WHOLESALE MARKET SYSTEM SECURITY PROCEDURES (VICTORIA)

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CHAPTER 1 - PRELIMINARY

1.1 Introduction

These are the procedures made under rule 205(1) of the National Gas Rules (**Rules**).

1.2 Definitions

Terms defined in the Law and Part 19 of the Rules have the same meaning in these procedures unless defined in these procedures or the context otherwise requires.

The following definitions apply in these procedures unless the context otherwise requires.

BLP means Brooklyn to Lara pipeline.

BoD means the beginning of a gas day.

CG means City Gate.

Contingency means an event, incident or situation that may pose a threat to system security (eg. failure in essential operational facilities causing the loss of transmission capacity).

CS means Compressor Station.

GPG means Gas fired power generation.

DCG means Dandenong City Gate.

DTS means Dandenong Terminal Station.

Interconnect means the Barnawartha to Culcairn 10,200kPa pipeline linking the Northern zone to New South Wales.

linepack reserve means linepack above the absolute minimum linepack, required to ensure system pressures will remain above their minimums at all locations during periods of peak demand.

MAOP means Maximum Operating Pressure (Pipeline).

MinOP means Minimum Operating Pressure (Pipeline).

MHQ means Maximum Hourly Quantity.

Northern zone is described in Table 1.

SWP means the South West Pipeline (Iona to Lara).

Shoulder means the months of October and November and the months of March and April.

Summer means the months of December to February inclusive.

Winter means the months of May to September inclusive.

1.3 Scope

These procedures provide for the operation of the declared transmission system in a way that averts or minimises threats to system security.

These procedures are not exhaustive and do not cover every possible situation. They contain information based on methodologies and assumptions that may not be applicable in every situation, and represent general principles applicable in most situations, subject at all times to exceptions. Where a Contingency is of such severity that it cannot be managed using the principles and strategies in these procedures, AEMO may implement the emergency protocol.

These procedures do not provide information concerning the management of gas quality, scheduling or emergencies. These processes and requirements are covered in the gas quality specifications, gas scheduling procedures, and the emergency protocol, respectively.

CHAPTER 2 – NATURE OF THE DECLARED TRANSMISSION SYSTEM

The declared transmission system consists of several major pipelines and laterals supplying the metropolitan and regional zones. Each of the major pipelines is characterised by its own dynamics in regard to demand, flows, linepack and pressures as shown in Figure 1 and Table 1 in these procedures. AEMO will seek to exercise operational control of the declared transmission system in a way that ensures a secure state for each major pipeline, and therefore results in security of the system as a whole.

CHAPTER 3 – NORMAL OPERATING STATE

The declared transmission system is in a normal operating state when all of the following conditions are met:

(a) the declared transmission system is operating within the requirements of the gas quality procedures and breaches of the gas quality specifications do not require intervention by AEMO;

(b) in AEMO's reasonable opinion there is no 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 flows are within, and forecast to be within (given the observed and anticipated rates of change) the agreed operating limits specified in Table 2. Each of the following is an example of when this condition is met:

the available declared gas transmission system assets provide adequate capacity to meet forecast gas supply and demand conditions;

sufficient information is available to assess the state of the declared transmission system; and

the effects of unplanned events that affect the state of the declared transmission system can be controlled by operational responses such as, publishing an ad hoc operating schedule, changing the operation of compressors, changing the regulator set pressures, injection of LNG and declaring an emergency and curtail load.

CHAPTER 4 – MONITORING BY AEMO

AEMO must monitor the following operational factors for the purposes of identifying any material deviation from plan or forecast that may cause a potential threat to system security.

4.1 System linepack and distribution of system linepack

A large discrepancy between actual and expected system linepack, or a large discrepancy in system linepack distribution increases the risk of breaching pressure obligations. System security is more reliant on linepack and linepack distribution variability on days of high demand, and in particular when GPG is operating. A key operational objective is to achieve suitable starting conditions at the beginning of each gas day, that is, a beginning of day linepack that is adequate to meet the forecast level of demand taking into account the expected within day demand profile.

