WHOLESALE MARKET GAS SCHEDULING PROCEDURES (VICTORIA)

PREPARED BY: ~~Market Performance~~Gas ~~Systems~~Real Time Operations

VERSION: ~~1.~~2.0

DATE: ~~1 May 2012~~April ~~4~~ May 2015

FINAL

The document commences operation on ~~1 May 2012~~April ~~4~~ May 2015 and the version of the National Gas Rules applicable at that date shall apply.

Approved for distribution and use

Matt Zema
Managing Director and Chief Executive Officer, AEMO

Date / /~~2012~~2015

Version Release History

VERSION	DATE	AUTHOR	PEER REVIEW	APPROVED	COMMENTS
2.0	4 May ~~1 April~~ 2015	Jian Ping Lu	Luke Garland		Procedures updated to include; • Addition of Table 2: Acronyms Definitions • addition of abnormal scheduling conditions 7 and 8; • addition of Transmission Constraint (NFTC); • declaration of a Threat to System Security prior to publishing an ad hoc schedule; • addition of notification process for scheduling peak-shaving *LNG* during a *standard schedule time* as an operational response; • removal of the procurement of pipeline commissioning gas from Section 3.6.2; and • general updating to improve the overall clarity of the Procedures.
1.2 (NGR)	1 May 2012	Jian Ping Lu	Louis Chen	Matt Zema	Procedures updated to reflect that the hedge nomination and AMDQ nomination information is used for determining ITR and *AMIQ*, and that *Market Participants* can: • submit *injection hedge nominations* and *agency injection hedge nominations* by *close proximity injection point*; • update the submitted *AMIQ profile* in reschedules in accordance to the Rules; and • nominate and renominate *authorised MDQ* and *AMDQ credit* to *system injection points* via the new AMDQ nomination WebExchanger screen. Other changes include: • added clause 3.1A to provide the reference to Demand Override Methodology; and • changes made to improve the overall clarity of the Procedures.
1.1 (NGR)	1 April 2011	Jian Ping Lu	Louis Chen	Matt Zema	Updated to reflect supply and demand point constraints at *system injection points* with multiple supply sources, and directional flow point constraints applied to a group of selected pipeline points
1.0 (NGR)	1 July 2010	Jian Ping Lu		Matt Zema	Rebranded and updated for NGR
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~~4.3~~	~~11 Septem~~				

	ber 2006				
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1.2	24 Februar y 1999				

This document has been created by theAEMO Gas System Operations and will be reviewed from time to time.

Any queries or suggestions for improvement should be addressed to Jian Ping Lu on (03) 9609 8465 or at JianPing.Lu@aemo.com.au.the AEMO Support Hub <Supporthub@aemo.com.au>

Important Notice

These Procedures are made by AEMO under rule 206(4) of the National Gas] Rules (NGR), and have effect only for the purposes set out in the NGR. The NGR and the National Gas Law prevail over these Procedures to the extent of any inconsistency.

~~Disclaimer~~

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Contents

GLOSSARY

(a) In this document, a word or phrase ~~*in this style*~~ in italics has the same meaning as given to that term in the National Gas Law (**NGL**) or National Gas Rules (**NGR**).

(b) In this document, ~~capitalised words or phrases or acronyms~~ capitalised terms ~~that are not defined in the NGR~~ have the meaning set out opposite those ~~words, or phrases~~terms~~, or~~ in Table 1 ~~below~~.

~~(b)~~(c) In this document, acronyms have the meaning set out opposite them in Table 2.

~~(c)~~(d) Unless ~~the context otherwise requires~~a contrary intention appears, this document will be interpreted in accordance with Schedule 2 of the ~~National Gas Law~~NGL.

TERM	MEANING
~~AMDQ~~	~~*authorised MDQ* or *AMDQ credits*.~~
AMDQ nomination	A proportion of its AMDQ for a *close proximity injection point* that a *Market Participant* nominates to AEMO for each *system injection point* in that *close proximity injection point* for the purpose of determining its injection right at each *system injection point*.
Cut-Off Time	The time after which a *Market Participant submission* ceases to apply for a *scheduling horizon*. This cut-off time is normally two hours before the day-ahead midnight *standard schedule time*, and one hour before other *standard schedule times*.
Demand Override Methodology	The methodology published under clause 3.1A.
~~DFPC~~	~~A Directional Flow Point Constraint applied to two or more points on a pipeline in accordance with clause 3.9.~~
Facility Operator	~~Means a:~~ (a) A *Producer*; (b) An *interconnected transmission pipeline service provider*; or A *Storage Provider* (c) .
Feasible Operating Schedule	An *operating schedule* that is physically achievable within operating pressures between the relevant maximum allowable and minimum operational pressures across the DTS
Gas Emergency Protocol	The collection of documents at http://www.aemo.com.au/Gas/Policies-and-Procedures/Gas-Emergency-Procedures.
Inject Right	The priority of *bids* in accordance with rule 214.
~~Market Clearing Engine (MCE)~~	~~Optimisation software that determines operating and pricing schedules.~~

MCE Factors	Mathematical constants used in the MCE algorithm such as *gas* properties and characteristics, linearisation steps used by the Market Clearing Engine and *VoLL*.
Node	A point on a pipeline used to define the pipeline network for a mathematical model for the purpose of *scheduling* by the Market Clearing Engine, such as a junction, a *supply point*, *delivery point*, an inlet or an outlet of a connected facility (e.g. compressor) used to define the pipeline network for a mathematical model for the purpose of *scheduling* by the Market Clearing Engine.
Normal State	The declared transmission systemDTS is in a Normal State when all of the following conditions are met: (a) it is operating within the requirements of the Gas Quality GuidelineGuidelines and breaches of the gas quality specifications as specified in the Guidelines do not require intervention by AEMO; (b) system pressures and flows are within, and forecast to remain within, the operating limits specified in the Wholesale Market System Security Procedures; and (c) in AEMO's reasonable opinion there is no threat to: (i) public safety; or (ii) the supply of *gas* to end users.
~~QDIFF~~	~~An Intra-day adjustment applied to operating schedules and pricing schedules, by AEMO clause in accordance with clause 3.11.~~
~~SCADA~~	~~A real time supervisory control and data acquisition system that processes data used in the management of the declared transmission system.~~
~~Supply Demand Point Constraint or (SDPC)~~	~~A constraint applied to a *system point*, by AEMO in accordance with clause 3.8.~~
Valid Pricing Schedule	A *pricing schedule* that achieves competitive *market price* outcomes by *scheduling* the lowest-priced *injection bids*, the highest-priced *withdrawal bids* and *demand forecasts*, within the accreditation of *controllable quantities* and the capacity limitations at *connection points*.
WebExchanger	An electronic system used by *Market Participants* to submit information to AEMO.

Table 1: Terms Definitions

ACRONYMS	MEANING
AMDQ	*authorised MDQ or AMDQ credits*
APC	*administered price cap*

BoD	Beginning of Day
DFPC	A Directional Flow Point Constraint applied to two or more points on a pipeline in accordance with clause 3.9.
DFS	Demand Forecast System, which is used for processing *Market Participant* forecasts, AEMO demand forecast overrides, and generating nodal demand forecasts as inputs for the MCE.
DTS	The *declared transmission system* in Victoria.
EoD	End of Day
LP	Linepack
MCE	Market Clearing Engine, optimisation software that determines *operating schedules* and *pricing schedules*.
MIBB	*market information bulletin board*
NFTC	Net Flow Transportation Constraint - A constraint applied to a group of injection/withdrawal meters at a common location to prevent the transportation capacity of the pipeline being exceeded.
NGL	National Gas Law
NGR or Rules	National Gas Rules
Qdiff	An Intra-day adjustment applied to *operating schedules and pricing schedules,* by AEMO clause in accordance with clause 3.11.
SCADA	A real time supervisory control and data acquisition system that processes data used in the management of the DTS.
SDPC	Supply Demand Point Constraint -A constraint applied to a *system point,* by AEMO in accordance with clause 3.8.
SMS	Short Message Service, which allows for the transmission of short text messages to and from digital mobile phones.
SWN	A System Wide Notice to individual *Market Participants*, all *Market Participants*, or any other relevant Participants.
TMM	A system used by AEMO in conjunction with the MCE to produce *operating schedules* and *pricing schedules*.

Table 2: Acronyms Definitions

Chapter 1 Preliminary

1.1 Introduction

a) These Wholesale Market Gas Scheduling Procedures (Victoria) ~~(**Procedure**)~~ (**Procedures**) are made in accordance with section 91BL of the National Gas Law.

~~b) This Procedure commences operation on 1 May 2012.~~

~~c)~~b) These~~is~~ Procedures may only be remade in accordance with Part 15B of the NGR.

~~d)~~c) If there is any inconsistency between these~~is~~ Procedures and the NGR, the NGR will prevail to the extent of that inconsistency.

1.2 Purpose

The purpose of these~~is~~ Procedures is to govern the operation of the declared wholesale gas market.

1.3 Application

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

1.4 Legal and Regulatory Framework

These~~is~~ Procedures ha~~s~~ve been made under section 91BL of the National Gas Law.

These Procedures also address AEMO's actions in the context of *emergencies*. Section 53 of the National Gas (Victoria) Act 2008 requires AEMO to publish a 'gas emergency protocol'. AEMO has published the Gas Emergency Protocol in compliance with that requirement. Additionally, the Minister may issue directions to AEMO in respect of the Gas Emergency Protocol or its operation under section 54.

Finally, the Minister has powers under Part 9 of the Gas Industry Act 2001 to proclaim that a shortage of gas supply exists and exercise certain powers, including direct AEMO in the circumstances.

