Wholesale Market System Security Procedures (Victoria)

Prepared by:	AEMO Gas Operations
Version:	2.0
Effective date:	1 May 2024 (TBC)
Status:	FINAL

Approved for distribution and use by:

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Date:	15 / 12 / 2023

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Current version release details

Version	Effective date	Summary of changes
2.0	1 May 2024	AEMO is making amendments to these *system security procedures* to account for the AEMC's "DWGM distribution connected facilities" and "Review into extending the regulatory frameworks to hydrogen and renewable gases" rule changes.

Note: There is a full version history at the end of this document.

1. Introduction

1.1. Purpose

These are the Wholesale Market System Security Procedures (Victoria) (Procedures) made in accordance with section 91BL of the National Gas Law (NGL) and ~~R~~rule 205 of the National Gas Rules (NGR).

The NGL and the NGR prevail over these Procedures to the extent of any inconsistency.

These Procedures may only be amended in accordance with Part 15B of the NGR.

1.2. Application

These Procedures apply to AEMO and each person to whom they are expressed to apply.

1.3. Legal and regulatory framework

These Procedures have been made under section 91BL of the National Gas Law and rule 205(1) of the NGR.

The *system security procedures* provide for the operation of the *declared transmission system* (DTS) in a way that averts or minimises threats to system security, as required by rule 205.

1.4. Definitions and interpretation

1.4.1. Glossary

Terms defined in the NGL and the NGR have the same meanings in these Procedures unless otherwise specified in this clause.

Terms defined in the NGL and NGR are intended to be identified in these Procedures by italicising them, but failure to italicise a defined term does not affect its meaning.

The words, phrases and abbreviations in the table below have the meanings set out opposite them when used in these Procedures.

Table 1 Defined terms

Term	Definition
Autumn	The calendar months of March and April inclusive.
BoD	Beginning of Day *(gas day)*
CG	City Gate
CS	Compressor Station
CTM or Custody Transfer Meter	Custody Transfer Meters (CTMs) as defined in the Wholesale Market Metering Procedures. ~~are the physical meters that allow for the transfer, delivery or receipt of gas within the Market and are listed in the DWGM Custody Transfer Meter report.~~
DDS	*declared distribution system* as defined in Part 19 of the Rules. [Note only declared distribution systems that are directly connected to the DTS are covered by Part 19]
DTS	*Declared Transmission System*

Term	Definition
DWGM	*Declared Wholesale Gas Market*
EGP	Eastern Gas Pipeline
gas emergency protocol	The requirements of the *gas emergency protocol,* as defined in the National Gas (Victoria) Act section 53, is comprised of the following documents: (a) Emergency Procedures (Gas); (b) Gas Load Curtailment and Gas Rationing and Recovery Guidelines; and (c) Gas Curtailment List (published on the MIBB). The *gas emergency protocol* can be found on the AEMO website at: https://aemo.com.au/energy-systems/gas/emergency-management/victorian-role
GPG	gas-fired power generation
Linepack	The amount of energy in the *gas* stored in the declared transmission system.
linepack zone	A section of gas transmission pipeline which is defined by compressors, valves, regulators, *market injection points* and/or *market withdrawal points* in which linepack is located.
LMP	Longford to Melbourne Pipeline
LNG	Liquified natural gas
NEM	National Electricity Market.
NGL or Law	National Gas Law.
NGR or Rules	National Gas Rules.
Out of merit order gas	~~Gas injections that are scheduled above market price, or gas withdrawals that are scheduled below market price~~*Bids* scheduled by AEMO in the *operating schedule* at a bid price that is greater than the *market price*. *Injection bids* scheduled in this manner will be funded for by *ancillary payments*.
PRS	Pressure Reduction Station.
SCADA	Supervisory Control and Data Acquisition
~~Schedule~~	~~An operating schedule~~
Shoulder	The calendar months ~~of~~ defined as Spring and Autumn~~October and November and the months of March and April inclusive~~.
Spring	The calendar months of October and November inclusive
Summer	The calendar months of December to February inclusive.
SWP	South West Pipeline
TGP	Tasmanian Gas Pipeline
withdrawal zone or WZ	A withdrawal zone that contains the CTMs in each region as defined in table 4 of this Procedure.
t/h	Tonnes per hour (of LNG).
VGPR	Victorian Gas Planning Report
VNI	Victorian Northern Interconnect
Winter	The calendar months of May to September inclusive.
WORM	Western Outer Ring Main
WTS	Western Transmission System

1.4.2. Interpretation

The following principles of interpretation apply to these Procedures unless otherwise expressly indicated:

(a) These Procedures are subject to the principles of interpretation set out in Schedule 2 of the National Gas Law.

(b) References to time are references to Australian Eastern Standard Time.

(c) Market prices are determined to four decimal places and *gas* is *scheduled* in integer gigajoule terms to the whole gigajoule.

1.5. Related documents

The following documents support this Procedure.

Table 2 Related wholesale market procedures

Reference	Title	Location
Capacity Transfer and Auction Procedures	Capacity Transfer and Auction Procedures	https://www.aemo.com.au/energy-systems/gas/pipeline-capacity-trading-pct/procedures-policies-and-guides
Gas Emergency Protocol	Gas Emergency Protocol	https://www.aemo.com.au/energy-systems/gas/emergency-management/victorian-role
Connection Approval Procedures	Wholesale Market Connection Approval Procedures (Victoria)	https://www.aemo.com.au/energy-systems/gas/declared-wholesale-gas-market-dwgm/procedures-policies-and-guides
Gas Quality Procedures	Wholesale Market Gas Quality Monitoring Procedures (Victoria)	
Maintenance Planning Procedure	Wholesale Market Maintenance Planning Procedures (Victoria)	
Management Procedures	Wholesale Market Management Procedures (Victoria)	
Market Operations Procedures	Wholesale Market Operations Procedures (Victoria)	
Metering Procedures	Wholesale Market Metering Procedures (Victoria)	
Settlement Procedures	Wholesale Market Settlement Procedures (Victoria)	
System Security Procedures	Wholesale Market System Security Procedures (Victoria)	

1.6. Technical documents

The following technical documents support this Procedure.

