

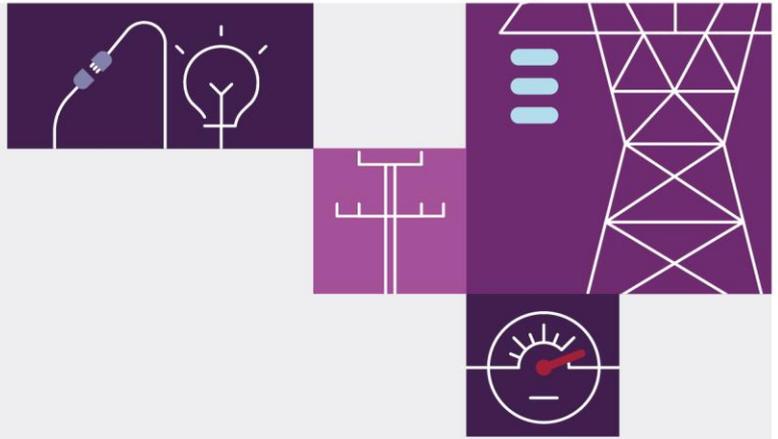
Declared Wholesale Gas Market – Dandenong LNG Event Report

March 2023

Notice of threat to system security

A report into low LNG stock levels at the Dandenong
LNG storage facility





Important notice

Purpose

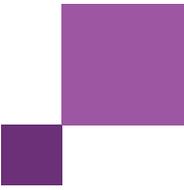
AEMO has prepared this report pursuant to rule 351 of the National Gas Rules, using information available as of March 2023, unless otherwise specified.

Disclaimer

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1 Introduction

In the 2022 Victorian Gas Planning Report Update (VGPR)¹ AEMO identified a threat to system security for the Victorian Declared Transmission System (DTS) from winter 2022 onwards due to insufficient Dandenong LNG contracted capacity. AEMO had previously identified a threat to system security in the 2021 VGPR due to this issue. AEMO notified the market on 8 March 2022 that this threat had ended and published a market intervention report².

AEMO's modelling and information gathering for the 2022 VGPR identified insufficient contracted Dandenong LNG inventory available (including AEMO contracted quantities) in the event of certain operational and emergency scenarios from winter 2022. This meant there was an increased risk of curtailment of gas customer demand for winter 2022 onwards unless the LNG inventory was increased to the levels determined in the 2022 VGPR modelling. On 29 March 2022, AEMO notified the market of a threat to system security with an expectation that the threat would commence on 1 May 2022. In this notice AEMO indicated that a market response may alleviate the threat to system security and remove the need for AEMO to act.

The estimated contracted Dandenong LNG capacity required to respond to credible threat to system security events during winter 2022 had increased since winter 2021 to 128 TJ from 110 TJ. The requirement for 140 TJ to be reserved to facilitate a system shutdown during an emergency remained the same.

The contracted quantity of 250 TJ at the time was less than the 268 TJ required to cover the operational and emergency scenarios. As outlined in the 2022 VGPR Update, the LNG inventory requirement was expected to increase in 2023 but remain relatively low.

On this basis AEMO advised that the threat would be ongoing and also impact winter 2023 due to the expected contracted capacity at Dandenong remaining relatively low. As highlighted in the March 2022 intervention report, AEMO contracted 60 TJ of capacity with APA on 19 January 2022. Subsequently, an additional 80 TJ capacity was contracted with APA on 30 June 2022.

On 15 December 2022 the AEMC published a final set of rules which required AEMO to contract any uncontracted Dandenong LNG tank capacity and to fill that capacity prior to winter 2023 to reduce the likelihood of curtailment in Victoria. Subsequently AEMO notified the market on 16 March 2023 that the threat had ended.