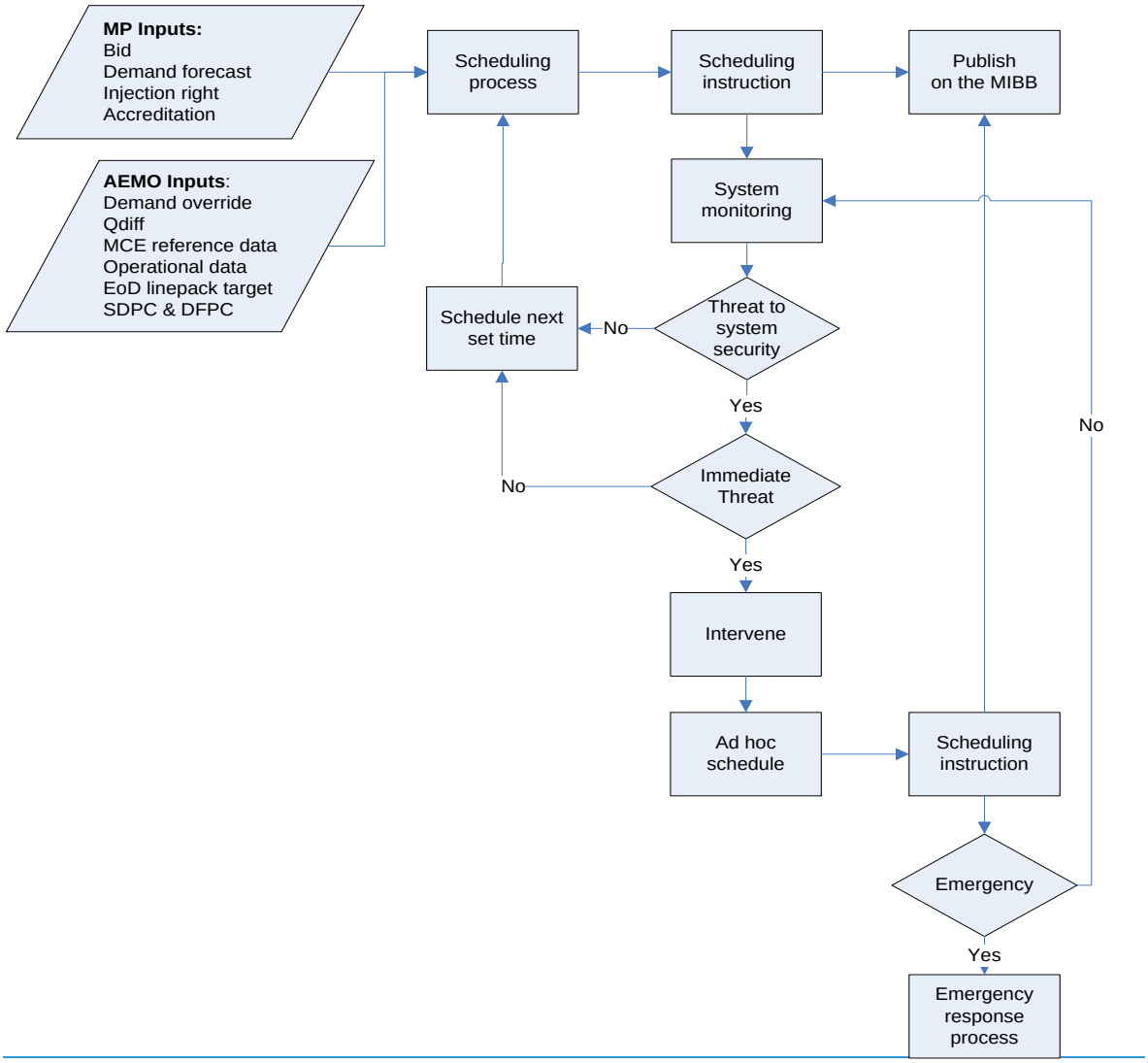
1.5 Related Policies and Procedures

- Wholesale Market Accreditation Procedures (Victoria)
- Wholesale Market Administered Pricing Procedures (Victoria)
- Wholesale Market Ancillary Payment Procedures (Victoria)
- Wholesale Market Electronic Communication Procedures (Victoria)
- Wholesale Market System Security Procedures (Victoria)
- Wholesale Market Uplift Payment Procedures (Victoria)
- Gas Quality Guidelines
- Gas Emergency Protocol

Chapter 2 General

2.1 Document and Process Overview

Figure 1 ~~below~~ depicts the process for *scheduling* by AEMO.



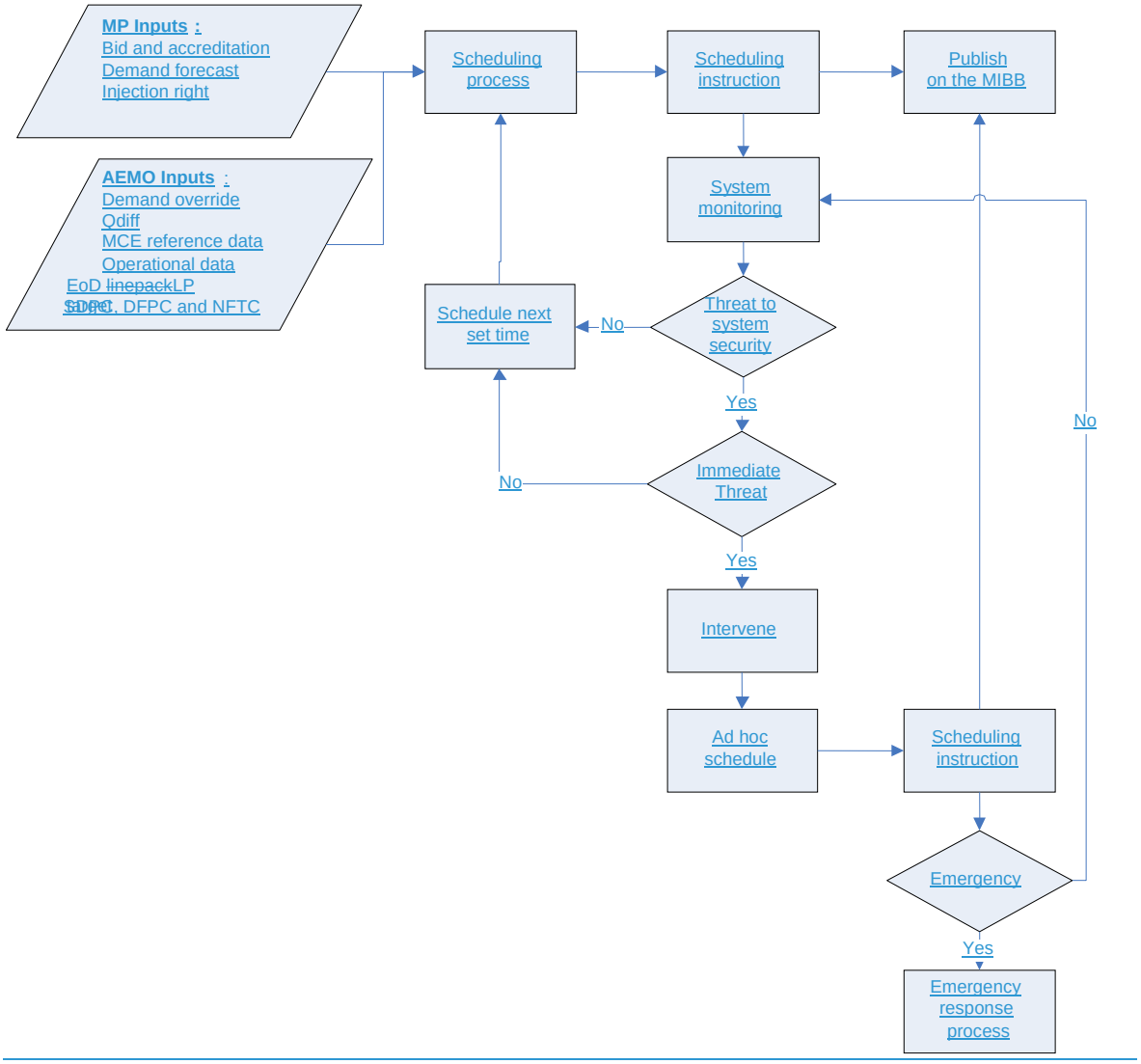


Figure 1: Scheduling Process

2.2 *Scheduling Instructions*

AEMO will issue *scheduling instructions* to Market Participants, and, in the case of the scheduling of *LNG injection bid*s, the *declared LNG storage provider*. The issued *scheduling instructions* will specify the quantities of *gas* which each *Market Participant* is required, in accordance with the Rules, to inject or withdraw in each hour of the *gas day*.

The *scheduling instructions* will normally be issued using the *operating schedule* published on the ~~*market information bulletin board (*~~MIBB~~)~~ (refer to Chapter 7). However, if AEMO is unable to *publish* an *operating schedule* or *Market Participants* are unable to access the MIBB to retrieve their *scheduled injections* or *scheduled withdrawals*, AEMO may issue *scheduling instructions* to *Market Participants* or the *declared LNG storage provider* by telephone, followed up with a fax or email confirmation of the instructions.

2.3 Objectives

AEMO will, to the extent practicable, attempt to satisfy the following objectives when issuing *scheduling instructions*:

(a) ensure that enough *gas* is made available for withdrawal from the ~~declared transmission system~~DTS during each *gas day* to satisfy withdrawal and ~~linepack~~ LP requirements;

(b) operate the ~~declared transmission system~~DTS within the *system security procedures* and avert or minimise threats to *system security*; and

(c) minimise the cost of satisfying demand for *gas*, taking into account:

(i) *operating schedules*;

(ii) *injection bids* and *withdrawal bids* by *Market Participants*;

(iii) any operational agreements, including operating agreements for interconnecting pipelines and the *service envelope agreement*;

(iv) information from the accreditation of *controllable quantities* of injections and withdrawals for individual *Market Participants* and locations where more than one *Market Participant* injects or withdraws *gas* through a common *connection point* or *meter*;

(v) plant or facility outages;

(vi) maintenance of the ~~declared transmission system~~DTS;

(vii) *system injection point* constraints, *system withdrawal point* constraints, and DFPC;

(viii) ~~declared transmission system~~DTS constraints;

(ix) any direction under the Gas Industry Act 2001 (Vic) or intervention by AEMO under the Rules;

(x) the practicality in compressor ramping up and down, time and the technical limitations and implications of starting and stopping compressors for short periods;

(xi) where *LNG* is scheduled to be vaporised ~~in the next hour~~:

- the time taken to start the vaporisation processes and implement it;
- the technical limitations and practicality in starting and stopping vaporisation over short periods; and
- the minimum practical rate of vaporising *LNG*; and

(xii) any other matter which AEMO reasonably considers is required to be taken into account to achieve the objectives of minimising the cost of satisfying demand and maintaining the security of the ~~declared transmission system~~DTS.

When issuing *scheduling instructions*, AEMO may adjust the inputs to or outputs from the *scheduling* process where it reasonably considers this is required to reflect operational practicalities.

All material factors which AEMO takes into account for the purposes of preparing an *operating schedule* will be recorded by AEMO so that the *gas scheduling procedures* can be properly audited.

Chapter 3 Inputs to *Scheduling*

Chapter 4 sets out the inputs and assumptions used by AEMO for the purposes of producing *operating schedules* and *pricing schedules* under normal operating conditions. This chapter provides more information about some of those inputs and assumptions.

3.1 AEMO demand forecasts and *demand forecast overrides*

AEMO determines its own *demand forecasts*.