Table 3 Related technical documents

Reference	Title	Location
Critical Locations Pressure	Wholesale Market Critical Locations Pressure	https://www.aemo.com.au/energy-systems/gas/pipeline-capacity-trading-pct/procedures-policies-and-guides

2. Normal operating state

AEMO aims to operate the DTS in a normal operating state, which is achieved when all of the following conditions are met:

(a) the DTS is operating in accordance with the *gas quality monitoring ~~Guidelines~~ procedures* and breaches of the *gas quality specifications* ~~as outlined in the Gas Quality Guidelines~~ do not require intervention by AEMO;

(b) in AEMO's reasonable opinion, there is no *gas* related threat to public safety~~.~~;

(c) in AEMO's reasonable opinion, there is no threat to the supply of *gas* to *customers*; and

(d) system pressures and *flow rates* are within, and forecast to remain within (given the observed and anticipated rates of change), the operating limits specified in the Wholesale Market Critical Location Pressures. ~~.~~Each of the following is an example of when this condition is met:

(i) sufficient assets within the DTS are available to provide the capacity to meet forecast *gas* supply and demand conditions;

(ii) sufficient information is available to assess the status of the DTS; and

(iii) the effects of unplanned events that affect the DTS can be controlled by operational responses, such as changing the operation of compressors, or changing regulator set pressures.

2.1. Declared transmission system overview

The DTS consists of a number of major pipelines and laterals supplying the Melbourne metropolitan and Victorian regional WZ~~zone~~s. ~~.~~Each of the major pipelines is characterised by its own dynamics in demand, flows, linepack and pressures as shown in Figure 1, ~~and~~ Figure 2 and Table 4. ~~.~~AEMO will exercise operational control of the DTS in a way that ensures a secure state for each major pipeline that should result in security of the DTS as a whole.

AEMO may publish periodic updates to the DTS map in the Victorian Gas Planning Report (VGPR).

