedback or questions regarding this report to marketmonitoring.change@aemo.com.au.

Appendix - Event Chronology

Time (AEST)	Event/Action	Details
04:28	AEMO calls Longford	Longford Gas Plant estimates the facility will be down for an extended duration. All four plants are down (3 gas plants and 1 crude plant). AEMO requested that Longford provide further information as soon as possible.
04:45	AEMO reconfigures the DTS	Over a half hour period AEMO commenced reconfiguring the DTS by shutting down all running compression (Brooklyn Comp 11, 12 and Wollert 5) and adjusting Brooklyn CG setpoints.
04:50	AEMO calls Longford	Longford Gas Plant provides an initial forecast that it may take up to 12 hours before they regain full capacity. GP1 is back online and is currently flowing some gas into the DTS but everything else remains offline. AEMO observes some flow through the AEMO gas SCADA.
05:03	AEMO calls Longford	ESSO Gas Marketing advise AEMO of initial estimate of constraint, 4TJ/h for the first 6 hours of the gas day.
05:10	AEMO calls Longford	ESSO Gas Marketing advise that the plant should start coming back online in 2 hours. Estimates the new constraint to be 4 TJ/hr for the first 2 hours of the gas day. ESSO does not believe that this will be a 6 hour event.
05:11	AEMO reconfigures the DTS	DCG outlet pressure reduced from 2760kPa to 2700kPa to increase Longford to Melbourne Pipeline survival time.
05:30	AEMO models the DTS	With current Longford constraint information, AEMO runs a gas pipeline model which is indicating that there is no threat to system security or any potential pressure issues.
05:37	AEMO observation	Longford flow reduces to zero. Note: no further injections observed for another 5 hours
05:47	Longford calls AEMO	ESSO Gas Marketing provide AEMO with an estimate for a daily constraint figure of 514 TJ for the daily rate. This is only a preliminary figure and it will be confirmed shortly. ESSO Gas Marketing are advised by AEMO that they will implement this daily constraint and will constrain down the hourly injections to 0 TJ/h for the first 3 hours of the gas day.
05:53	AEMO approves schedule	6:00 AM Current Gas Day [1 October 2016] Schedule Approved
05:56	Longford emails AEMO	Esso advises an updated SDPC for Gas Day 1 October 2016 of 515 TJ due to operational requirements.
05:57	Longford calls AEMO	ESSO Gas Marketing confirmed the daily quantity of 514TJ and 0 TJ/h for the first 3 hours of the gas day. Inform AEMO that Injections to recommence at 9am.
06:03	AEMO calls Multinet	AEMO discussed the reduction of DCG outlet pressure with Multinet and requested for more information regarding their minimum pressure requirements at their downstream CTMs. AEMO looking to reduce DCG outlet pressure further (2700 kPa at time of call) which would potentially take some CTM's below their winter contractual pressure. Multinet agreed to call back.

Time (AEST)	Event/Action	Details
06:29	AEMO calls AGN	AEMO discussed the reduction of DCG outlet pressure with AGN and requested for more information regarding their minimum pressure requirements at their downstream CTMs. AEMO looking to reduce DCG outlet pressure further (2700 kPa at time of call) which would potentially take some CTM's below their winter contractual pressure. AGN estimates that the DCG outlet pressure may be dropped down to 2500 kPa without disrupting their operations for the DTS Peninsula CTM.
06:34	Multinet calls AEMO	Multinet advises that 1800 kPa is the minimum pressure requirement to satisfy their CTM downstream of Dandenong Terminal Station.
06:40	AEMO calls AGN	AEMO outlined the potential for a breach of the minimum contractual pressures at the Sale CTM. AGN expressed concern about reducing Sale CTM pressure too far below the contractual pressure especially in the morning peak where this pressure is critical. Outside of this time they may be able to go down to 4500kPa without loss of supply to customers.
06:51	AEMO reconfigures the DTS	AEMO reduced DCG outlet pressures to 2600 kPa to further increase Longford to Melbourne Pipeline survival time and prevent Sale CTM pressure breach.
07:00	Longford calls AEMO	ESSO Gas Marketing advise that they will have more accurate information at 08:30 and will be re-evaluating the constraint. Current best estimate is that Longford Gas Plant will not be at full rate in 3 hours. Currently working on restarting Gas Plant 1 and Gas Plant 3 in the next 2 hours.
07:15	AEMO models the DTS	With current Longford constraint information, AEMO runs a gas pipeline model which shows potential for Sale CTM pressure issues at 2PM
07:30	AEMO reconfigures the DTS	Adjusted the DTS configuration to bring linepack from the Northern Zone into the Melbourne metropolitan ring main and the Wollert to Pakenham line.
07:38	Longford calls AEMO	ESSO Gas Marketing advised that they are close to providing a revised constraint. AEMO emphasised that the constraint they provide should be conservative.
08:14	AEMO calls Jemena	AEMO discussed VicHub-DTS injections with Jemena given that they are dependent on EGP linepack.
08:27	AEMO models the DTS	With current Longford constraint information and still no flow from Longford, AEMO runs a gas pipeline model which is indicating that Sale CTM will breach contractual pressures between 10:00 and 10:30. AEMO commences preparation for an ad-hoc schedule.
08:29	AEMO calls Longford	ESSO Gas Marketing will provide an update in 15-20 minutes. AEMO advised ESSO that it is preparing to declare a threat to system security and run an ad-hoc schedule. ESSO Gas Marketing requested 5 more minutes to determine quantities. AEMO stated to ESSO that it will use a conservative estimate of their capacity if they are unable to provide a firm quantity.
08:32	Longford calls AEMO	ESSO Gas Marketing estimates that the total Longford plant capacity for the day will be 540 TJ and will start ramping up at 11:00. ESSO Gas Marketing highlighted that this was plant capacity and that injections still needed to be split between the DTS and EGP as per shipper instructions.

Time (AEST)	Event/Action	Details
08:40	AEMO notifies market	AEMO declares a Threat to System Security.
09:03	AEMO approves schedule	9:00 AM Ad-Hoc schedule published Current Gas Day [1 October 2016] Schedule Approved
09:15	AEMO notifies market	A Victorian Gas Update teleconference was held utilising the Victorian Energy Emergency Communications Protocol (VEECP).
09:26	Longford emails AEMO	Esso advises an updated SDPC for Gas Day 1 October 2016 of 220,000 GJ due to operational requirements.
09:54	AEMO approves schedule	10:00 AM Current Gas Day [1 October 2016] Schedule Approved
10:45	AEMO observation	Longford commences flow at approximately 2TJ/hr into the DTS ramping up to 4TJ/hr by 11:15
11:30	AEMO notifies market	A Victorian Gas Update teleconference was held utilising the Victorian Energy Emergency Communications Protocol (VEECP).
14:30	AEMO notifies market	A Victorian Gas Update teleconference was held utilising the Victorian Energy Emergency Communications Protocol (VEECP).