4.2 Net exports and withdrawals into storage at Iona

Iona withdrawals occurring in Shoulder and Winter seasons results in an effective reduction in system linepack reserve of between 20 TJ to 30 TJ. If such withdrawals are occurring, significant system security risks may arise due to:

significant reduction in SWP BoD linepack, reducing transmission capacity to Melbourne;

reduction of usable linepack in the Longford-DCG Inlet pipeline and Pakenham-Wollert pipeline, as well as overall system linepack, due to increased gas transportation requirements; or

compression at Brooklyn is at a maximum, which leaves no redundancy at Brooklyn CS.

An effective reduction in system linepack reserve of between 20 TJ and 30 TJ would be created by those withdrawals into storage at Iona between May and September. This may prevent the BoD system linepack target being achieved and also force higher injections at Longford with the risk of Esso supply back off and potential for plant trips. The loss of system linepack reserve increases the risk to system security particularly on high demand days.

4.3 Net Exports to NSW at Culcairn

The declared transmission system has very limited capacity to export gas in Winter at Culcairn due to high differential pressure required from Wollert to Culcairn.

Exports to NSW require sustained compression at Wollert CS and have a small impact on linepack distribution. Linepack tends to be packed in the Northern zone at the expense of linepack in the Gooding to DCG and Pakenham to Wollert pipelines.

4.4 Weather forecast change

The advent of surprise cold weather results in an increase in demand on the declared transmission system and GPG demands and, therefore, greater depletion of linepack throughout the day. On such days, the risk of a breach of minimum system pressure is materially increased. The risk for system security is even higher if the BoD linepack is below target.

The advent of surprise warm weather results in system linepack being built up above target. Longford pipeline capacity is particularly sensitive to increased linepack and can impact on secure supply from Longford. Therefore, linepack requires management by use of Gooding compressors and overnight rescheduling.

4.5 Availability and locality of gas supply

Aggregate gas supplies offered to the Market on each gas day from the primary system injection points may vary from day to day. Supply is dependent on the capacity of the declared transmission system to transport gas given the operating conditions on the day.

Supply problems, such as when a Producer or Storage Provider has not been able to meet scheduled injection rates particularly in the first half of the gas day, may create material risks to system security and require rapid operational response(s), such as publishing an ad hoc operating schedule, requiring LNG injection or load curtailment.

4.6 LNG plant capacity

The contracted firm LNG injection rate is 100 t/h. The maximum non-firm rate of 180 t/h can be sustained for a limited period but uses all redundant capacity in the LNG plant. A loss of LNG injection capacity, during peak periods, increases the risk of load curtailment.

4.7 Gas power generation

Depending on system demand and operating conditions on the day, planned or unplanned GPG can rapidly deplete linepack, with potential risk to system security. The potential MHQ of GPG can be very high relative to the hourly demand from all other industrial and commercial gas customers.

The Victorian Annual Planning Report includes information on the capacity of the declared transmission system to support GPG.

4.8 Availability of gas transmission assets

A weekly and daily review of planned (maintenance) outages of compressors, regulators and other key transmission assets is required to assess any material impact on capacity and potential risk to system security, and to formulate AEMO's response.

4.9 Gas quality

Gas injected at all injection points must comply with the gas quality specifications. If gas is out of specification, actions may be required as specified in the gas quality specifications or the Rules.

CHAPTER 5 – DECLARED TRANSMISSION SYSTEM PIPELINES

The declared transmission system consists of six major pipelines and laterals supplying the metropolitan and regional zones. Each of the major pipelines is characterised by its own dynamics in regard to demand, flows, linepack and pressures. Ensuring a secure state for each major pipeline, by operational control, results in security of the declared transmission system as a whole.