Figure 1 Physical representation of the DTS

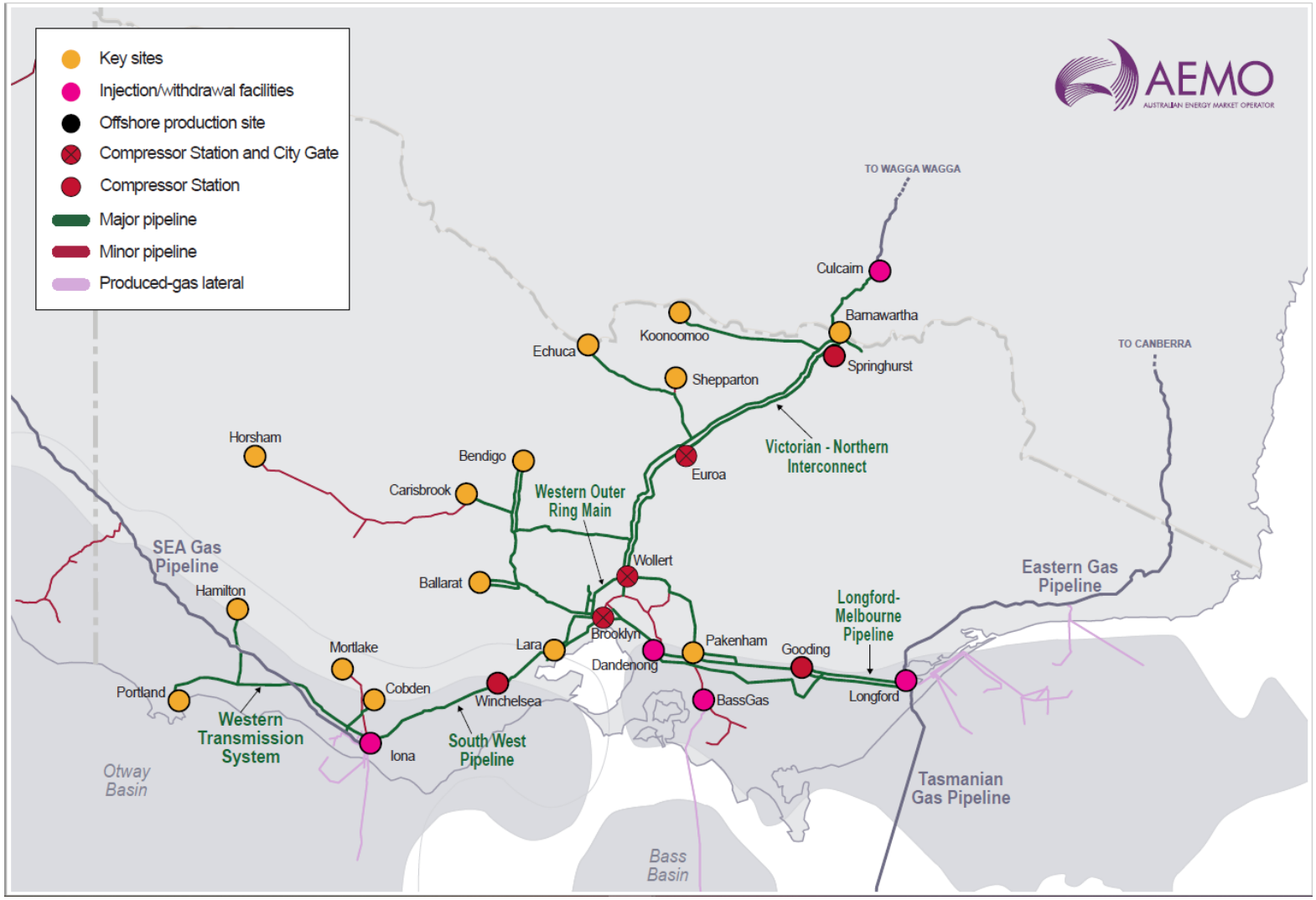


Figure 2 Topological representation of the DTS

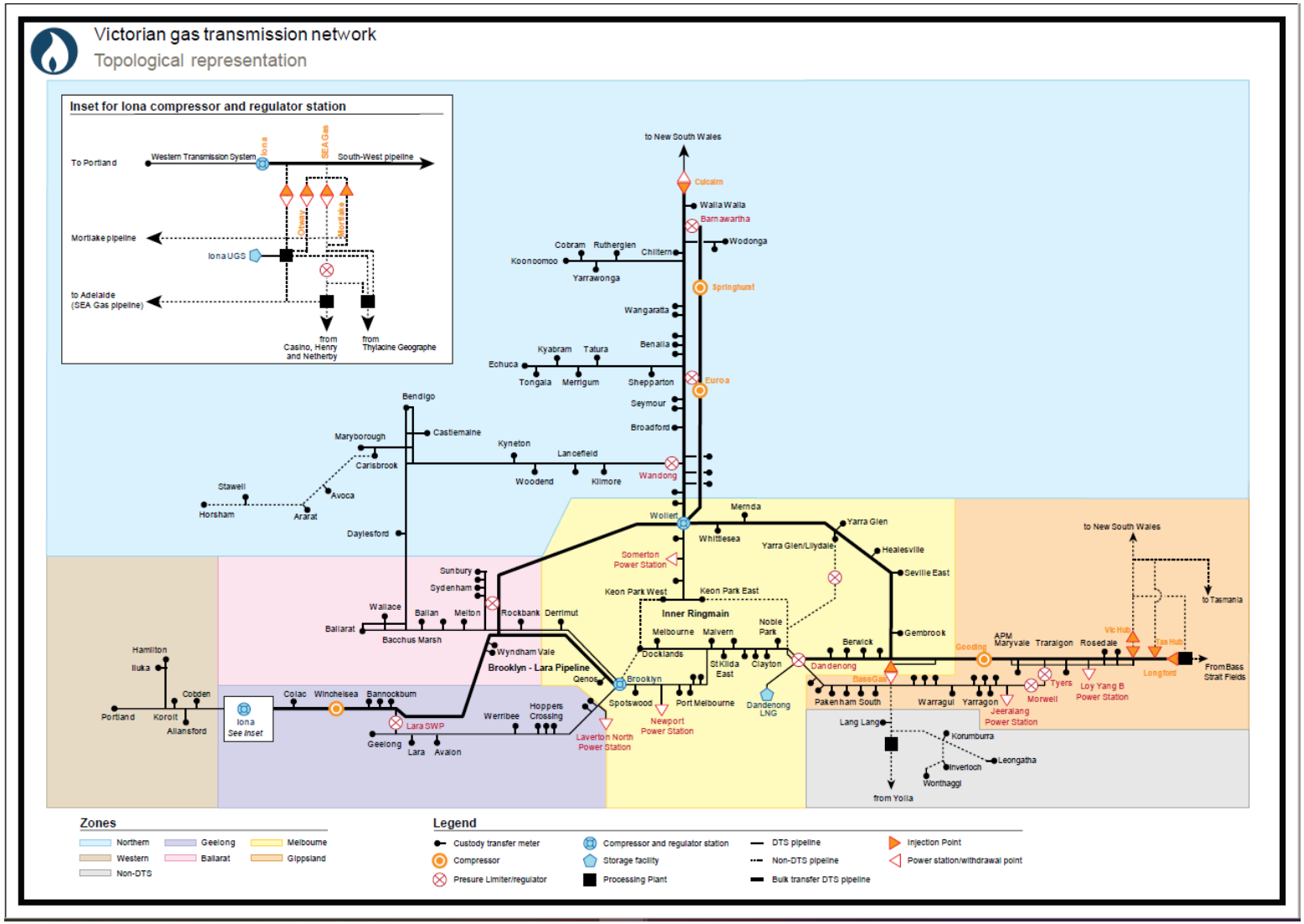
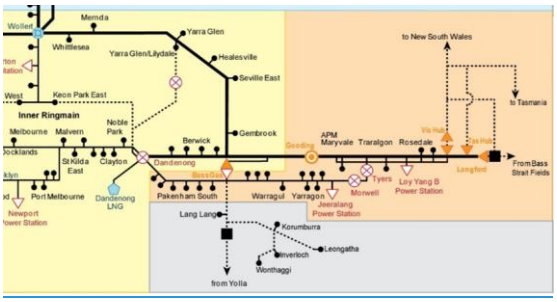
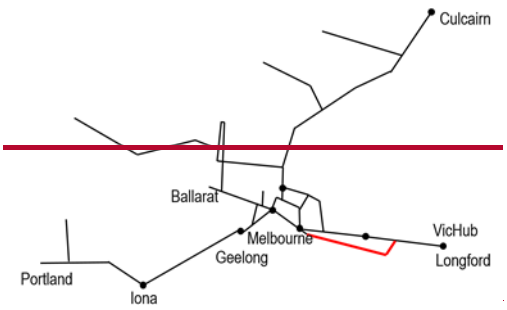
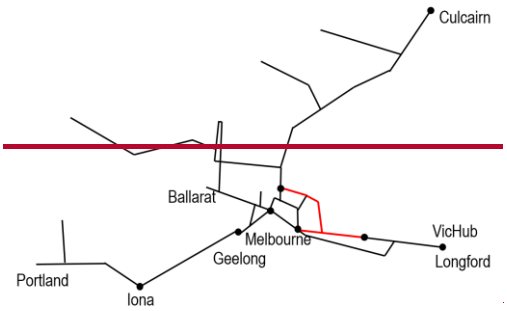
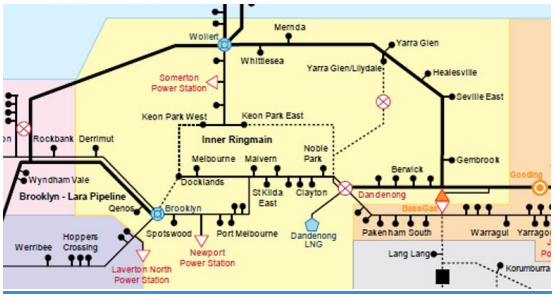
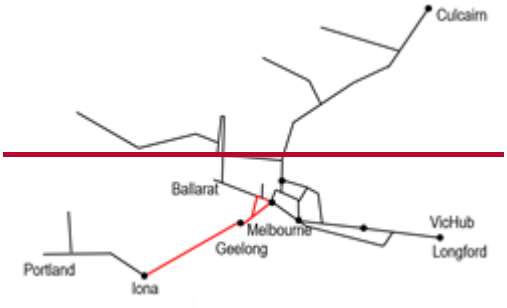
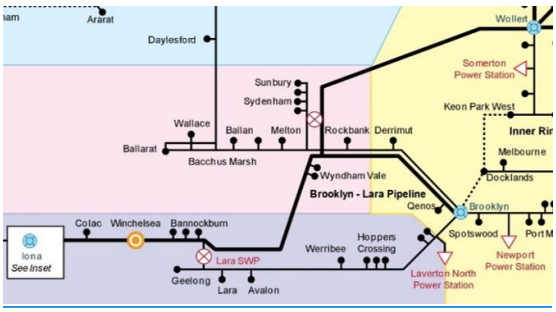
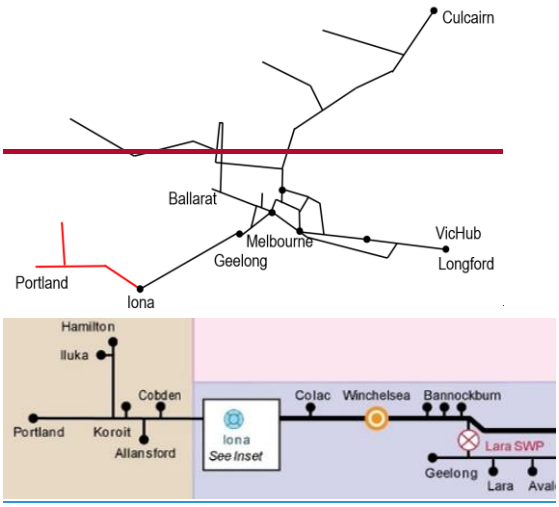
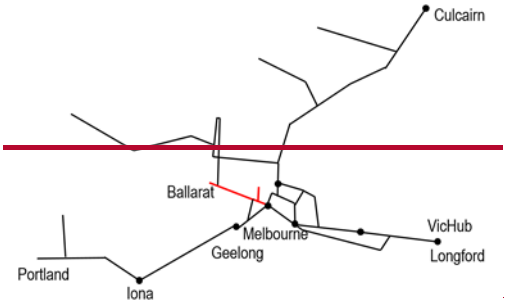