Prior to the rule change, the cost of AEMO's 140 TJ LNG Reserve was recovered through AEMO's fees on the same basis as the existing Declared Wholesale Gas Market (DWGM) fees. The rule change requires AEMO to recover its Dandenong LNG costs less any revenue via a new fee that is determined monthly. Details are provided in the new Wholesale Market LNG Procedures, which is effective from 1 March 2023.

Rule 351 of the National Gas Rules (NGR) requires that AEMO investigate and prepare a report following an event which is or may be a threat to system security. Rule 351 also requires that AEMO assess and advise on:

- the adequacy of the provisions of the NGR relevant to the event or events,
- the appropriateness of actions taken by AEMO in relation to the event or events, and

¹ AEMO, 2022 Victorian Gas Planning Report, at https://www.aemo.com.au/-/media/files/gas/national_planning_and_forecasting/vgpr/2022/2022-victorian-gas-planning-report-update.pdf

² AEMO, March 2022, Market Intervention Report, at <https://www.aemo.com.au/-/media/files/gas/dwgm/2022/dwgm-er-21-004-winter-2021.pdf>

- the costs incurred by AEMO and Registered participants as a consequence of responding to the event or events.

This report is published in accordance with rule 351(2) of the NGR.

2 Background

AEMO's declared system functions include controlling the operation and security of the DTS³, and AEMO has a duty to minimise, as far as practicable, the hazards and risks to safety of the public and customers arising from a gas supply interruption⁴. One of the greatest risks to the safety and security of the DTS is an extended gas supply interruption during a period of high demand.

Dandenong LNG is a critical piece of infrastructure in the DTS due to its proximity to Melbourne with its ability to quickly ramp up and inject gas into the DTS to restore pipeline pressures. It is not uncommon for AEMO to schedule gas to be injected into the DTS from the Dandenong LNG facility because of a threat to system security, although this typically only occurs on high-demand days.

2.1 Historical LNG usage

Historically Market Participants have maintained Dandenong LNG storage levels at or close to the maximum capacity (680 TJ) as winter approaches.

Table 1 summarises threat to system security (TTSS) events where LNG was required, the total amount of LNG injected across those events, the total market use of LNG, and the maximum storage level depletion during each winter since 2017. In addition to this winter LNG use, the Longford Gas Plant experienced a six hour unplanned full plant outage on 1 October 2016 that resulted in 116 TJ of LNG injections being initially scheduled (which was reduced to 74 TJ when Longford returned to service).⁵

Table 1 Summary of number LNG usage in recent winters

Year	TTSS Events	LNG (TJ) used in TTSS	Market LNG (TJ)	Total LNG Scheduled (TJ)	Minimum tank level (TJ)	Cumulative EDD ⁶
2017	1	17.9	14.5	32.4	596	878
2018	0	0	58.3	58.3	610	879
2019	3 ⁷	44	76.3	120.3	600	845
2020	4 ⁸	135	246 ⁹	381	526	884

³ South Australian Government. National Gas Law, 91BA(1)(b). Available at [https://www.legislation.sa.gov.au/lz/c/a/national%20gas%20\(south%20australia\)%20act%202008/current/2008.19.auth.pdf](https://www.legislation.sa.gov.au/lz/c/a/national%20gas%20(south%20australia)%20act%202008/current/2008.19.auth.pdf). Viewed: 14 October 2021.

⁴ Victorian Government. Gas Safety Act 1997, Section 32(c). Available at <https://content.legislation.vic.gov.au/sites/default/files/2020-12/97-99aa045%20authorised.pdf>. Viewed: 14 October 2021.

⁵ Intervention Report for 1 October 2016 Longford unplanned full plant outage: <https://www.aemo.com.au/-/media/files/gas/dwgm/2016/dwgm-ir-16-002-14th-october-2016.pdf>

⁶ EDD (effective degree days) is a measure of coldness. The higher the EDD, the more gas is expected to be used for heating.

⁷ There were two interventions at the end of May 2019 accounting for 32 TJ being injected in responding to threats to system security.