Prior to producing an *operating schedule*, AEMO will compare its ~~*aggregate* demand forecast~~ with the ~~aggregate of *demand forecasts* by~~ *Market Participants'* aggregate *demand forecast* and may apply a *demand forecast override*.

A *demand forecast override* is an amount added or subtracted by AEMO to the *Market Participants'* ~~total~~aggregate *demand* ~~*forecasts*~~*forecast* for each hour so as to ensure that an appropriate amount of *gas* is *scheduled* for that *gas day* to maintain adequate ~~linepack~~ LP over the day and therefore maintain *system security*.

AEMO will apply a *demand forecast override* if:

(a) the ~~aggregate of *demand forecasts* by all~~ *Market Participants'* aggregate *demand forecast*, including any updated *demand forecasts* submitted by *Market Participants*, differ from AEMO's aggregate *demand forecast* by more than the amounts specified in the Demand Override Methodology; and

(b) AEMO reasonably considers that *scheduling* the ~~declared transmission system~~DTS without applying a *demand forecast override* creates an unacceptable risk of *curtailment*, threat to *system security*, or generates circumstances where a threat to *system security* may occur.

3.1A Demand Override Methodology

AEMO must prepare and publish a methodology setting out how it will determine and apply *demand forecast overrides*.

3.2 Compressor commitment

The commitment of compressors will depend on the following criteria:

- ~~A~~availability of compressors;
- *gas* demand for the *gas day*;
- injections and withdrawals at different locations;
- ~~beginning of day~~BoD ~~linepack~~LP;
- target ~~end of day~~EoD ~~linepack~~LP;
- expected injections and withdrawals by location; and
- total forecast demand for the following day.

AEMO will specify an initial commitment of required compressors as an input to the M~~arket~~ C~~learing~~ E~~ngine~~ for scheduling. The M~~arket~~ C~~learing~~ E~~ngine~~ optimises the operation of committed compressors by determining the required power output for each committed

compressor. Power output is constrained by the minimum and maximum operating limits of each compressor.

As far as practicable, AEMO will:

(a) assess the effect of the compressor commitment in the *operating schedule* on:

(i) *system security*, in accordance with the *system security procedures*;

(ii) compressor operations; and

(iii) locational (Nodal) prices in the *operating schedule*; and

(b) adjust compressor commitments to produce an *operating schedule* that:

(i) schedules pipeline pressures above minimum operating pressures and below maximum operating pressures, and in which all expected demand is satisfied, taking into account that the Market Clearing Engine alerts the operator to a non-feasible solution where any pipeline pressure is below the defined minimum operating pressure (refer to clause 3.5).

(ii) is feasible;

(iii) achieves a reasonable and practical balance between the starting and stopping of compressors over short time periods (i.e. 3 - 4 hours) and the objective of minimising the cost of satisfying demand over the day, taking into account that the Market Clearing Engine does not optimise the full costs and practicalities of starting and stopping compressors; and

(iv) reasonably satisfies the objective of minimising the cost of satisfying demand, taking into account the effects of compressor operations on locational (nodal) prices.

3.3 End of Day Linepack Target

The declared transmission systemDTS typically operates with a reasonably constant rate of hourly injections of *gas* from the main *system injection points*. The total hourly demand swings from levels below the injection rates during off peak periods to above the injection rates during peak periods. LinepackLP, which is the *gas* stored in the pipelines at any point in time, varies over the day, as it is the difference between the normally constant injection rate and the normally variable withdrawal rate accumulated over the day. A certain amount of linepack LP is required to maintain minimum system pressures, but gasLP beyond that level can be used as a source of supply for future hours.

AEMO's objective in setting end of dayEoD linepack LP targets is that there isto ensure sufficient *gas* in the pipelines at the end of each day so that:

- AEMO's reasonable expectation of the following day's demand will be met at all *system withdrawal points* and times during that *gas day*; and
- pressures will not fall below minimum, or rise above maximum, limits of operation during a *gas day*.

AEMO will set the end of dayEoD total system linepack LP target as the initial starting point when producing *operating schedules* and *pricing schedules*, and may also set end of dayEoD linepack LP targets for *system withdrawal zones* for operational reasons in an *operating schedule* when required. The Market Clearing Engine *schedules* an end of dayEoD linepack LP quantity in accordance with the target specified by AEMO for the system total in the *operating schedules* and *pricing schedules*.

AEMO will determine the ~~end of day~~EoD total system ~~linepack~~ LP target by balancing *system security* with market requirements according to the following inputs and criteria:

(a) minimum required ~~end of day~~EoD ~~linepack~~ LP level is maintained at all *system withdrawal points* and at all times during a *gas day*, especially in winter operation;

(b) use of system ~~linepack~~ LP capacity is maximised to cope with various operational scenarios in responding to *gas* market operation;

(c) sufficient ~~linepack~~ LP "head room" is retained for *demand forecast* error in order to prevent potential breaches of maximum operational pressures;

(d) appropriate compressor operation is achieved;

(e) injection and withdrawal rates at each *system injection point* or *system withdrawal point* (as relevant);

(f) the total demand level and demand profile, as affected by weather conditions and usage by large customers (e.g. gas fired generation demand);

(g) seasonal factors (i.e. time of year); and

(h) *system security*.

AEMO may change the ~~end of day~~EoD total system ~~linepack~~ LP target from time to time where it reasonably considers it is necessary to maintain efficient and safe system operational conditions. AEMO will notify *Market Participants* of any changes to ~~end of day~~EoD total system ~~linepack~~ LP target by an SWN ~~using SMS~~ in accordance with Chapter 7.

3.4 Operating data

Operating data is used by AEMO on the following ~~bases~~basis~~.~~:

(a) Nodal pressures are provided by AEMO~~'~~'s SCADA ~~system~~. This data is extrapolated to determine ~~initial~~ starting ~~linepack~~ conditions that AEMO applies to produce ~~*operating schedules* and *pricing schedules* for~~ the ~~then~~ current *gas day* initial and intra-day *operating schedules* and *pricing schedules*.

(b) Subject to paragraph (c), AEMO will use the metered *gas* quantities that the ~~Demand Forecasting System (~~DFS~~)~~ imports from SCADA to determine any ~~QDIFF~~Qdiff value to be applied when producing current *gas day* intra-day *operating schedules* and *pricing schedules* ~~for the current *gas day*~~.

(c) AEMO may substitute data for the purpose of producing *operating schedules* and *pricing schedules* when any SCADA data is not accurate or not available during any *gas day*, due to either communication or hardware problems~~, or if a significant amount of SCADA data is not available~~.

3.5 Market Clearing Engine reference data

The M~~arket~~ C~~learing~~ E~~ngine~~ models the ~~declared transmission system~~DTS using M~~arket~~ C~~learing~~ E~~ngine~~ reference data, which comprises Node configuration, *system withdrawal zones*, pipe segments, ~~linepack~~ LP zones, compressor characteristics and the MCE Factors. This data is necessary for the M~~arket~~ C~~learing~~ E~~ngine~~ to be able to produce Feasible Operating Schedules~~, that are physically feasible and achievable within system operating limits, whilst reflecting the actual operation of the declared transmission system.~~

AEMO will:

(a) *publish* the details of the current M~~arket~~ C~~learing~~ E~~ngine~~ reference data on the MIBB;

(b) apply an appropriate change management process to make any changes to M~~arket~~ C~~learing~~ E~~ngine~~ reference data. Reasons for change may include system operation requirements, alterations to the physical system or variations to the MCE Factors; and

(c) notify *Market Participants* by SWN ~~using SMS~~ in accordance with Chapter 7 of any significant changes made to M~~arket~~ C~~learing~~ E~~ngine~~ reference data, such as adding or removing *system withdrawal zones*, ~~linepack~~ LP zones, pipe segments, compressor stations or changes to the MCE Factors.

3.6 *Market Participant* data

Market Participants must communicate their intentions to inject *gas* into or withdraw *gas* from the ~~declared transmission system~~DTS each day in accordance with the Wholesale Market Electronic Communications Procedures.~~*electronic communication procedures.*~~

3.6.1 Market Participants Bids

Market Participants must submit *bids* in accordance with the Rules and the Wholesale Market Electronic Communications Procedures. ~~*electronic communication procedures.*~~

Market Participants may:

- make *bids* applicable for a specified date-time period (such as a single day or span many days); and
- update *bids* any time up to the cut-off times specified in the Rules.

If a *Market Participant* submission is invalid, AEMO will not use that ~~*Market Participant*~~ submission for *scheduling* and, as soon as practicable after it becomes aware of the invalidity, AEMO will notify the *Market Participant* ~~by an SWN using SMS in accordance with Chapter 7.~~ in accordance with the Wholesale Market Electronic Communications Procedures.

Each *bid* that is valid will be:

- date-time stamped;
- assigned a unique identifier; and
- stored in AEMO's database for audit purposes.

~~*Market Participants* may revise their *bids* up to the cut-off time (for example, for inclusion in the updated *operating schedule* to be published at 2:00 pm, the updated *demand forecast* or *bid* must be submitted by 1:00 pm).~~ An updated *bid* must be for the whole of the *gas day*, and must be consistent with the quantity scheduled in respect of that *bid* for the current and preceding *scheduling intervals* on that *gas day*.

3.6.2 Market Participants Demand Forecasts

Market Participants must submit *demand forecast*s in accordance with the Rules and the *electronic communication procedures*.

Demand forecasts may be updated by *Market Participants* at any time up to the times specified in the Rules.

When producing schedules, AEMO will use the most recent valid ~~apply validated revisions to~~ *Market Participants' demand forecasts* for the first hour of the relevant *scheduling horizon* until the end of the *gas day*.

~~Each *Market Participant* responsible for the procurement of pipeline commissioning *gas* for filling a new or recommissioned transmission pipeline must provide a *system withdrawal point* specific *demand forecast* for the required pipeline commissioning *gas*.~~

Market Participants may provide AEMO with a validation threshold against which *demand forecasts* by the *Market Participant* will be verified. If a validation threshold has been provided by a *Market Participant*, any *demand forecast* that exceeds the validation threshold provided by the *Market Participant* will be invalid.

AEMO may apply a *demand forecast override* in accordance with clause 3.1.

3.6.3 Market Participant Hedge Nominations Information

At any time up to the ~~beginning of day~~BoD cut-off time prior to the commencement of the *gas day*, *Market Participants* may submit *injection hedge nominations*, *agency injection hedge nominations*, and AMDQ nominations for the purpose of determining *Market Participants'* injection rights and *AMIQ* in accordance with the Rules.

The hedge nomination information includes:

(a) *injection hedge nominations*;

(b) *agency injection hedge nominations*;

(c) AMDQ nominations; and

(d) *AMIQ profile* (as a percentage) for each of the *scheduling intervals* of the *gas day*.