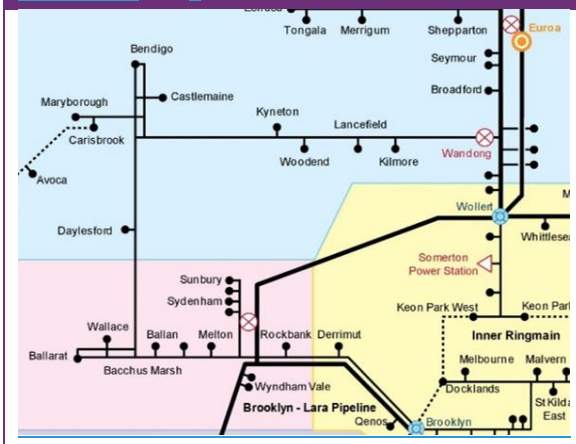
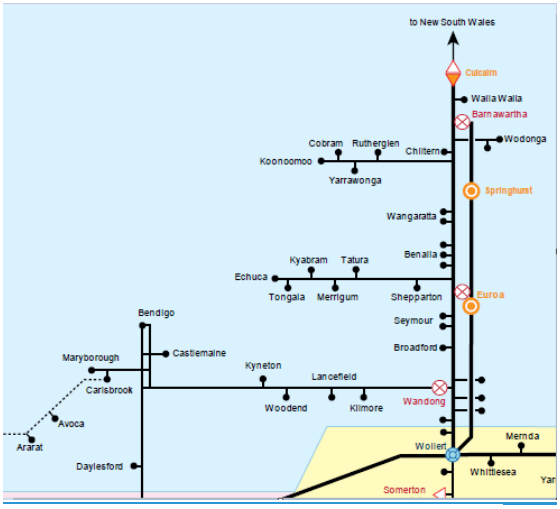
Table 4 An overview of the major ~~system~~ DTS pipelines and withdrawal zones (WZ~~Zones~~)

~~Note: information regarding major pipeline capacities may be found in the Victorian Gas Planning Review (VGPR).~~