⁸ Winter 2020 was impacted by the changing demand profile due to people working from home due to COVID-19. This has been documented in the 2020 Intervention Reports available here <https://aemo.com.au/energy-systems/gas/declared-wholesale-gas-market-dwgm/dwgm-events-and-reports>

⁹ It is likely that the higher volume of market LNG relates to a contract terminating and Market Participant(s) selling the gas into the market. 165 TJ was scheduled to be injected in September 2020.

Year	TTSS Events	LNG (TJ) used in TTSS	Market LNG (TJ)	Total LNG Scheduled (TJ)	Minimum tank level (TJ)	Cumulative EDD ⁶
2021	3	0	7.1	7.1	299	821
2022	4	3.9	71.4	75.3	256	883

2.2 Intervention

Modelling for the 2021 VGPR identified that low Dandenong LNG inventory was a threat to system security which was subsequently notified to the market. While that threat was closed out on 8 March 2022, updated modelling for the 2022 VGPR Update indicated that a higher inventory volume was required.

The VGPR set out two scenarios where AEMO would be required to intervene in the market or direct gas to be injected from Dandenong LNG:

- Threat scenario – for use when LNG is required to be injected as out-of-merit-order gas as an operational response to a threat to system security to prevent system pressures dropping below their minimum allowable operating levels. This type of event typically occurs on a high-demand day, and it can occur several times a year.
- Emergency scenario – for use in an emergency curtailment situation to support the stabilisation of critical system pressures as curtailment of residential, small commercial and large industrial load occurs. This is a very low probability event with potentially very high public safety consequences. It is likely that a threat scenario would precede an emergency scenario.

The modelling undertaken by AEMO for the 2022 VGPR indicated that approximately 140 TJ of LNG was still required as reserve in the Dandenong LNG facility for the emergency scenario. This meant that AEMO required 140 TJ in the facility to manage an emergency curtailment event safely and therefore AEMO would only allow the usable storage levels at Dandenong to drop below 140 TJ during an emergency. AEMO also determined that an additional 128 TJ was required for the threat scenario (increased from 110 TJ in the 2021 VGPR), or 268 TJ in total.

Historically there has been sufficient LNG stock in the facility for both the threat scenario and emergency scenario, including market-scheduled LNG. However, at the lower contracted levels, there are times when there would have been insufficient volumes to meet these scenarios.

2.3 LNG contracted volumes and call for a market response

Information obtained when preparing the 2022 VGPR, and as shown on the Gas Bulletin Board, indicated that Dandenong LNG would have an additional 80 TJ of market¹⁰ contracted capacity leading into winter 2022 hence making it 140 TJ, from a capacity of 680 TJ. The low level of contracted capacity, combined with the requirements to meet the emergency and threat scenarios resulted in AEMO issuing a Notice of a Threat to System Security on 29 March 2022 calling for a market response, with an expectation that the threat would commence from 1 May 2022. In this notice AEMO indicated that a market response may alleviate the threat to system security if Market Participants were to contract LNG capacity at Dandenong.

¹⁰ APA does hold additional volumes for its own commercial and operational purposes.

2.4 LNG reserve

Prior to 2010, AEMO (and previously VENCORP) held 3,000 tonnes (~165 TJ), approximately a quarter of the capacity of the Dandenong LNG facility, as an LNG reserve. This reserve was to ensure that there would be sufficient LNG stock maintained in the facility to maintain minimum system pressures in the event of a gas emergency (Emergency scenario). In 2010, following an amendment to the National Gas Rules, the National Gas Amendment Dandenong Liquefied Natural Gas Storage Facility¹¹ (the 2010 Rule Determination), AEMO ceased to hold its own LNG reserve.

The intent of the 2010 Rule Determination was to improve and promote efficient capital investment of the Dandenong LNG facility, as well as giving APA greater flexibility over its operation in being able to offer more services. There were some elements of the original mechanisms that were retained, including:

- the potential for AEMO to re-establish an LNG reserve; and
- the intervention powers of AEMO under NGR 343 allowing AEMO to inject from an LNG reserve.

