~~ELECTRICITY INDUSTRY ACT~~

~~ELECTRICITY INDUSTRY (WHOLESALE ELECTRICITY MARKET) REGULATIONS 2004~~

~~WHOLESALE ELECTRICITY MARKET RULES~~

~~Power System Operation Procedure:~~

~~Short Term Projected Assessment of System Adequacy (ST PASA)~~

~~**Commencement:**~~ ~~This Market Procedure is to have effect from 8:00am (WST) on the same date as the Wholesale Electricity Market Rule, in which this procedure is made in accordance with, commences.~~

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1. SHORT TERM PROJECTED ASSESSMENT OF SYSTEM ADEQUACY ('ST PASA')

This Procedure, Power System Operating Procedure Short Term Projected Assessment of System Adequacy ('ST PASA'), details procedures that System Management and Rule Participants must follow in the preparation and publication of the Short Term Projected Assessment of System Adequacy report.

2. RELATIONSHIP WITH MARKET RULES

1. This Procedure has been developed in accordance with, and should be read in conjunction with clause 3.17 of the Wholesale Electricity Market (WEM) Rules (Market Rules).

2. References to particular Market Rules within the Procedure in bold and square brackets **[MR XX]** are current as at 16 October 2008. These references are included for convenience only, and are not part of this procedure.

In performing its functions under the Market Rules, System Management may be required to disclose certain information to Market Participants and Network Operators. In selecting the information that may be disclosed, System Management will utilize best endeavours and act in good faith to disclose only the information reasonably required by the application of the Market Rules.

3. SCOPE

The ST PASA Procedure details processes that Rule Participants and System Management must follow in conducting Short Term PASA studies to assist System Management in setting Ancillary Service requirements, assessing final approval of Planned outages, assessing the availability of capacity holding Capacity Credits amongst other functions associated with the management of Power System Security and Power System Reliability in the SWIS. The Short Term PASA studies are based on a three week planning horizon.

Similarly, Medium Term Projected Assessment of System Adequacy studies are derived from a common formulation, but are instead based on a longer three year planning horizon.

4. ASSOCIATED PROCEDURES AND OPERATION STANDARDS

The following Power System Operation Procedures are associated with this ST PASA procedure:

a. Power System Operation Procedure – Power System Security
a. Power System Operation Procedure – Facility Outages

~~b. Power System Operation Procedure – MT PASA~~

5. TIMETABLE FOR ST PASA

1. The timing requirements that System Management must follow when completing and reviewing a Short Term PASA study, the provision of this information to the Independent Market Operator ('IMO'), and the IMO's obligation to publish the relevant information are defined in the Market Rules **[MR 3.17.1, MR 3.17.2** and **MR 3.17.6]**.

2. Where a Rule Participant becomes aware that information submitted in accordance with the Market Rules **[MR 3.17.5]** has materially changed during the first week covered by the previous ST PASA study, System Management shall modify the ST PASA study and resubmit to the IMO.

A material change may be quantified as being equivalent to a loss of a major generator capable of generating more than 300 MW or other circumstances which System Management deems necessary.

3. System Management will prepare and maintain an internal process detailing how and by which method the ST PASA results are transmitted to the IMO.

6. INFORMATION REQUIREMENTS

6.0 General Requirements

1. System Management may direct Rule Participants in writing from time to time to provide the information specified in the Market Rules **[MR 3.17.5].**

1. A Market Customer must provide information on demand forecasts for loads designated as Significant loads, where these Market Customers are anticipating a major change to the demand pattern of the Significant Load. In defining a Significant Load System Management will consider the following:

    a) a consumer load will be deemed a Significant Load when its peak demand exceeds 20MW or connection is made to a transmission system consuming in excess of 10 MW;

a) a major change to the demand pattern of a Significant Load to be an increase or decrease of at least 10 MW in profile of a load exceeding 20MW, where that change is anticipated to occur in one or more of the periods set out in the table below; or

SEASON WEM RULES

POWER SYSTEM OPERATION PROCEDURE: SHORT TERM PROJECTED ASSESSMENT OF SYSTEM ADEQUACY (ST PASA)

Winter

Summer	-	Midday to 6.00 PM

Market CustomersPREPARED BY:	System Management (WA)
DOCUMENT REF:	SO_OP_WA_3809
VERSION:	3.0
EFFECTIVE DATE:	TBC 2019
STATUS:	DRAFT FOR CONSULTATION

Approved for distribution and use by:

APPROVED BY:

TITLE:

VERSION RELEASE HISTORY

	Effective Date	Summary of Changes
1	21 September 2006	Power System Operation Procedure (Market Procedure) for Short Term Projected Assessment of System Adequacy
2	1 April 2009	System Management amended changes to the procedure resulting from Procedure Change Report PPCL0006
3.0	TBC 2019	Changes resulting from Procedure Change Proposal AEPC_2019_01

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TABLES

1. PROCEDURE OVERVIEW

1.1. Relationship with the Wholesale Electricity Market Rules

1.1.1. This Power System Operation Procedure (PSOP): Short Term Projected Assessment of System Adequacy (Procedure) has been developed in accordance with clause 3.17.10 of the Wholesale Electricity Market Rules (WEM Rules).