Withdrawal Zones	Description
Gippsland  	~~**Longford to Gooding CS Inlet**~~ ~~This pipeline is used to transport Bass Strait gas from Longford to Gooding.~~ ~~Control is by the operation of Gooding compressor station (CS) and by rescheduling Longford injections.~~ ~~BassGas injections tend to reduce Longford nominal injection capacity in a ratio of approximately 3 to 1 (i.e. for every 30TJ injected at BassGas, the Longford injection capacity is reduced by 10TJ).~~ ~~Longford and Iona back off each other at high injection rates, depending on linepack levels.~~ **The Gippsland WZ is supplied from the eastern section if the Longford to Melbourne Pipeline (LMP), from Longford to Gooding CS Inlet, and the Lurgi Pipeline.** The Longford *gas production facility* is the main source of Victorian gas supply. It supplies the Gippsland WZ, which is composed of the section of the LMP from Longford to Gooding CS inlet and the Lurgi Pipeline from Morwell to the Dandenong CG. Pipeline control occurs by the operation of Gooding CS and by *scheduled injections* at Longford *gas production facility* along with the VicHub and TasHub *market injection points* and *market withdrawal points*. The VicHub *connection* allows for supply into the DTS from the Eastern Gas Pipeline (EGP) that runs from Longford to Sydney. The EGP is also connected to the Tasmanian Gas Pipeline (TGP). The TasHub *connection* allows for supply into the DTS from the TGP that runs from Longford to Tasmania (and also to the EGP). The main source of gas supply into the EGP and TGP is the VicHub Compressor Station that compresses gas from the Longford *gas production facility* into these pipelines. The Lurgi Pipeline is mainly supplied from the LMP at Tyers Pressure Reduction Station (PRS) and the Morwell PRS. Alternative supply to the Lurgi Pipeline is through the Morwell Back-up Regulator at Dandenong. This can be used during unusual demand scenarios or during maintenance on this pipeline.
~~**Lurgi**~~ 	~~**Lurgi pipeline**~~ ~~The Lurgi pipeline is normally supplied from the Longford to Melbourne pipeline at Tyers/Morwell.~~ ~~Alternative supply to the Lurgi pipeline is through the Morwell Backup Regulator at Dandenong. This can be used during unusual demand scenarios or in case of maintenance on this pipeline.~~
Melbourne	~~**Gooding-DCG and Pakenham-Wollert-Keon Park pipelines**~~ ~~This pipeline system consists of the Gooding to Dandenong pipeline, the Pakenham-Wollert pipeline and Wollert to Keon Park pipeline. It is used to supply Melbourne load, and for~~

Withdrawal Zones	Description
 	~~onward supply to Ballarat and Geelong zones via Brooklyn, and the Northern Zone via Wollert and Wandong.~~ ~~Control is by the operation of Gooding CS, Wollert CS, Wollert Pressure Limiter, Wollert city gate (CG) and the Dandenong CG.~~ **The Melbourne WZ has the majority of Victorian demand and is supplied from three sources:** • **The western section of the LMP from Gooding CS Outlet to Pakenham and Dandenong CG, and from Pakenham to Wollert CG;** • **The South West Pipeline (SWP) including the Brooklyn to Lara Pipeline (BLP) supplying Brooklyn CG, and the Western Outer Ring Main (WORM) to Wollert CG;** • **The Victorian Northern Interconnect (VNI) from Culcairn in New South Wales to Wollert CG.** Supply into the Melbourne Inner Ring Main is then provided via the Dandenong CG, Brooklyn CG and Wollert CG (via the Wollert to Keon Park pipeline). The Yarra Glenn/Lilydale CG also supplies then Inner Ring Main during periods of high demand. The LMP transports gas from the Longford *gas production facility*, the main source of supply for Melbourne demand. Outside of winter it can also provide supply to the Northern, Ballarat and Geelong WZs. Pressure control on the LMP is achieved by the operation of Gooding CS, Wollert CS, Wollert Pressure Limiter, Wollert CG and the Dandenong CG. *Scheduled injections* from the Lang Lang Gas Plant (BassGas pipeline) supplied into the LMP at Pakenham, and the Dandenong *LNG storage facility* near the Dandenong CG also provide supply to the Melbourne WZ. Supply to the Melbourne WZ via the SWP, BLP and the WORM is discussed in the Geelong WZ section, while supply via the VNI from Culcairn is discussed in the Northern WZ section.
Geelong  	~~**Corio and South West Pipeline (BLP and SWP, and BCP)**~~ ~~This pipeline system is used to transport gas from Iona to Geelong, Melbourne (through Brooklyn CG) and to the Ballarat zone. It also transports gas in the opposite direction from Melbourne to Geelong (via the Brooklyn to Corio Pipeline (BCP)) and Iona.~~ ~~Control is by operation of the Brooklyn CS, Winchelsea CS, Lara CG Brooklyn-Corio CG, Brooklyn-Lara CG and Brooklyn-Ballan (to Ballarat) PRS.~~ ~~The Brooklyn CS provides compression towards Iona while the Winchelsea CS provides compression towards Melbourne.~~ **The Geelong WZ is supplied from the SWP from Port Campbell (Iona), the WORM and the BLP from Longford via Wollert, and the Brooklyn to Corio (Geelong) Pipeline (BCP).** Gas from Port Campbell (Iona) transported via the SWP is the main source of supply to the Geelong WZ during winter or during periods of excess Port Campbell gas production. The Iona underground gas storage (UGS) is the largest source of gas supply by daily capacity at Port Campbell. The SWP, which becomes the BLP at Lara, is an important source of winter gas supply for the Melbourne WZ through the Brooklyn CG and through Wollert CG via the WORM. The BLP supplies Ballarat WZ including via the Plumpton PRS to Sunbury. Control of pressure in the SWP and BLP during winter is achieved by operation of the Winchelsea CS to increase flow, and the Lara SWP CG, which is the main supply path to Geelong (Corio CG), Plumpton PRS, Brooklyn-Corio pipeline CG, Brooklyn-Lara pipeline CG and Brooklyn-Ballan (to Ballarat) PRS. Outside of winter the Geelong WZ is supplied by the BLP and the WORM via Wollert, as part of the seasonal flow of gas to