The intent of the 2010 Rule Determination assumed that alternative sources of supply would mean stronger system security. Since then, AEMO has become aware that these original intentions do not hold in the current climate. Changes to the market, such as alternative supply sources, provide Market Participants with more options in managing their gas portfolios, potentially reducing the need to contract at Dandenong LNG.

However, LNG storage is still critical for system security and plays an essential role should an emergency scenario or threat scenario occur. If the Dandenong LNG facility was not available, without increased levels of supply and investment in the DTS, there would be a higher likelihood of curtailment during an unplanned outage or during periods of unforecast high demand (usually due to colder than forecast weather).

2.5 DWGM interim LNG storage measures rule

From 15 December 2022 the AEMC made a rule to enable AEMO to better manage the risk of curtailment for gas users¹². This rule change requires AEMO to act as both buyer and supplier of last resort for the Dandenong LNG facility, requiring AEMO to buy all the uncontracted capacity of the facility and purchase gas from the DWGM to fill the tank capacity. FAs a result of agreement between AEMO and APA for the uncontracted Dandenong LNG capacity including a filling schedule, and the publication of the 2023 VGPR, AEMO has ended the threat to system security from winter 2023 onwards on the expectation that the LNG storage inventory will be full prior to the end of May 2023.

¹¹ AEMC, 2010. "Dandenong Liquefied Natural Gas Storage Facility". Available at <https://www.aemc.gov.au/rule-changes/dandenong-liquefied-natural-gas-storage-facility>. Viewed: 4 October 2021

¹² DWGM interim LNG storage measures <https://www.aemc.gov.au/rule-changes/dwgm-interim-lng-storage-measures>

3 Assessment of event

This threat event was a direct result of the low levels of contracting at Dandenong LNG. AEMO issued a threat to system security due to this low LNG stock and called for a market response in accordance with NGR 342.

3.1 Adequacy of Part 19 of the NGR

Part 19 of the NGR has fundamentally changed since the threat to system security was originally issued. A rule change became effective on 15 December 2022 requiring AEMO to contract uncontracted Dandenong LNG capacity in time to fill the storage prior to winter 2023. Many concerns AEMO had around transparency, contracting LNG and cost recovery have been addressed in that rule change, and the subsequent publication of LNG Reserve Procedures on 1 March 2023.

In respect to this event, AEMO assessed the application and adequacy of the NGR, with a primary focus on the following:

- LNG reserve
- Threats to system security
- Intervention reports

3.1.1 LNG reserve

Prior to 15 December 2022, NGR 200 defined the LNG reserve as the LNG storage capacity to which AEMO is entitled under its LNG storage agreement and NGL 91BA(2) provides for AEMO to trade in natural gas. One of the options available to AEMO, as per NGR 343(1), when intervening in the market is to inject gas from AEMO's LNG reserve. This was maintained during the 2010 Rule Determination to allow AEMO, if required, to enter into contracts to re-establish an LNG reserve.

On the basis that the threat would be ongoing and impact into winter 2022 and beyond, due to the expected contracted capacity at Dandenong remaining relatively low, AEMO re-established an LNG reserve by agreeing a contract with APA in January 2022.

The 15 December 2022 rule change addressed many of the concerns AEMO had around contracting LNG reserves and given they have only been in place for a short time, it is difficult to suggest further NGR improvements at this time.

3.1.2 Threat to system security

NGR 341 requires that if AEMO believes there is a potential threat to system security, it must notify Registered participants, without delay, of the details of that threat to system security. The information to be provided in this notice includes:

- The nature and magnitude of the threat to system security, which includes estimates of the duration of the threat to system security and the shortfall in gas supplies
- Whether AEMO will intervene in the market to avert the threat and, if so, the time intervention will be required if there was an insufficient market response.