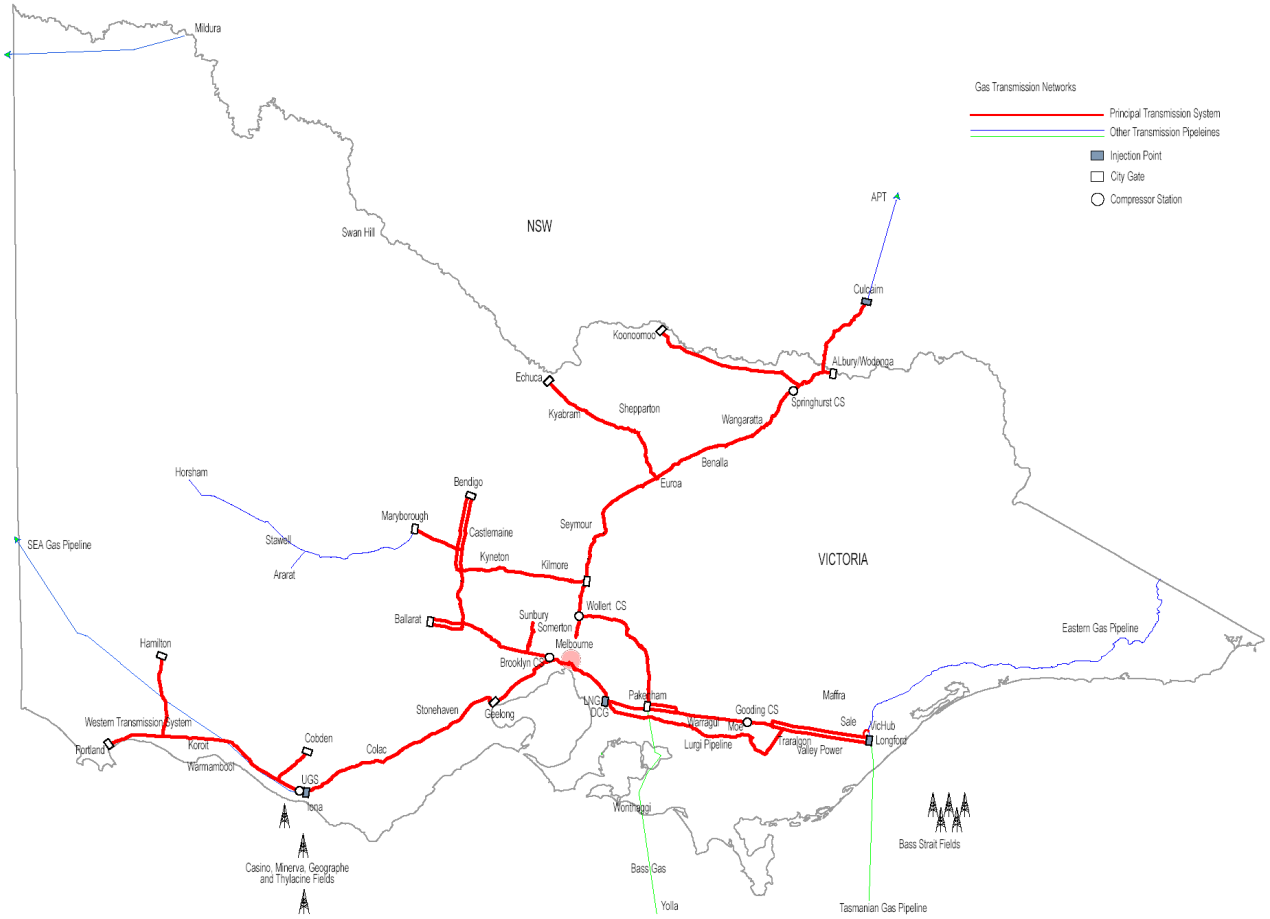
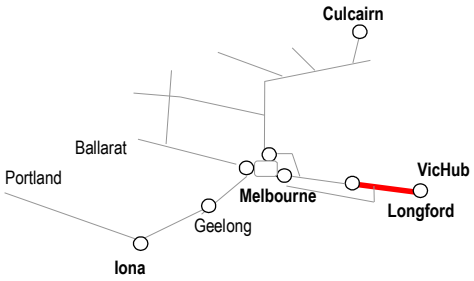
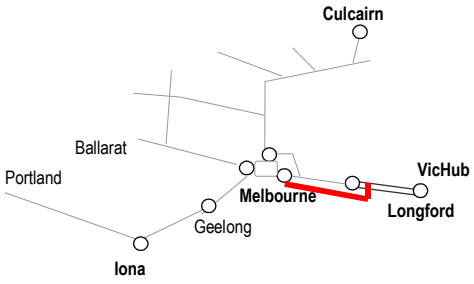
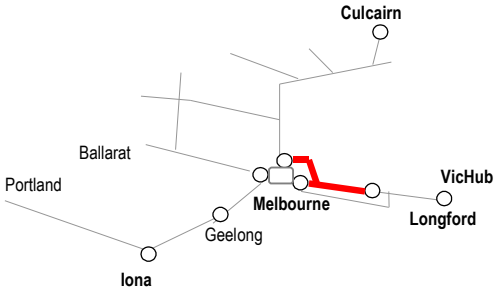
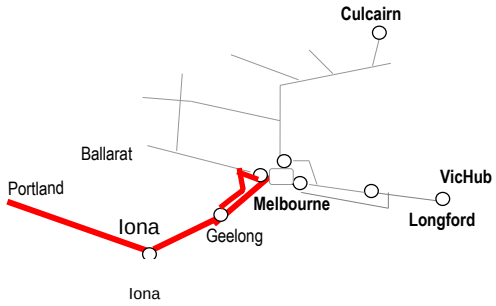
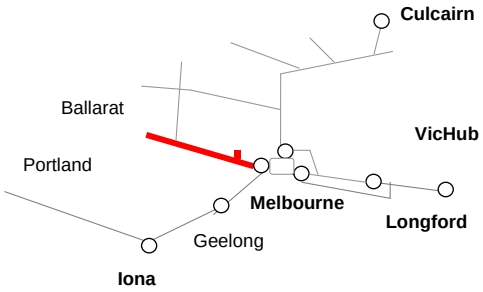
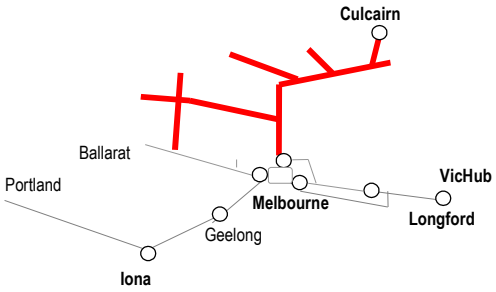