Withdrawal Zones	Description
	Port Campbell to refill Iona UGS ahead of the next winter. Compression at Wollert controls the pressure and flow to the Geelong WZ and to Port Campbell. Winchelsea CS can also be operated tin increase the flow to Port Campbell. The Geelong WZ can also be supplied via Brooklyn CS flowing into the BCP or the BLP. The Geelong WZ has *market injection points* and *market withdrawal points* connected to Iona UGS, the Port Campbell to Adelaide (PCA) or SEA Gas pipeline, Mortlake Power Station pipeline and the Otway Gas Plant.
Western ~~Transmission System~~ 	~~**The Western Transmission System (WTS)**~~ ~~The WTS is supplied through the Iona CG or CS outlet. The WTS supplies Portland, Hamilton, Koroit, Warrnambool, Allansford, and Cobden. Primary control is by supply through the Iona CG outlet. Secondary control is by operation of Iona compressor.~~ ~~Compression at Iona may be required during withdrawals into storage. WTS load peaks in late winter/spring due to the increased activity of the food processing plants in the region.~~ **The Western WZ is supplied by the Western Transmission System (WTS).** The WTS is supplied through the Iona CG or Iona CS outlet. The WTS supplies Portland, Hamilton, Koroit, Warrnambool, Allansford, and Cobden. Primary flow and pressure control for supply into the WTS is via the Iona CG outlet with the Iona UGS facility as the main source of supply during the winter peak demand period. Secondary flow and pressure control is by the operation of the Iona CS. Compression at Iona may be required during periods of high Iona UGS withdrawals if sufficient flow and pressure cannot be maintained by SWP flow via Wollert CS and the WORM / BLP with compression at Winchelsea CS (as required). WTS load peaks in late winter and spring due to the increased activity of the milk processing plants in the region. To simplify the DWGM *scheduling* processes the Western WZ is incorporated into the Geelong WZ in the MCE Network Topology.
Ballarat 	~~**Brooklyn-Ballan (Ballarat) and Sunbury branch pipelines**~~ ~~This pipeline system is used to transport gas from Brooklyn to the Ballarat zone. Control is by operation of the Brooklyn CS and Brooklyn Ballan pressure reduction station (PRS).~~ ~~Ballarat zone loads are supplied mostly from Brooklyn and partially through Wandong, via Daylesford, depending on the pressure difference between Daylesford and Ballan. Wandong PRS is the controlling point for interaction between Ballarat and Northern zones.~~ ~~The Sunbury branch pipeline is supplied by one of two methods. Primarily, Sunbury is supplied from the South-West Pipeline (SWP) via the Truganina to Plumpton pipeline and Plumpton PRS. Alternatively, Sunbury is supplied from the Brooklyn to Ballarat pipeline when pressure in the SWP is low and a Brooklyn compressor is operating towards Ballarat.~~ ~~The Ballarat pipeline cannot be supplied from the SWP via the Sunbury branch due to the presence of a check valve.~~ **The Ballarat WZ is supplied via the Brooklyn to Ballarat Pipeline (BBP) and the Sunbury Lateral.** The BBP is used to transport *gas* from Brooklyn to the Ballarat CG. During the winter peak demand period supply to Ballarat CG is from the BLP via the BBP PRS at Brooklyn. During higher winter demand periods in Ballarat, sufficient supply flow and pressure control is achieved through the operation of a compressor at the Brooklyn CS. Outside of winter Ballarat WZ loads are supplied mostly from Brooklyn via the Inner Ring Main from Dandenong CG.

Withdrawal Zones	Description
	Limited supply in the BBP can also be made available from the Wandong PRS on the VNI via Daylesford, depending on the pressure difference between Daylesford and Ballan. The Wandong PRS is the controlling point for interaction between the Ballarat and Northern WZs. The Sunbury Lateral has two sources of supply. The WORM *connects* the Pakenham to Wollert Pipeline and the SWP allowing the Sunbury Lateral to be supplied from either Longford or the VNI, or from Port Campbell (Iona). Alternatively, the Sunbury Lateral can be supplied from the BBP via the Inner Ring Main as noted above. Brooklyn compression is directed towards Ballarat can also be used to support Sunbury Lateral demand on moderate winter demand days. The BBP cannot be supplied from the Plumpton PRS on the WORM via the Sunbury Lateral due to the presence of a check valve preventing backflow.
Northern  	~~**Northern system (incl. Interconnect)**~~ ~~This pipeline system is used to transport gas from Wollert northward, as well as to import NSW gas at Culcairn via the Interconnect. Control is by operation of the Culcairn Regulator, Wollert CS, Springhurst CS, Euroa CS and the Wollert, Wandong, Glenrowan and Euroa pressure limiters.~~ ~~Import capacity decreases with decreasing system demand, a reduction in available compressors or operational constraints in NSW.~~ ~~Maximum export capacity is achieved through use of the Wollert, Euroa and Springhurst compressor stations and optimisation of the Northern Zone linepack.~~ ~~The pipeline between Wollert and Culcairn has been partially looped to increase the export capacity at Culcairn.~~ **The Northern WZ is supplied from the Victorian Northern Interconnect (VNI) including the Wandong to Bendigo, Shepparton to Echuca, and Chiltern to Koonoomoo laterals** The Northern WZ is usually supplied from the Wollert CS that transports gas northward. Gas is suppled to Wollert CS from the LMP or the WORM. During the winter peak demand period the Northern WZ is also supplied by *gas* imports into the DTS via Culcairn, which is supplied from the Young CS on the Moomba to Sydney Pipeline. The VNI consists of a larger high pressure pipeline with compression to manage gas flows and linepack between Wollert and Culcairn, while the smaller lower pressure pipeline supplies individual delivery points including the three regional supply laterals. Flow and pressure control is in the Northern WZ is achieved by the operation of the Wollert CS, Euroa CS and Springhurst CS, and the Wollert, Wandong, and Euroa PRSs. Imports into the DTS via Culcairn are usually limited by demand and operational constraints north of Culcairn. Springhurst CS and Euroa CS are operated as necessary to match VNI import capacity with Culcairn supply capacity. During periods of high supply from Culcairn import flows via the VNI can also supply the Melbourne WZ. Maximum export capacity from the DTS via Culcairn is achieved through the use of Wollert, Euroa and Springhurst compression and optimisation of VNI pipeline linepack. Two Wollert compressors may be operated during very high export flows via Culcairn and to manage LMP pressure and linepack.