Market participants ~~are not able to~~ cannot modify *injection hedge nomination* and *agency injection hedge nomination* for the current *gas day* after the cut-off time for the ~~beginning of day~~BoD schedule for the current *gas day*.

Market Participants may submit an updated *AMIQ profile* for the current *gas day* before the cut-off time for each *scheduling horizon*. An updated *AMIQ profile* must incorporate the *AMIQ profile* most recently nominated for the current and the preceding *scheduling intervals* of the *gas day*.

Market Participants may submit an updated AMDQ nomination to a *system injection point* for the current *gas day* before the cut-off time for each *scheduling horizon,* which must be greater than or equal to the lesser of:

(a) the current nomination of *authorised MDQ* or *AMDQ credit*, whichever is relevant, to that *system injection point*; and

(b) the total quantity of *gas* scheduled for injection at that *system injection point* by that *Market Participant* for the current and preceding *scheduling intervals* of the *gas day*.

3.7 Nodal Demand Allocation

AEMO will *allocate* the aggregated *Market Participant demand forecasts* and any AEMO *demand forecast override* to each Node according to a base-load to heating-load split determined by AEMO for that Node. This split may be updated by AEMO from time to time.

3.8 Supply and Demand Point Constraints

~~AEMO may apply an SDPC to reflect contractual, physical and operating constraints at *system injection points* and *system withdrawal points* that are to be taken into account during the preparation of an *operating schedule*. AEMO may also apply SDPCs during~~

~~plant commissioning or pipeline maintenance (e.g. maintenance of compressors) to achieve physically feasible *operating schedules*.~~

AEMO may apply SDPCs to reflect contractual, physical and operating constraints for facilities that are external to the DTS to *system injection points* and *system withdrawal points*. These are applied to both *pricing schedules* and *operating schedules*.

AEMO may also apply SDPCs to restrict injections or withdrawals which would exceed the physical capacity of the DTS including pipeline capacity, pipeline facility commissioning, and maintenance (e.g. maintenance of compressors) or to avert threats to *system security*. An SDPC that is used due to a limitation within the DTS are applied to *operating schedules* only and not to *pricing schedules*.

SDPCs consist of:

- *supply point* constraints, which usually apply to the aggregate schedules on all *Market Participants* injecting *gas* at a particular *meter*;
- *supply point* constraints which selectively constrain *injection bids* at *system injection points* where the facility operator has registered multiple supply sources in accordance with clause 3.8A and *Market Participants* have accredited multiple supply sources in accordance with clause 3.10; and
- demand point constraints, which usually apply to the aggregate schedules on all *Market Participants* withdrawing *gas* at a single off-take *meter*.

~~The two important roles of SDPCs are:~~

~~(a) to enable the Market Clearing Engine to reasonably represent the planned and the actual total injection or withdrawal of *gas* during the day *from a system injection point* or *system withdrawal point*, where one or more *Market Participants* are involved in contracting the *gas* for injection or withdrawal. This will allow AEMO to produce an *operating schedule* that is representative of the planned and the actual total injection or withdrawal of *gas* from all *Market Participants* that are injecting or withdrawing at the *system injection point* or *system withdrawal point*; and~~

~~(b) to provide a facility whereby AEMO is able to prescribe an overriding set of constraints upon the collective *bids* at a *system injection point* or *system withdrawal point* (or selective *bids* at a *system injection point*). In this way, AEMO can reflect constraints at *system injection points* or *system withdrawal points* according to the operating arrangements, applicable to the *gas day*. If needed, this facility also allows AEMO to intervene in the market and drive the *operating schedule* during emergencies or at times of system constraint.~~

~~AEMO~~When AEMO applies an SDPC to reflect the limitations of a connected facility, it will set the SDPC parameters at an injection or withdrawal *meter* according to information supplied by ~~*Producers*, *interconnected transmission pipeline service providers* and *Storage Providers*~~the Facility Operator, either from the terms and conditions specified in operating agreements, which are entered into between AEMO and the associated party that is injecting or withdrawing; or using information provided by such party. This information will be used to set the overall limits for the *system injection points* or *system withdrawal points* specified in the information provided, to ensure any *scheduling instruction* issued by AEMO is consistent with injection or withdrawal capabilities of the *system injection point* or *system withdrawal point* for the period that the SDPC applies. The ~~SDPCs~~SDPC parameters include~~, but are not limited to~~:

- daily minimum quantity;

- daily maximum quantity;
- hourly minimum quantity;
- hourly maximum quantity;
- hourly ramp up/down limits;
- hourly response time;
- flexible response; and
- point expiration time.

AEMO may apply and change SDPCs independently ~~of information provided by *Market Participants*~~ during the *gas day* where AEMO becomes aware of changes in the physical capabilities of a ~~supply source~~*system injection point* or *system withdrawal point* that may constrain that ~~supply source and limit its ability to support *system security*~~.point.

~~Unless intervening in the market, AEMO will apply the appropriate SDPCs to both *operating schedules* and *pricing schedules*.~~

AEMO will notify Market Participants of changes to SDPCs by an SWN ~~using SMS~~ in accordance with Chapter 7.

3.8A Supply Source Outage at a System Injection Point ~~with multiple supply sources~~

In the event of an outage of a supply source at a *system injection point* for which the ~~facility operator~~Facility Operator has registered multiple supply sources~~,~~ in accordance with clause 3.~~8A~~9A, the ~~facility operator must~~Facility Operator may advise AEMO that they will cease to inject *gas* from that supply source into the DTS.

After receiving this advice, AEMO must:

- set the maximum hourly quantity ~~(MHQ)~~ to zero for *injection bids* at the failed supply ~~point~~ source from *Market Participants* who have accredited the failed supply ~~point~~ source as one of their multiple supply sources, in accordance with clause 3.~~10~~9; and
- notify *Market Participants* of the applied SDPC by an SWN ~~using SMS~~ in accordance with Chapter 7.

~~3.8A Registration of multiple supply sources~~

~~A facility operator may apply to register multiple supply sources at a SIP for the purpose of SDPC.~~

~~AEMO must register the multiple supply sources if the facility operator can demonstrate that appropriate arrangements are in place between the facility operator and the relevant *Market Participants* to allow the SDPCs to operate in accordance with clause 3.8.~~

3.8B Directional Flow Point Constraints

A special case of the SDPC, ~~called~~ a ~~Directional Flow Point Constraint (~~DFPC~~)~~, allows ~~two or more points on a pipeline (typically at the same location)~~ an injection and withdrawal *meter* to be ~~combined~~ paired so that the net flow is subject to a new set of constraints. The feature of the M~~arket~~ C~~learing~~ E~~ngine~~ is also capable of specifying different maximum flow limits depending on the net direction of flow.

Maximum hourly and maximum daily constraints can be specified in either or both flow directions and are applied on both the *operating schedule* and the *pricing schedule*.

This feature of M~~arket~~ C~~learing~~ E~~ngine~~ allows for financial flows to be maximised in either or both directions subject to physical limits specified in either operating agreements or operational conditions on the day.

The ~~DFPCs~~DFPC parameters are:

- maximum hourly net injection quantities: describing the maximum net amount of *gas* that can be injected in an hour;
- maximum hourly net withdrawal quantities: describing the maximum net amount of *gas* that can be withdrawn in an hour;
- maximum daily net injection quantities: describing the maximum net amount of *gas* that can be injected over a day; and
- maximum daily net withdrawal quantities: describing the maximum net amount of *gas* that can be withdrawn over a day.

AEMO may apply and change DFPCs to both *operating schedules* and *pricing schedules* during the *gas day* where AEMO reasonably considers that it is needed to reflect the circumstances applicable at the relevant *system injection points* and *system withdrawal points*. AEMO will notify *Market Participants* of any changes to DFPCs by an SWN ~~using SMS~~ in accordance with Chapter 7.

3.8B.1 Financial Flows during Plant Outages

Where there is a complete outage ~~for~~of a facility, AEMO will not *schedule* any injections or withdrawals to take place at the relevant *system injection points* or *system withdrawal points* (even where net gas flows at the points would be zero).

3.9 Net Flow Transportation Constraints

A NFTC allows multiple injection and withdrawal meters at a common location to be combined so that the net aggregate flow is constrained to reflect the physical DTS capacity (e.g. pipeline capacity).

The NFTC parameters are:

- maximum hourly net injection quantities: describing the maximum net amount of *gas* that can be injected in an hour;
- maximum hourly net withdrawal quantities: describing the maximum net amount of *gas* that can be withdrawn in an hour;
- maximum daily net injection quantities: describing the maximum net amount of *gas* that can be injected over a day; and
- maximum daily net withdrawal quantities: describing the maximum net amount of *gas* that can be withdrawn over a day.

AEMO must apply NFTCs to *operating schedules* only. AEMO may apply NFTCs during the *gas day* where combined *scheduled* net flows at a common location would otherwise exceed either the maximum daily or maximum hourly transportation capacity of the pipeline. AEMO will notify *Market Participants* of any changes to NFTCs by an SWN in accordance with Chapter 7.

~~3.9~~3.10 Accreditation of Controllable Quantities (Bids)

Under rule 210(1) of the Rules, AEMO and the *Market Participants* must comply with the *accreditation procedures* for the accreditation of quantities.

Market Participants who wish to be eligible to receive *ancillary payments* arising from the lodgement of their *injection bids* and *withdrawal bids* of a *controllable quantity* must provide information on any constraints applicable to the deliverability of *gas* for their injections or withdrawals through the accreditation process (refer to clause 3.8).

AEMO will record any accredited set of constraints for a *Market Participant's bids* at a *meter*. AEMO will only apply accredited constraints as inputs to the M~~arket C~~learing E~~ngine~~ and such accredited constraints will be applied to both the *operating schedule* and the *pricing schedule* unless AEMO reasonably determines that the accreditation data is the cause of an infeasible *operating schedule* or *pricing schedule.*

If AEMO identifies that *bid* data that has passed validation is causing an *operating schedule* or *pricing schedule* to be infeasible, AEMO may amend intraday the accredited quantities of the relevant *Market Participant*, as described further in clause 5.4. AEMO will notify the affected *Market Participant* of any such actions undertaken by AEMO.