AEMO notified the market of the threat to system security on 29 March 2022, indicating the threat would commence from 1 May 2022 and an end date to the threat was not possible to estimate at time of notice publication. AEMO also reserved the right to determine an appropriate operational response if there was an insufficient market response.

AEMO acknowledges that the 15 December 2022 rule change has provided greater clarity on AEMO's contracting of LNG reserve capacity and the new obligations placed on AEMO by the new Rules were the reason for ending the threat to system security.

3.1.3 Intervention report timing

NGR 351 places an obligation on AEMO to publish a report within 10 business days after a threat to system security event. AEMO has adopted the following approach to reporting on these events, wherever possible:

- Investigate and publish a report based on immediately available data within 10 business days of the relevant event.
- Where not all information necessary to complete the required assessment is available, that report will be flagged as preliminary, with a final report to be published once the additional information is received and analysed.

For the purposes of this report, AEMO believes it has all necessary information and does not intend to publish a subsequent report.

3.2 Appropriateness of AEMO's actions

AEMO's 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 including any gas generation
- Alleviate the threat to system security.

Following the issuing of the Notice of a Threat to System Security, some higher levels of Market Participant contracting of LNG capacity did also occur.

While NGR 341(1) does contemplate AEMO issuing a Notice of a Threat to System security when publishing the VGPR (or an update), the following sections of NGR 341 are mainly concerned with immediate operational threats to system security. AEMO can see the benefit in the rules and the Wholesale Market Procedures providing greater clarity for managing threats that are identified in the VGPR.

AEMO contracted 60 TJ of LNG reserve capacity on 19 January 2022 given the continued low levels of contracting at Dandenong LNG. AEMO added 80 TJ to its contracted capacity to fully meet the emergency reserve capacity requirement based on feedback from Market Participants. The rule change of 15 December 2022 has since provided greater clarity on AEMO's responsibilities for 2023 and beyond.

AEMO believes its actions were appropriate to meet these objectives.

3.3 Costs of intervention

On the basis that the Market Participant contracted capacity remained low, AEMO entered into a contract for LNG capacity. The cost of contracting this LNG reserve was made of up of direct costs payable to APA for the capacity and refilling, and the commodity cost of purchased gas. These costs were recovered through AEMO's fees, using the existing DWGM fee structure. From 1 March 2023 AEMO's LNG costs will be recovered through a new fee as outlined in the new Wholesale Market LNG Reserve Procedures (Victoria).

4 Conclusion

AEMO has assessed the application and adequacy of associated NGR provisions based on the market rules at the time of contracting LNG capacity, acknowledging that the 15 December 2022 rule change fundamentally changed AEMO's roles and responsibilities for contracting LNG going forward. Given these new rules have only been in place for a short time and not yet tested in winter, it is difficult for AEMO to provide further suggestions to improvements of the NGR at this time.

Please direct any feedback or questions regarding this report to GasMarket.Monitoring@aemo.com.au.

A1. Chronology

Date/Time (AEST)	Event/Action	Details
19 January 2022	AEMO contracted APA	AEMO contracted 60 TJ LNG reserve with APA.
29 March 2022	AEMO	Publication of 2022 VGPR showing insufficient contracted Dandenong LNG stock was forecast for operational and emergency scenarios during winter 2022 onwards.
29 March 2022	Market notice	AEMO notified the market indicating threat to system security to commence from 1 May 2022. This market notice also called for a market response to alleviate the threat to system security.
30 June 2022	AEMO contracted APA	AEMO contracted an additional 80 TJ LNG reserve (the entire 140 TJ emergency scenario requirement) with APA based on feedback from Market Participants.
15 December 2022	AEMC Rule change effective	New rules effective requiring AEMO to contract uncontracted DLNG capacity to reduce the risk of curtailment of gas users
16 March 2023	Market notice	AEMO notified the market that the threat to system security for winter 2022 onwards had ended.