~~2.2.~~3. Threat to system security

A threat to system security may eventuate if a normal operating state ~~(as defined in Chapter 3)~~ cannot be maintained.

~~2.2.1.~~3.1. Notice of threat to system security

Under rule 341(1), if AEMO reasonably believes there is a threat to system security, it must provide Registered participants without delay details of that threat to system security, including AEMO's estimate of:

(a) The nature and magnitude of the threat, including the likely duration of the threat and the likely shortfall in *gas* supplies likely to occur during that period;

(b) Whether AEMO needs to intervene in the *market* to avert the threat and the time by which intervention will be required if the threat has not subsided; and

(c) The WZ ~~*system withdrawal zones*~~ within the ~~*DTS*~~ *Market* in which the threat to system security is likely to be located.

AEMO may issue a notice requiring Registered participants to provide estimates of the information specified in rule 341(2). This includes, but is not limited to:

(a) whether the *Registered participant* may make additional injections or withdrawals of *gas*;

(b) whether the *Registered participant* is in a position to inject non-firm *gas* into the *Market*~~declared transmission system~~; and

(c) whether the *Registered participant* is in a position to inject *off-specification gas* into the *Market*~~system~~.

Additionally, AEMO may request whether the Registered participant is in a position to voluntarily reduce industrial load.

Under rule 341(5), AEMO must inform Registered participants immediately when it reasonably considers a threat to system security to be at an end.

~~2.3.~~3.2. Responses to a threat to system security

AEMO responds by implementing the following if a threat to system security is identified.

The ~~below~~ list below is presented in order of preference, however specific circumstances may require a different order based on outcomes of a risk assessment.

The *gas scheduling procedures*, include all of AEMO's potential *market* responses to a threat to *system security*.

1. Market response

AEMO may determine that a threat to system security will subside without intervention (i.e. a *market* response will alleviate the threat). Under rule 342, AEMO must provide details of the existence of the threat to system security to Registered participants and what actions they would be required to take or refrain from taking in order to prevent AEMO from intervening.

A *market* response to alleviate a threat to system security includes re-bidding to increase or decrease the amount of *gas* injected or withdrawn at *market injection points* or *market withdrawal points* ~~within the DTS~~.

2. AEMO injecting out of merit order gas in the next operating schedule

AEMO may identify that a threat to system security can be alleviated through *scheduling* out of merit order gas (including from an *LNG storage facility*) in the *operating schedule* at the times specified in rule 215(3) as per rule 343(1).

3. Publishing ad-hoc operating schedules

AEMO may alleviate a threat to system security by publishing ad hoc *operating schedules* at times other than the times specified in rule 215(3), under rule 215(4). The~~se~~ ad hoc *operating schedules* may require the *scheduling* of out of merit order gas (including from an *LNG storage facility*).

4. Directing participants to inject or withdraw gas

Should it be available, AEMO may direct participants to inject or withdraw *off specification gas*, non-firm *gas*, or *gas* that has not been bid into the *market* under rule 343(1) and section 91BC of the NGL. *Gas* accepted under rule 289(5)(b)(i) is not considered a direction.

5. Curtailment

AEMO may, under section 91BC of the NGL and rule 343, enact *curtailment* in accordance with the ~~emergency curtailment list and the Gas Load Curtailment, Gas Recovery and Rationing Guidelines~~*gas emergency protocol* where the threat to *system security* cannot be alleviated through other means.

Note: Options 3-5 are interventions under the ~~NGR~~Rules.

~~2.4.~~4. Monitoring and assessment of threats to system security ~~by AEMO~~

AEMO monitors the following operational factors for the purposes of identifying any material deviation from plans or forecasts that may cause a potential threat to *system security*:

(a) system pressures,

(b) *gas* flows,

(c) forecast and actual supply/demand balance,

(d) ~~System~~ withdrawal zones (WZs); and

~~(d)~~(e) linepack ~~zonal~~zones ~~*linepack*~~.

From these indicators, AEMO determines whether the DTS is trending towards a threat to system security. If it does, an operational strategy to avert or manage the threat will be developed based on the results of computer simulations and operational experience.

The following are key areas monitored by AEMO to ~~ensure~~ maintain system security with descriptions of contributing factors.

~~2.5.~~4.1. Linepack and distribution of linepack

A large discrepancy between actual and expected linepack, or a large discrepancy in linepack distribution increases the risk of breaching pressure obligations. System security is more reliant on linepack and linepack distribution variability on high demand days and when gas-fired power generation~~generation (GPG)~~ is operating.

A key operational objective is to achieve suitable starting conditions at the beginning of day (BoD), that is, BoD linepack that is adequate to meet the forecast level of demand taking into account the expected demand profile for that day. Linepack distribution is managed intra-day through the operation of compressors and changing regulator settings ~~points~~ as required.

The linepack zones within the DTS include the Gippsland, Melbourne, Geelong, Ballarat and Northern zones, and broadly align to the WZs described in Table 4.