Accreditation quantities for a *Market Participant* may include those shown in Table ~~2~~3 below:

Accredited quantities for *injection bids*	Accredited quantities for *withdrawal bids*
• Hourly ramp rates (up and down) • Minimum hourly flow • Maximum hourly flow • Hourly response time • *Bid* expiration time • Fixed schedule quantities (schedule restriction) • Flexible response • Nominated multiple supply source for SDPC	• Hourly ramp rates (up and down) • Maximum hourly flow • Hourly response time • *Bid* expiration time • Fixed schedule quantities (schedule restriction) • Flexible response

Table ~~2~~3: Accreditation quantities

3.10~~8~~A Registration of multiple supply sources

A facility operator may apply to register multiple supply sources at a *system injection point* ~~SIP~~ for the purpose of reflecting an outage of a supply source at that *system injection point*.~~SDPC.~~

AEMO must register the multiple supply sources if the ~~facility operator~~Facility Operator can demonstrate that appropriate arrangements are in place between the facility operator and the relevant *Market Participants* to allow the SDPCs to operate in accordance with clause 3.8A.

~~3.10~~3.11 Intra-day Adjustments for Injections or Withdrawals of Controllable Quantities (Qdiff)

Gas suppliers typically operate under contracts that commit them to deliver into the ~~declared transmission system~~DTS a quantity of *gas* over the *gas day*. These suppliers may over-inject later in the day if they under-inject ~~.~~in the first part of the day, so as to meet contractual amounts for daily deliveries. The same applies on the withdrawal side, for example, at interconnected pipelines.

AEMO may ~~apply~~ make an intra-day adjustment (called ~~QDIFF~~Qdiff) when producing *operating schedules* and *pricing schedules*. This is to recognise that the ~~party~~Facility Operator injecting or withdrawing *gas* at a *system point* ~~will~~is expected to make up any ~~shortfall~~difference (of scheduled versus actual) ~~over the day~~ at the time of reschedule and that there is no need to *schedule* additional (or less) *gas* as a result of the deviation from the *operating schedule*. ~~QDIFF~~Qdiff, therefore, accounts for ~~linepack~~ LP deviations arising from intraday behaviour of suppliers and minimises the cost of satisfying the demand over the day by avoiding the need for unnecessary injections of higher priced *gas*.

~~However, large *deviations* invariably deplete linepack reserve which may require additional peak shaving *gas* to be injected to maintain *system security* and avoid any threat to *system security*. The application of QDIFF is therefore limited by *system security* considerations.~~

~~The QDIFF~~The Qdiff intra-day adjustment is not associated with any individual *operating schedule* or *pricing schedule* and will only be applied to *system injection points* or *system withdrawal points* by AEMO after taking into account advice received by the relevant ~~facility operator~~Facility Operator.

~~3.11~~3.12 Initial Conditions

AEMO will assess the state of the ~~gas~~~~declared transmission system~~DTS as it expects it will be at the start of the ~~period~~ horizon being scheduled, taking into account:

(a) the initial pressures at all Nodes to apply at the start of the horizon being scheduled ~~or reschedule~~. This information effectively defines the initial ~~linepack~~ LP levels in each pipeline represented in the *operating schedule*, and the aggregated initial ~~linepack~~ LP used in the *pricing schedule*; and

(b) initial injection and withdrawal rates at the start of the horizon being scheduled and subject to accreditation (refer to clause 3.10).

AEMO will apply the following when producing an *operating schedule* and *pricing schedule*:

(i) ~~beginning of day~~BoD injection and withdrawal rates are to be based on the end conditions of the last approved *operating schedule* of the previous day, except where alternative starting conditions have been accredited (refer clause 3.10); and

(ii) reschedule injection and withdrawal rates are to be based on the conditions at the end of the preceding hour in the last approved *operating schedule*.

Chapter 4 Scheduling – Normal State

4.1 Operating Schedules

Operating schedules will be produced by AEMO for the current *gas day* and the *gas days* one day ahead and two days ahead, at the *standard schedule times* in accordance with the Rules.

4.1.1 ~~A~~Inputs

Inputs to *operating schedules* will include:

(a) data provided by *Market Participants*, including:

- *demand forecasts* (refer to clause 3.6);
- *injection bids* and *withdrawal bids* (refer to clause 3.6);
- any conditions or constraints included in the accreditation of *controllable quantities* (refer to clause 3.10); and
- AMDQ, AMDQ nominations, *injection hedge nominations*, and *agency injection hedge nominations* (refer to clause 3.6);

(b) information on physical deliverability requirements from operating agreements for locations where more than one *Market Participant* is injecting or withdrawing *gas* at a common point, SDPCs and DFPCs (refer to clauses 3.8 and 3.~~9~~8B);

(c) constraints on the physical capacity of the DTS, including SDPCs and NFTCs (refer to clauses 3.8 and 3.9);

~~(c)~~(d) AEMO's *demand forecast override* (refer to clause 3.1);

~~(d)~~(e) AEMO's nodal demand *allocation* (refer to clause 3.7);

~~(e)~~(f) physical pipeline constraints including a model of the physical *gas* pipeline or other physical *gas* system components such as the commitment of compressors (~~i.e. number of compressors running) (~~refer to clause 3.2);

~~(f)~~(g) ~~end of day~~EoD ~~linepack~~ LP target (refer to clause 3.3);

~~(g)~~(h) M~~arket~~ C~~learing~~ E~~ngine~~ reference data (refer to clause 3.5);

~~(h)~~(i) intra-day adjustments for injections or withdrawals of *controllable quantities* (refer to clause 3.11);

~~(i)~~(j) initial conditions (refer to clause 3.12); and

~~(j)~~(k) any other input or assumption that AEMO reasonably considers is required to produce an *operating schedule* in accordance with the objectives of minimising the cost of satisfying demand and maintaining ~~*the*~~ *system security*~~ of the declared transmission system~~

4.1.2 Review Process

AEMO will review *operating schedules* prior to *publication* to assess:

(a) whether ~~the *operating schedule*~~it is a Feasible Operating Schedule ~~and appropriate for operation of the declared transmission system~~DTS ~~within the *system security procedures*~~, taking into account:

- whether the Nodal pressures are within the normal operational pressure range ~~defined bounds~~;
- whether the ~~end of day~~EoD ~~linepack~~ LP is sufficient to allow the *scheduled injections* to satisfy the ~~forecast~~ *demand forecast* tomorrow within the requirements of the *system security procedures*; and
- whether the availability of *LNG* stock is sufficient to support the *LNG* scheduled; and

(b) the efficiency of the *operating schedule* in terms of minimising the cost of satisfying demand, taking into account:

- whether the Nodal prices are stable over the course of the day (as improving the stability of Nodal prices at Nodes across the day usually also improves the economic efficiency delivered by the resultant *operating schedule*);
- whether any Nodal prices are at *VoLL* (as *VoLL* will result in *curtailment* that may possibly be avoided e.g. ~~through more compression power or lower end of day linepack targets~~through an increased compressor commitment);
- whether any Nodal prices are negative (as negative prices are caused by an over-supply of *gas* ~~which may~~that could, for example, be caused from too much compressor commitment); and
- ~~end of day~~EoD ~~linepack~~ LP targets and compressor operations (as these may have an adverse effect on ~~N~~nodal prices, and thence efficiency, or may give rise to *ancillary payments*~~, if unsuitable~~).

Prior to *publication*, AEMO may, if time permits, adjust ~~operator~~ the AEMO inputs ~~as defined in~~referred to in clause 4.1.1, including *demand forecast overrides*, compressor commitments and ~~end of day linepack targets~~constraints (as required), and amend the *operating schedule* to minimise the cost of ~~attempt to improve its performance in~~ meeting market, operational and *system security* objectives.

The last *published operating schedule* constitutes AEMO's issued *scheduling instructions* at the time to all *Market Participants* and Facility Operators~~applicable persons~~.

The review process is set out in Table ~~3~~4 ~~below~~.

If after checking, the *operational schedule* is:	and:	then:
infeasible	there is sufficient time	1. adjust input data; 2. re-run *operating schedule*; and 3. if needed, repeat these steps until the *operating schedule* is feasible.
	there is insufficient time	Refer to clause 5.4
feasible		1. review the efficiency of the *operating schedule* in accordance with ~~this~~ clause 4.1; 2. if AEMO reasonably considers it will improve efficiency in the resultant *operating schedule*, adjust compressor commitments and ~~end of day linepack and~~ re-run the *operating schedule*; and 3. if needed, repeat these steps whilst time ~~remains~~permits.

Table ~~3~~4: Schedule Review Process

4.2 Pricing Schedules

The *pricing schedule* determines the *market price*. The *market price* applies to all locations for the *scheduling horizon*. AEMO will publish *pricing schedules* for current day, one day ahead, and two day ahead *gas days* and amendments to those *pricing schedules* by the times provided in the Rules.

The *pricing schedule* will not ~~normally~~ be updated where AEMO *publishes* an ad hoc *operating schedule* between the *standard schedule times* ~~for *system security* purposes~~. For the avoidance of doubt, *market price* is not revised for ad hoc *operating schedules*.

The *pricing schedule* produces a *schedule* of the *gas* injections and withdrawals at each Node per hour. An important characteristic of the *pricing schedule* is that it does not contain a model of the ~~physical *gas* pipeline~~DTS or other physical *gas* system components. The *pricing schedule* is, therefore, an ideal schedule where the ~~*gas* system~~DTS is represented as an infinite tank~~. However, the *pricing schedule* does~~ that takes into account *Market Participant bids* and *demand forecasts*, accreditations of *controllable quantities*~~accredited constraint information~~, SDPCs and DFPCs.

4.2.1 Inputs

Inputs to *pricing schedules* include:

(a) data provided by *Market Participants*, including:

- *demand forecasts* (refer to clause 3.6);
- *injection bids* and *withdrawal bids* (refer to clause 3.6);
- any conditions or constraints included in the accreditation of *controllable quantities* (refer to clause 3.10);

- AMDQ, AMDQ nominations, *injection hedge nominations*, and *agency injection hedge nominations* (refer to clause 3.6);

(b) ~~information~~constraints on physical deliverability requirements from operating agreements for locations where more than one *Market Participant* is injecting or withdrawing *gas* at a common *system injection point* or *system withdrawal point*, SDPCs, and DFPCs (refer to clause 3.8 and 3.~~9~~8B);

(c) AEMO's *demand forecast override* (refer to clause 3.1);

(d) AEMO's Nodal demand *allocation* (refer to clause 3.7);

(e) ~~end of day~~EoD ~~linepack~~ LP target (refer to clause 3.3);

(f) M~~arket~~ C~~learing~~ E~~ngine~~ reference data~~, except for pipeline network parameters~~ (refer to clause 3.5);

(g) intra-day adjustments for injection or withdrawal of *controllable quantities* (refer to clause 3.11);

(h) initial conditions (refer to clause 3.12); and

(i) any other input or assumption that AEMO reasonably considers is required to produce a *schedule* in accordance with the objectives of minimising the cost of satisfying demand and maintaining ~~*the*~~ *system security*~~*. of the declared transmission system*~~

4.2.2 Review Process

AEMO will review *pricing schedules* prior to *publication* to assess whether:

- *Market price*, injections, controllable and uncontrollable withdrawals, and system ~~linepack~~ LP match expectations, taking into account:
  - ~~hedge nomination information;~~
  - information from accreditation of quantities;
  - SDPCs applied at *system injection points* and *system withdrawal points*;
  - DFPCs applied at bi-directional *system injection points/system withdrawal points*;
  - total *demand forecast*;
  - initial conditions; and
  - the ~~end of day~~EoD ~~linepack~~ LP target; and
- the *market price* is consistent with *bids* that were scheduled.