Figure 1 DECLARED TRANSMISSION SYSTEM PIPELINES

Table 1: AN OVERVIEW OF THE MAJOR SYSTEM PIPELINES (ZONES)

Gippsland  	Longford to Gooding Inlet This pipeline is used to transport Bass Strait gas from Longford to Gooding. Control is by the operation of Gooding CS and by rescheduling Longford injections. Nominal injection capacity at Longford (from Esso and VicHub) is 990 TJ/d. BassGas and Iona injections reduce nominal injection capacity at Longford. BassGas injections tend to reduce Longford nominal injection capacity in a ratio of approximately 2 to 1. For BassGas injections at a maximum rate of 67 TJ/d Longford capacity reduces to around 960 TJ/d, but the total Longford pipeline transmission capacity is increased to 1,030 TJ/d. Longford and Iona back off each other at high injection rates, depending on linepack levels.
Lurgi  	Lurgi pipeline The Lurgi pipeline capacity is around 65 TJ/d. Significant load is off the end of the Lurgi pipeline at DTS. Alternative supply to the Lurgi pipeline is through the Morwell Backup Regulator at Dandenong. This can be used under unusual demand scenarios or cases of maintenance or works on this pipeline.

Melbourne  	Gooding-DCG and Pakenham-Wollert-Keon Park pipelines This pipeline system consists of Gooding to Dandenong, the Pakenham-Wollert pipeline and Wollert to Keon Park pipeline. It is used to supply Melbourne load, and for onward supply to Ballarat and Geelong Zones via Brooklyn, and the Northern zone via Wollert. Control is by the operation of Gooding CS, Wollert CS and the Wollert Pressure Limiter. Nominal BassGas (near Pakenham) injection capacity is 67 TJ/d.
Geelong  	Corio pipeline and South West Pipeline (SWP + BLP) This pipeline system is used to transport gas from Iona to Geelong, Melbourne (through Brooklyn CG) and to Ballarat zone. It also transports gas in the opposite direction from Melbourne to Geelong and Iona. Control is by operation of the Brooklyn CS, Lara City Gate, Brooklyn-Corio City Gate, Brooklyn-Lara city gate and Brooklyn (to Ballarat) Pressure Limiter. The Corio + SWP + BLP nominal transmission capacity to Melbourne is 347 TJ/d in Winter. Each 1,000 kPa of pressure in the Corio + SWP + BLP equates to about 20 TJ of linepack in the Corio + SWP + BLP. In Summer, the maximum SWP capacity from Melbourne to Iona is up to 45 TJ/d with one Centaur compressor operating and up to 129 TJ/d with two Centaur compressors operating at Brooklyn. The Western Transmission System (WTS) The WTS is supplied through Iona CG Outlet. The WTS supplies Portland, Hamilton, Koroit, Warrnambool, Allansford, and Cobden. Primary control is by supply through Iona CG Outlet. Secondary control is by operation of Iona compressor and Iona City Gate. WTS capacity is up to 20 TJ/d, depending on Iona