4.2. Withdrawal zones

AEMO manages threats to system security by WZ which are described in Table 4 and include the Gippsland, Melbourne, Geelong, Ballarat and Northern WZs.

These WZs represent the aggregation of custody transfer meters (CTMs) at which *gas* is withdrawn from the *Market* in each WZ or region.

4.3. Weather forecast change

Unexpected cold weather results in an increase in demand on the DTS and a greater depletion of linepack throughout the day, which means that the risk of a breach of minimum system pressure is materially increased. The risk ~~for~~ of a threat to *system security* eventuating is exacerbated ~~even higher~~ if the BoD linepack is below target. Note that the linepack target varies seasonally.

Unexpected warm weather may results in linepack being above target. For example, Longford pipeline capacity is particularly sensitive to increased linepack and can impact on secure supply from the Longford *Ggas production facilityPlant*. Therefore, linepack requires management through the use of the Gooding CScompressors station and overnight rescheduling at the next *scheduling horizon* for the *gas day*.

The risks posed by weather forecast changes are reducedminimised by re*scheduling* the *market*gas five times a day and frequently monitoring for changes in weather. Any potential adverse *scheduling* outcomes are managed to the greatest extent possible by rescheduling operating compressors to move linepack as appropriate.

AEMO may employ *demand forecast overrides* in *operating schedules* if *demand forecasts* by *Market Participants* do not adequately account for forecast weather conditionsforecast changes.

2.6.4.4. Availability and locality of gas supply

Aggregate *gas* supplies offered to the *Market* on each *gas day* from the system *market injection points* may vary from day to day. Supply is dependent on the capacity of the DTS to transport *gas*, given the operating conditions on the day.

Supply problems, such as when a *gas production facilityProducer*, or S*storage facilityProvider* or *blend processing facility* has not been able to meet *operating schedule*d injection *flow rates*, particularly in the first half of the *gas day*, can pose material risks to *system security* and require rapid operational response(s), including such as *publishing* an ad-hoc *operating schedule*, which may require*ing* injection from an *LNG storage facility*liquefied natural gas (LNG) injection or load *curtailment*.

Less critical issues created by supply restrictions can be managed intra-day through rescheduling *gas* at each *scheduling trading horizon*intervals for the remainder of the *gas day*.

4.5. Storage facility capacity

2.6.1.4.5.1. Storage facility capacity utilisation

AEMO monitors the *storage facility* capacity utilisation of each *storage facility* to reduce the risk of there being insufficient *gas* supply available at the start of, and during, the winter period. If *storage facility* capacity utilisation is low, or there is a rapid decrease in gas held in storage, this may lead to the insufficient supply of *gas* during the winter period to meet peak day demand. This would result in AEMO informing *Registered participants* of a threat to *system security* for the winter period.

4.5.2. Dandenong LNG Plant storage facility Capacitycapacity

The firm Dandenong *LNG storage facility* injection *flow rate* is 100 t/h. The maximum non-firm *flow rate* of 180 t/h can be sustained for a limited period but uses all redundant capacity in the Dandenong *LNG storage facility*plant.

AEMO monitors the Dandenong *LNG storage facility*plant capacity because a loss of Dandenong *LNG storage facility* injection capacity during high demand periods increases the risk of load *curtailment*.

~~2.7.~~4.6. Gas-fired power generation

Depending on system demand and operating conditions on the day, planned or unplanned ~~GPG~~ gas-fired power generation operation can rapidly deplete linepack and pose a threat to *system security*. This is because the potential maximum hourly quantity (MHQ) of ~~GPG the~~ gas-fired power generators can be very high relative to the hourly demand from all other industrial and commercial *gas customers*. Operational readiness is maintained by frequent monitoring of the National Electricity Market (NEM) reserve levels and the NEM spot price for Victoria, both of which may trigger gas-fired power generator operation.

The VGPR includes information on the capacity of the DTS to support gas-fired power generation.

4.7. Availability of gas supply and DTS assets

A weekly and daily review of planned (i.e. maintenance) outages of *gas production facilities, storage facilities, blend processing facilities,* compressors, regulators and other key DTS assets is required to assess any material impact on capacity and potential risk to system security, and to formulate AEMO's response. AEMO conducts maintenance planning ~~and coordination conducted~~ in accordance with the *maintenance planning procedures* and rule ~~NGR~~ 326 of the NGR.

4.8. Gas quality

Gas injected at all *market injection points* must comply with the *gas quality monitoring* ~~*Guidelines*~~*procedures*. If ~~gas is out~~ *of*~~-~~*specification gas* injections occur, actions may be required as specified in the *gas quality monitoring* ~~*Guidelines*~~ *procedure* or the ~~NGR~~Rules.

4.9. SCADA system availability

The availability of the SCADA system that AEMO uses to monitor and operate the DTS is critical to maintaining system security. The probability of SCADA system unavailability is minimised by having appropriate redundancy in both the SCADA system and the communications to critical DTS assets.

4.10. Declared distribution systems

The *declared distribution systems* (*DDS*) are operated by the *Distributors*. The *DTS* supplies *gas* to the *DDS*. Therefore, a threat to *system security* in the *DTS* may cause a *gas* supply issue for the *DDS* that results in a threat to *system security* in the *DDS*. However, a threat to *system security* in the DDS are managed by the *Distributor*.

AEMO's emergency powers are covered under the *gas emergency protocol* and apply to the DDS.

Version release history

Version	Effective date	Summary of changes
1.1	16 December 2015	Update to reflect changes to the DTS. Clarifications made around normal operating state and threats to system security. General improvements to clarity. Removal of critical location pressures as a separate document has been created to cover this.
1.0	1 July 2010	Rebranded and updated to reflect the transition of the MSOR to the NGR
MSOR 9	24 March 2009	Last version under the Victorian Market and System Operating Rules (MSOR)