AEMO may publish a *market price* sensitivity report linked with various ~~forecast~~ *demand forecast* profiles. The profiles correspond to ±10% *deviation* from the forecast demand, which may change from time to time.

Chapter 5 Dealing with Abnormal Conditions

5.1 Plant or Facility Outages

AEMO will assess the *system security* impact of any plant outage ~~that occurs~~ and may amend relevant SDPCs and~~/or~~ DFPCs to reflect the outage in subsequent *operating schedules*.

If, in AEMO's reasonable consideration:

(a) a delay in rescheduling until the next *standard schedule time* may threaten *system security*, AEMO may *publish* an ad hoc *operating schedule* applying appropriate SDPCs and~~/or~~ DFPCs to reflect the outage; or

(b) a delay in rescheduling until the next *standard schedule time* is not likely to threaten *system security*, AEMO may amend relevant SDPCs and~~/or~~ DFPCs to reflect the outage and apply these in the schedules published at the next *standard schedule time*.

5.2 Ad hoc Operating Schedules

Where AEMO revises and *publishes* an *operating schedule* outside the *standard schedule times*, it is known as an ad hoc *operating schedule*. For the avoidance of doubt, late *publication* of an *operating schedule* is not an ad hoc *operating schedule* (refer to clause 5.4 ~~for further details~~).

Publishing an ad hoc *operating schedule* as the revised *scheduling instruction* is classified as an *intervention* under the Rules. ~~AEMO~~AEMO must declare a threat to *system security*~~-~~ prior to *publishing* an ad hoc *operating schedule*, and may only *publish* an ad hoc *operating schedule* due to a *system security* threat ~~as provided for in~~in accordance with rule 215(4) and rule 343~~ of the Rules~~.

~~The publication of an ad hoc *operating schedule* may resolve an emerging or current threat to *system security* and thereby avert the need for AEMO to declare a threat to *system security*.~~

AEMO will take into account various factors when considering the need for an ad hoc *operating schedule*, including:

- significant *demand forecast* increase due to unexpected cold weather ~~changes~~ or unexpected gas fired power generation;
- ~~significant *demand forecast* increase (e.g. for gas fired power generation);~~
- unexpected high demand prior to ~~and~~or during evening peak~~, which~~ that ~~leads to increase~~requires an increased rate of peak shaving *gas*, *LNG* vaporisation;
- ~~significant~~ loss of plant or facility; and
- other operational reasons, such as a tripped compressor, or *gas* quality considerations.

AEMO will notify *Market Participants* of the *publication* of any ad hoc *operating schedules* by ~~a~~an SWN ~~using SMS~~ in accordance with Chapter 7.

AEMO will not revise or update the applicable *pricing schedule* or *market price* when it publishes an ad hoc *operating schedule*. The *pricing schedule published* at the last *standard*

schedule time is not updated until the next *standard schedule time* regardless of any ad hoc *operating schedules published* during the *scheduling interval*. *Market price* only changes at the fixed times (*standard schedule times*) and ~~the market will rely on~~ *ancillary payments* ~~to~~will, as far as practicable, ~~address~~ apply ~~differences between *market price* and the resultant schedules~~ as a result of any ad hoc *operating schedule* or other forms of *intervention*.

5.3 Threats to System Security

5.3.1 Introduction

Figure 2 ~~below~~ depicts the process followed by AEMO in response to a threat to *system security*.

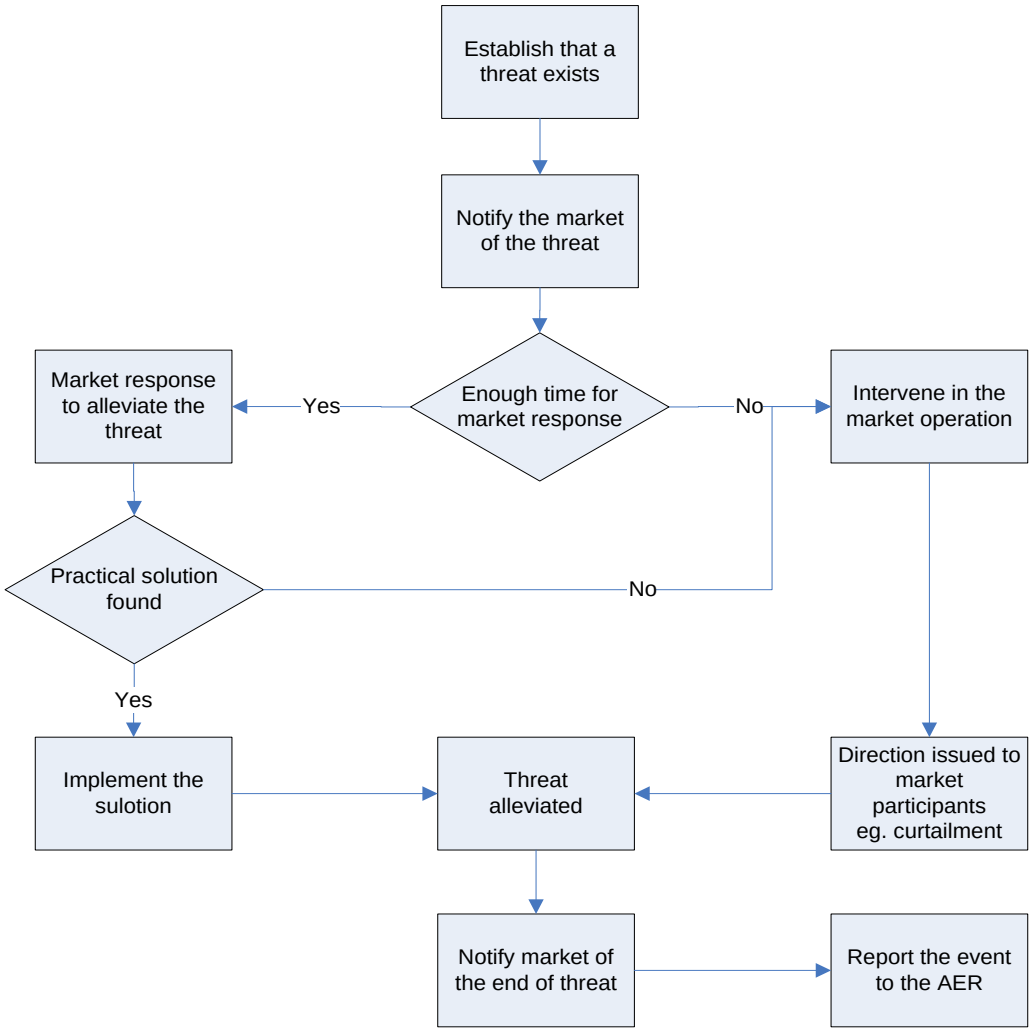


Figure 2: AEMO response to a threat to *system security*

Examples of events that may create a threat to *system security* include:

- *gas* demand exceeding ~~declared transmission system~~DTS capacity;
- a significant unforeseen increase in *gas* demand;
- *gas* supply sources incapable of meeting foreseen *gas* demand;
- a breakdown of the ~~declared transmission system~~DTS equipment such as compressors or *LNG* vaporisers;

- a transmission pipeline incident;
- a distribution incident that significantly affects injections into or withdrawals from the ~~declared transmission system~~DTS; or
- a *gas* supply ~~resource~~ incident, including *gas* quality excursions leading to off-specification *gas* ~~being~~ in the ~~declared transmission system~~DTS.

If, at any time, AEMO reasonably considers there is a likelihood that system pressures may fall outside the range of allowable system operating pressures ~~then, where~~ and time permits, AEMO will immediately establish if the threat can be alleviated by normal rescheduling or requires an ad hoc *operating schedule* under rule 215(4) of the Rules (see clause 5.2 ~~above~~).

Critical system operating pressures are detailed in the *system security procedures*.

Where time does not permit, or AEMO considers commercial market responses are inadequate, AEMO will intervene in the operation of the ~~*gas* *Market*~~ by ~~giving~~ issuing directions to *Market Participants* under rule 343 of the Rules.

AEMO may declare ~~a Level 5~~an ~~*E*~~*emergency* in accordance with the Gas ~~E~~emergency ~~P~~protocol where it reasonably considers this step to be required to assist it with directly co-ordinating and managing action to alleviate the threat to *system security*.

5.3.2 Notification of Threat to System Security

If AEMO believes that there is a threat to *system security* that cannot be alleviated through normal *scheduling* processes including the *publication* of ad hoc *operating schedules*, it will advise all *Market Participants* of:

- the nature and general magnitude of the threat;
- the estimated likely duration of the threat;
- the shortfall in *gas* supplies likely to occur during that period;
- ~~-~~the latest time AEMO will need to intervene in the operation of the *gas* market if the threat does not subside without intervention by AEMO; and
- the *system withdrawal zones* within the ~~declared transmission system~~DTS in which the threat to *system security* is, or is likely, to be located.

Notification will be made by an SWN ~~using SMS~~ in accordance with Chapter 7.

AEMO may, as part of the above notice or by separate subsequent notice, seek *Market Participant* advice regarding its best estimates of the following:

(a) whether the *Market Participant* is in a position to make additional injections or withdrawals of *gas* and whether the *Market Participant* would need to reschedule maintenance or other work in order to do so;

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

(c) ~~-~~whether the *Market Participant* is in a position to inject off-specification *gas* into the ~~declared transmission system~~DTS;

(d) ~~-~~the period of notice the *Market Participant* would require before making additional injections or withdrawals under paragraphs (a), (b) and (c); and

(e) the costs the *Market Participant* would incur in facilitating or implementing an injection or withdrawal under paragraphs (a), (b) and (c).

AEMO will~~,~~ as soon as practicable~~,~~ advise all *Market Participants* of any significant change in the information provided by an ~~SWM using SMS~~SWN in accordance with Chapter 7.

5.3.3 Notification of Return to Normal Operating Conditions

AEMO will advise all *Market Participants* immediately of the cessation of the threat to *system security* and the return to normal operating conditions when it reasonably considers that the threat to *system security* to be at an end.