	pressure Compression at Iona is 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.
Ballarat  	Brooklyn- Ballan (Ballarat) and Hopkins Rd-Sunbury (Sunbury) pipelines This pipeline system is used to transport gas from Brooklyn to the Ballarat zone. Control is by operation of Brooklyn CS and Brooklyn Pressure Limiter. Ballarat Zone loads are supplied mostly from Brooklyn and partially through Wandong, via Daylesford, depending on the pressure difference between Daylesford and Ballan. Wandong Limiter is the controlling point for interaction between Ballarat and Northern zones.
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, and the Wollert, Wandong and Clonbinane Limiters. Import capacity from NSW is up to 50 TJ/d, depending on the local and NSW operating conditions. Imports over 30 TJ/d may require Springhurst compression. Import capacity up to 90 TJ/d could be available with use of compression at Young and Springhurst. Export capacity to NSW is 10 to 50 TJ/d, depending on system demand and operating conditions on the pipeline. Exports are operationally feasible in Summer and Shoulder seasons, while very limited in Winter.

CHAPTER 6 – CRITICAL LOCATIONS

AEMO's objective is to maintain operating pressures between the relevant MAOP and MinOp across the declared transmission system. Table 2 shows the list of critical locations and associated pressure requirements.

Other locations on the declared transmission system are generally located between these critical locations. Their pressures are normally interpolated from pressures of adjacent upstream and downstream critical locations.

Any operational response taken to restore or maintain system security at a location will take into consideration any secondary effects on other locations within the system.

AEMO will operate the declared transmission system so as to meet connection pressure requirements across the declared transmission system to the extent reasonably possible, and, where flows are within the limits specified in the relevant schedules in connection deeds and connection agreements. In the cases where such flow limits are exceeded at a connection point, AEMO will use all reasonable endeavours to meet pressure requirements at that point.

Table 2: CRITICAL LOCATIONS ON DECLARED TRANSMISSION SYSTEM

	MAOP in kPa	MinOP in kPa	
Longford (with VicHub)	6,890		Pipeline Licence pressure
Sale		4,800	AEMO-Distributor Connection Deed
Morwell CG	2,760		Lurgi pipeline licence pressure
Pakenham South		1,400	AEMO-Distributor Connection Deed
DTS		2,650	AEMO-Distributor Connection Deed Maintaining the DCG Inlet Guideline Pressure ensures maintenance of DTS Pressure Obligation
Dandenong North		2,500	AEMO Connection Deed Maintaining the DCG Inlet Guideline Pressure ensures maintenance of Dandenong Nth

			Pressure Obligation
Brooklyn (Melbourne side)		1,700 1,800	AEMO-Distributor Connection Deed Brooklyn compressor suction min pressure requirement
Wollert	7,400		Wollert-Wodonga Pipeline Licence pressure
Keon Park		2,200	AEMO-Distributor Connection Deed
Corio	7,390	2,100 w 1,900 s	7,390 kPa Pipeline Licence pressure 2,100 kPa in Winter, 1,900 kPa in Summer, Distributor Connection Deed
BLP	10,000	 3,800	10,000 kPa Pipeline Licence pressure 3,800 kPa approved AEMO-Distributor Connection Deed (Wyndham Vale)
Iona (SWP) Iona (WTS)	10,000 7,400	 3,800	10,000 kPa Pipeline Licence pressure 7,400 kPa Pipeline Licence pressure 3,800 kPa Operating Agreement
Iluka		2,500	APA Group-Distributor Connection Deed
Portland		2,800	AEMO-Distributor Connection Deed
Bendigo		3,000	AEMO-Distributor Connection Deed
Maryborough		3,000	AEMO-Distributor Connection Deed
Shepparton		2,400	AEMO-Distributor Connection Deed
Wodonga		2,400	AEMO-Distributor Connection Deed
Sunbury		1,100	AEMO-Distributor Connection Deed
Ballarat		2,000	AEMO-Distributor Connection Deed