This notification will be made by an SWN ~~using SMS~~ in accordance with Chapter 7.

5.3.4 Alleviation of a Threat through Market Response

It may be possible for *Market Participants* to assist in alleviating a threat to *system security* through changes to their *bids*.

If AEMO reasonably considers that a threat to *system security* will subside without *intervention*, AEMO will:

- advise those *Market Participants* that AEMO considers would be required to take ~~or refrain from~~ action if the threat to *system security* is not resolved without *intervention*, including *Market Participants* whose *bids* are likely to be *scheduled* in accordance with an ~~ad hoc~~ *operating schedule*, of the following information:
- ~~-~~the existence of the threat to *system security*; and
- the likely nature of any requirement ~~of AEMO~~ if AEMO determines that it should intervene; and
- keep all *Market Participants* informed with up-to-date information about the threat to *system security* and measures taken to avert the threat.

AEMO will provide the above advice by an SWN ~~using SMS~~ in accordance with Chapter 7. AEMO may also initiate further contact by telephone with *Market Participants* in order to encourage a market response to alleviate the threat to *system security*.

5.3.5 Alleviation of the Threat through AEMO Intervention

If AEMO reasonably considers that a threat to *system security* is unlikely to subside without *intervention*, AEMO will intervene in the *Market* by taking measures it believes are reasonable and necessary to overcome the threat to *system security*.

AEMO may, if it reasonably considers that the actions available to it under the *National Gas Law* and the *Rules* ~~may~~ might not be adequate to alleviate the threat, seek ~~Government~~ intervention by the Victorian government under the ~~applicable emergency powers~~Gas Industry Act 2001.

Without in any way limiting the actions available to AEMO, reasonable and necessary actions that AEMO may take include:

(a) *curtailment* in accordance with the ~~emergency *curtailment list*~~Gas Load Curtailment and Gas Rationing and Recovery Guidelines, subject to paragraph (b);

(b) ~~-~~increasing withdrawals;

(c) requiring *Market Participants* to use reasonable endeavours to inject available *gas* which is available and to which the *Market Participant* is entitled, but which has not been *bid* into the market on the relevant *gas day* or which is non-firm *gas*, recognising in the case of non-firm *gas* the uncertainties associated with the supply and injection of that *gas*;

(d) requiring any *Market Participant* to inject off-specification *gas* into the declared transmission systemDTS; and

(e) requiring *Market Participants* to do any reasonable act or thing that AEMO believes necessary in the circumstances.

AEMO may re-determine a new SDPC and apply it only to the *operating schedule* when it intervenes in the market if it reasonably considers that this is required to produce the required outcomes. In so doing, AEMO may apply an amended minimum hourly quantity by a SDPC to an *operating schedule* to schedule additional peak shaving *gas* (e.g. *LNG*) or any other *gas* supply for operational needs.

5.3.6 LNG Scheduled Out Of Merit Order for System Security Purposes during Standard Schedule Time

If LNG is *scheduled* out-of-merit-order as an operational response for *system security* purposes (i.e. peak shaving gas), AEMO will notify *Market Participants* by an SWN of low LP conditions as soon as possible after the first *operating schedule* incorporating operational response *LNG* is approved and will declare a threat to *system security* in accordance with rule 341.

AEMO will also notify *Market Participants* by an SWN when the LP condition changes or when *LNG* is no longer required to relieve the threat to *system security.*

5.3.65.3.7 Directions

Refer to the emergency protocolGas Emergency Protocols for the issue of directions and management of *emergencies*.

5.4 Scheduling in Abnormal Conditions

This section describes how AEMO will complete the scheduling process in circumstances where abnormal conditions exist. The approach taken by AEMO to scheduling infollowing are deemed to be Aabnormal Cconditions is set out in Tables 4 to 9 below, with the following sixeight conditions:

Condition 1	A reschedule is *required**Scheduling* to address plantfacility outages, facility interruptions/reductions, or supply deficiency
Condition 2	Unable to produce both the *pricing schedule* and *operating schedule* by the required *standard schedule time*
Condition 3	Unable to produce an *operating schedule* only (*pricing schedule* is okayvalid) by the required *standard schedule time*
Condition 4	Unable to approve either the *pricing schedule* or *operating schedule* by the required *standard schedule time*
Condition 5	Unable to *publish* either the approved *pricing schedule* or approved *operating schedule* by the required *standard schedule time*

Condition 6 ~~Need to produce or *publish*~~*Publish* an ad hoc *operating schedule* ~~when previous *operating schedule* is being used for current~~ due to potential threat to *system security*

Condition 7 *Market Participants* unable to submit scheduling input data by the required bid submission cut-off time

Condition 8 Unable to produce a Nodal demand

Unless stated otherwise, all conditions will apply only to current day and intra-day *pricing schedules* and *operating schedules* not Day+1 or Day+2 forecast schedules.

Condition 1 Scheduling to address ~~plant~~facility outages, ~~facility~~ interruptions~~/reductions~~, or supply deficiency

if due to:	~~then~~ AEMO will:	if this is not possible, or does not resolve matters:
~~plant outages~~ ~~or~~ facility outages, interruptions or supply deficiency ~~reductions~~	**if the conditions do not give rise to a threat to *system security*:** • ~~notify *Market Participants* as soon as possible~~ **~~if time permits:~~** • ~~o~~ adjust the AEMO ~~operator~~ inputs as defined in clause 4.1.1 and 4.2.1~~(including, but not limited to SPDC, end of day zonal linepack targets or compressor commitments) accordingly if~~ as required • ~~o re-~~run revised schedule **if revised *operating schedules* are feasible~~, then~~:** • ~~if needed, publish an ad hoc *operating schedule*~~ • ~~otherwise,~~ publish standard schedules at the next *scheduling interval* • notify *Market Participants* of the event and actions undertaken	**if time permits and further steps may resolve the matter:** • repeat process **~~if time does not permit or repeating unlikely to resolve:~~** • ~~intervene in the market and issue directions as required (refer to clauses 5.3.5 and 5.3.6)~~ ~~notify *Market Participants* of the event and actions undertaken~~

~~supply deficiency~~	**if the conditions give rise to a threat to *system security*:**
	• notify *Market Participants* of threat to *system security* as soon as possible
	if time permits:
	• ~~o~~ assess whether adjustment of ~~operator~~ AEMO inputs as defined in clause 4.1.1 and 4.2.1 ~~(including, but not limited to SPDC, end of day zonal linepack targets or compressor commitments)~~ may resolve the threat
	• ~~o~~ if so, adjust operator inputs accordingly
	• ~~o~~ re-schedule
	if revised *operating schedules* are feasible, then:
	• if ~~needed, publish an~~ ad hoc *operating schedule* is needed refer to Abnormal Condition 6
	• ~~otherwise, publish standard schedules at the next *scheduling interval*~~
	• notify *Market Participants* of the event and actions undertaken
		if time permits and further steps may resolve the matter:
		• repeat process
		if time does not permit or repeating unlikely to resolve:
		• intervene in the market and issue directions as required (refer to clauses 5.3.5 and 5.3.6)
		• notify *Market Participants* of the event and actions undertaken

~~Table 4: Scheduling abnormal condition 1~~

Condition 2 Unable to produce both the *pricing schedule* and *operating schedule* by the required *standard schedule time*

due to:	~~then~~ AEMO will:	if this is not possible or does not resolve matters:
bid data that AEMO is able to identify ~~and is~~as either corrupt, missing or otherwise causing the problem	• adjust the accreditation constraints applicable to the~~-~~ relevant *bid(s)* ~~to constrain out the information~~ that appear~~s~~ to be causing the problem • re-run the *operating schedule* and *pricing schedule* • notify the *Market Participant* involved of the issue ~~matter~~ and the steps undertaken	• re-approve the most recently approved *operating schedule* and *pricing schedules* as the updated schedules; • declare an *administered price period* and set the administered price flag (manual) • review the market price of the re-approved *pricing schedule* and if greater than the ~~*administered price cap* (~~APC~~)~~, manually cap at the APC ~~• after the event (by back- end process by support staff) set the start time equal to the *publish* time of these so that settlements systems will correctly determine results~~ • notify *Market Participants* of the event and actions undertaken

failure of M~~arket C~~~~learing~~ E~~ngine~~ or TMM or other related systems, including: • ~~loss of or~~ failure to transfer data to M~~arket C~~~~learing~~ E~~ngine~~/TMM from associated applications; or • corruption of data; or • any other ~~data~~ issues that prevent the solution of a Feasible Operating Schedule.	• re-approve the most recently approved *operating schedule* and *pricing schedule* as the updated schedules • declare an *administered price period* and set the administered price flag (manual) • review the market price of the re-approved *pricing schedule* and if greater than the APC, manually cap at the APC • ~~after the event (by back-end process by support staff) set the start time equal to the publish time of these schedules so that settlements systems will correctly determine results~~ • notify *Market Participants* of the event and actions undertaken	**if the conditions do not give rise to a threat to *system security*:** • continue to repeat process at the next standard schedule time. **if the conditions give rise to a threat to *system security*:** • intervene in the market and issue directions as required (refer to clauses 5.3.5 and 5.3.6) • notify *Market Participants* of the event and actions undertaken

~~Table 5: Scheduling abnormal condition 2~~

Condition 3 Unable to *produce* an *operating schedule* ~~only~~ (*pricing schedule* is ~~okay~~)valid) by the required *standard schedule time*

due to:	~~then~~ AEMO will:	if this is not possible or does not resolve matters:
Failure of M~~arket~~ C~~learing~~ E~~ngine~~ or TMM ~~or other related systems~~to produce a Feasible Operating Schedule, including: • ~~loss of or failure to transfer data to Market Clearing Engine/TMM from associated applications; or~~ • corruption of data; or • any other ~~data~~ issues (including input data) that prevent the solution of a Feasible Operating Schedule.	**if time permits:** • ~~adjust the network topology configuration~~ • ~~adjust operational data input~~ • assess whether adjustment of ~~operator~~AEMO inputs as referred to in clause 4.1.1 may resolve the issue and adjust accordingly • re-run *operating schedule* ~~from the basis of the *and pricing schedule* for the *scheduling horizon*~~with the adjusted inputs to achieve a Feasible Operating ~~*and pricing*~~ Schedules~~s~~ • repeat process if *operating schedule* is still not feasible and time permits	**If the *pricing schedule* is physically achievable within system operating limits, and can ~~feasible to~~ be used as the *operating schedule*:** • create the *operating schedule* from the *pricing schedule* (i.e. use the *pricing schedule* as the *operating schedule*) for the *scheduling horizon* • approve both *pricing schedule* and *operating schedule* **If the *pricing schedule* is not physically achievable within system operating limits, and ~~can~~cannot ~~feasible to~~ be used as the *operating schedule*:** • re-approve the most recently approved *operating schedule* and *pricing schedules* as the updated schedules • declare an *administered price period* and set the administered price flag (manual) • review the market price of the re-approved *pricing schedule* and if greater than the APC, manually cap at the APC • ~~after the event (by back- end process by support staff) set the start time equal to the publish time of these schedules so that settlements systems will correctly determine results~~

- notify *Market Participants* of the event and actions undertaken

~~Table 6: Scheduling abnormal condition 3~~

Condition 4 Unable to approve ~~either~~ the *pricing schedule* ~~or~~and *operating schedule* by the required *standard schedule time*

due to:	then AEMO will:	and:

Failure to approve *pricing schedule* and *operating schedule~~s~~* on time	• **If there is a Feasible Operating Schedule and Valid Pricing Schedule available ~~then~~ AEMO will:**
	  • approve the *operating schedule* and *pricing schedule~~;~~*
	  • declare an *administered price period* and set the administered price flag (manual);
	  • review the market price of the ~~re-~~approved *pricing schedule* and if greater than the APC, manually cap at the APC
	  • ~~after the event (by back- end process by support staff) set the start time equal to the *publish* time of these schedules so that settlements systems will correctly determine results; and~~
	  • notify *Market Participants* of the event and actions undertaken
		• No further action

- **If there is a ~~feasible~~ Valid Pricing Schedule but no Feasible Operating Schedule ~~then~~ AEMO will:**
  - create an *operating schedule* from the Valid ~~Feasible~~ Pricing Schedule
  - approve the *operating schedule* and *pricing schedule*
  - declare an *administered price period* and set the administered price flag (manual)
  - review the *market price* of the approved *pricing schedule* and if greater than the APC, manually cap at the APC
  - ~~after the event (by back- end process by support staff) set the start time equal to the *publish* time of these schedules so that settlements systems will correctly determine results; and~~
  - notify *Market Participants* of the event and actions undertaken

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- **If there is no Valid ~~feasible~~ Pricing Schedule and Feasible Operating Schedule ~~then~~ AEMO will:**
  - re-approve the most recently approved *operating schedule* and *pricing schedule* as the updated schedules
  - declare an *administered price period* and set the administered price flag (manual)
  - review the market price of the re-approved *pricing schedule* and if greater than the APC, manually cap at the APC
  - ~~after the event (by back -end process by support staff) set the start time equal to the publish time of these schedules so that settlements systems will correctly determine results; and~~
  - notify *Market Participants* of the event and actions undertaken

~~Table 7: Scheduling abnormal condition 4~~

Condition 5 Unable to *publish* either the approved *pricing schedule* ~~and/~~or approved *operating schedule* by the required *standard schedule time*:

due to:	~~then~~ AEMO will:	If not published in a reasonable timeframe: ~~and:~~
~~a very short temporary~~Short ~~d~~Delay in publication ~~by~~of either/both schedules on MIBB ~~or other communication systems. A short delay is one that is~~ anticipated to be ~~restored in a timely manner~~.	~~The~~**If the *pricing schedule* ~~and/~~or *operating schedule* is anticipated to be *published* in a timely manner~~in a reasonable time frame with only a short delay~~** • the approved, but unpublished, *pricing schedule* ~~and/~~or *operating schedule* continue to apply; • notify *Market Participants* of the expected late *publication* of schedule/s; and notify *Market Participants* of the actual *publication* time when ~~-~~the relevant *pricing schedule* ~~and/~~or *operating schedule* is *published* • ~~A short delay is one that is anticipated to be restored in a timely manner.~~	~~**If the *pricing schedule* or *operating schedule* is published in a reasonable time frame:**~~ ~~• No further action~~ ~~**If not published in a reasonable timeframe:**~~ ~~Revert to failure of MIBB and/or TMM~~ **If only the *operating schedule* ~~only~~ has not been or ~~/~~will not be *published* on time** • the *published pricing schedule* and the approved but unpublished *operating schedule* shall continue to apply; • advise *Market Participants* of their *operating schedules* until such time as the *operating schedule* is *published* on MIBB (if required) • notify *Market Participants* of the event and actions undertaken **If both the *operating schedule* and *pricing schedule* have not been or ~~s/~~will not be *published* on time:** • the approved but unpublished *pricing schedule* and *operating schedule* shall continue to apply; • declare an *administered price period*; and

		• set the administered price flag and manually set the administered price; • advise *Market Participants* of their operating schedules until such time as the operating schedule is published on the MIBB (if required) • notify *Market Participants* of the event and the *market price*
~~failure of TMM/MIBB or other systems, including communications to publish the approved schedule on MIBB and/or allow *Market Participants* to view published schedule~~	• ~~**If the *operating schedule* has not** been **published on time**, fax or email Market Participants their operating schedules until such time as the schedule is published on MIBB (if required)~~ ~~**If the *pricing schedule* has not** been **published on time:**~~ • ~~declare an *administered price period*; and~~ • ~~set the administered price flag and manually set the administered price and notify *Market Participants* of the market price by SWN~~ ~~Notify *Market Participants* of the event and actions undertaken~~	~~No further action~~

~~Table 8: Scheduling abnormal condition 5~~

Condition 6 ~~Need to produce or publish~~Publish an ad hoc *operating schedule* ~~when previous *operating schedule* is being used for current *scheduling horizon* but is not appropriate~~due to potential threat to *system security*

preceding steps:	**~~then~~ AEMO will:**	**if this is not possible or does not resolve matters:**
The most recently approved *operating schedule* ~~applies and is approved but~~ is no longer appropriate due to ~~potential or emerging~~a threat to *system security* that can be addressed with an ad hoc schedule.	• declare and notify of a threat to *system security* for an ad hoc schedule • produce an ad hoc *operating schedule* by: ~~o~~ applying the *Market Participant* bids and hedge information from the most recently approved *operating schedule* to the ad hoc *operating schedule* by ~~manually~~ setting the cut-off time to the one applicable in that previous schedule~~;~~ • ~~o~~ applying the most up~~ ~~to~~ ~~date *demand forecasts* by leaving the *demand forecast* time set to the cut-off time of the start of the current *scheduling horizon* schedule (not reset to earlier schedule)~~;~~ ~~o~~ adjusting operator inputs as required~~;~~ ~~o *re-running*~~*publish* the~~ ~~new *operating schedule* ~~(only);~~ if feasible~~;~~ or ~~apply~~produce an ad hoc *operating schedule* by copying an existing *operating schedule* for the *scheduling horizon*~~; or~~	**if the conditions ~~do not~~ give rise to a threat to *system security* that can be addressed with a further ad hoc schedule:** • repeat process • notify *Market Participants* of the event and actions undertaken **if the conditions give rise to a threat to *system security* that cannot be addressed with a new ad hoc *operating schedule*:** • intervene in the market and issue directions as required (refer to clauses 5.3.5 and 5.3.6) • notify *Market Participants* of the event and actions undertaken

- ~~override~~, overriding the scheduled quantities ~~in the *operating schedule*~~ appropriately~~;~~ and *publish* if feasible
- notify *Market Participants* ~~of the event and actions undertaken~~that an ad hoc schedule has been *published*

~~Table 9: Scheduling abnormal condition 6~~

Condition 7 *Market Participants* unable to submit scheduling input data by the required submission cut-off time

due to:	~~then~~ AEMO will:	and:
WebExchanger outage/failure for part/entirety of the submission window or other issue preventing *Market Participants* from submitting *scheduling* inputs	• notify *Market Participants* as soon as possible of the failure • produce standard schedules at the next *scheduling horizon* using the latest *Market Participant* submissions • notify *Market Participants* when WebExchanger returned to service	• No further action

Condition 8 Unable to produce a Nodal demand

due to:	~~then~~ AEMO will:	and:
AEMO is unable to produce a Nodal demand for the next *scheduling horizon*	• produce standard schedules at the next *scheduling horizon* using the latest available Nodal demand (this may be the previous horizons *Market Participant* demand forecasts and applicable AEMO demand override) • notify *Market Participants* of the event and actions undertaken	**if the conditions give rise to a threat to *system security* that can be addressed with an ad hoc *schedule*:** • produce an ad hoc *operating schedule* by following Condition 6: • notify *Market Participants* of the event and actions undertaken **if the conditions give rise to a threat to *system security* that cannot be addressed with an ad hoc schedule:** • *intervene* and issue directions as required (refer to clauses 5.3.5 and 5.3.6) • notify *Market Participants* of the event and actions undertaken • No further action

Chapter 6 Administered Prices

Refer to the *administered pricing procedures* ~~which~~ that specify the processes for determining administered pricing, including the ~~*administered price* cap~~APC and AEMO's processes for declaring the commencement of and end~~ing~~ of *administered price periods*.

Chapter 7 Market Notifications and Communications

Notifications and communication of market and system information between AEMO and *Market Participants* must be in accordance with the *electronic communication procedures*.

MIBB is the primary means by which AEMO and *Market Participants* communicate information required under these Procedures.

~~In the event that~~If the MIBB fails, AEMO and *Market Participants* must use the backup communication arrangements directed by AEMO to communicate the information required. ~~-~~The backup communication arrangements may include facsimile, telephone, or other means, as directed by AEMO at the time.

Notification by an SWN ~~using~~with follow up SMS ~~is a~~as the secondary means ~~of~~for ~~notifying or~~ communicating updates to *Market Participants* as required by these Procedures.

For the avoidance of doubt, ~~a scheduling error does not include~~ an error ~~in~~ or failure to notify *Market Participants* by SMS is not an *unintended scheduling* ~~*error*~~*result*.

An SWN with follow up SMS message may be used to notify *Market Participants* of any of the following:

- the application of any new or amended SDPC's~~,~~ or DFPC's;
- changes to ~~end of day~~EoD total system ~~linepack~~LP target;
- ~~significant~~ changes made to M~~arket C~~learing ~~Engine~~ reference data;
- declaration of a threat to *system security* to allow AEMO to run an ad-hoc *operating schedule;*
- publication of an ad hoc *operating schedule*;
- time and date of the commencement and completion of any ~~*market*~~ *intervention*;
- time and date of the commencement and completion of any *Market* suspension;
- ~~time and date of the commencement and completion of any *system force majeure event*;~~
- ~~-~~time and date of the commencement and completion of any threats to *system security*;
- time and date of the commencement and completion of an *administered price period*; and
- any other information ~~that~~ AEMO reasonably considers ~~of which~~ it needs to notify *Market Participants*.