1.1.2. References to particular WEM Rules within the Procedure in bold and square brackets **[Clause XX]** are included for convenience only and are not part of this Procedure.

1.2. Interpretation

1.2.1. In this Procedure:

(a) terms that are capitalised, but not defined, have the meaning given in the WEM Rules;

(b) to the extent that this Procedure is inconsistent with the WEM Rules, the WEM Rules prevail to the extent of the inconsistency;

(c) a reference to the WEM Rules, or Market Procedures, includes any associated forms required or contemplated by the WEM Rules or Market Procedures;

(d) words expressed in the singular include the plural and vice versa; and

(e) unless the context requires otherwise, references to AEMO include AEMO in its System Management capacity.

1.2.2. In addition, the following defined terms have the meaning given.

Table 1 Defined Terms

Term	Definition
PASA	Projected Assessment of System Adequacy.
PASA Reference Point	A value for each six-hour period of the Planning Horizon **[Clause 3.17.3]**.
PASA Reserve Margin	The value identified in step 4.1.2.
PASA Report	The results of the PASA study published as required by WEM Rule 3.17.1 and 3.17.9.
Planning Horizon	Three weeks, starting from 8 AM on the day following the day on which the Short Term PASA study is performed **[Clause 3.17.3]**.

1.3. Purpose and application of this Procedure

1.3.1. The purpose of this Procedure is to document the processes that AEMO must follow when conducting a Short Term PASA study **[Clause 3.17.10]**.

1.4. Associated documents

~~1.1.1.~~1.4.1. The documents in Table 2 provide ~~System Management with the load change~~background information ~~for each Significant Load for the applicable period.~~to this Procedure.

Table 2 Background Procedures

Reference	Title	Location
SO_OP_WA_3804	PSOP: Facility Outages	Market Web Site
SO_OP_WA_3806	PSOP: Medium Term PASA	Market Web Site
SO_OP_WA_3808	PSOP: Power System Security	Market Web Site

TIMETABLE

2.

2.1. Timing requirements

2.1.1. The timing requirements that AEMO must follow when completing and reviewing a Short Term PASA study, and AEMO's obligation to publish relevant information in the Short Term PASA Report, are specified in the WEM Rules [Clause 3.17.1].

2.1.2. AEMO must carry out a Short Term PASA study:

(a) every Thursday, and publish the Short Term PASA results referred to in clause 3.17.9 of the WEM Rules by 4:30 PM [Clause 3.17.1(a)]; and

(b) on any other day if it determines that changes have occurred that would materially affect market outcomes during the first week of the period covered by the previous Short Term PASA study, and publish the Short Term PASA results reffered to in clause 3.17.9 of the WEM Rules as soon as practicable [Clause 3.17.1(b)].

3. INFORMATION REQUIREMENTS

3.1. General requirements

~~4.~~ Unless otherwise directed by AEMO, Rule Participants must ~~use reasonable endeavours to provide System Management with a reasonable estimate of the amount of demand side management capacity that can be provided.~~

~~4.1.3.~~3.1.1. ~~With the exception of demand side management, where information is provided by Network Operators, Market Generators and Market Customers this~~, before 10 AM every Thursday, submit the information ~~must be provided via the System Management Market Information Technology ('SMMITS') web interface system, unless otherwise directed.~~to AEMO detailed in clause 3.17.5 of the WEM Rules for each PASA Reference Point in the Planning Horizon.

~~1. Rule Participants must provide demand side management related information to System Management via email, unless otherwise directed.~~

3.1.2. AEMO must specify the format and manner of submission of the information in step 3.1.1 on the Market Web Site.

3.2. Directions

3.2.1. Where AEMO determines the information in step 3.1.1 is not required, AEMO must publish a direction on the Market Web Site..

3.2.2. AEMO may revoke directions published in accordance with step 3.2.1 for any Rule Participant or class of Rule Participant at any time.

3.2.3. Prior to revoking a direction published in accordance with step 3.2.1 AEMO must engage with the affected Rule Participants or class of Rule Participants in relation to the date on which the revocation becomes effective and the method of provision of information by the Rule Participant(s) to AEMO.

3.2.4. To revoke a direction published in accordance with step 3.2.1, AEMO must publish a revocation on the Market Web Site at least 5 Business Days prior to the date from which the revocation becomes effective.

~~4.2.~~3.3. Allowable ~~Use~~use of ~~System Management Data~~AEMO data

~~4.2.1.~~3.3.1. ~~System Management~~AEMO may ~~utilise~~use its own information ~~in certain circumstances in substitution~~instead of information submitted by Rule Participants ~~in accordance with the Market Rules~~ ~~[MR~~[Clause 3.17.8~~],~~] and ~~shall~~must document reasons for doing so in the ~~ST~~Short Term PASA report~~.~~ [Clause 3.17.9(i)].

3.3.2. In addition to information provided by a Rule Participant, AEMO may use information that it develops in accordance with clause 3.17.7 of the WEM Rules, and any other information AEMO considers appropriate.

~~4.3.~~3.4. Submission of Revised Data

~~4.3.1.~~3.4.1. When a Rule Participant becomes aware of ~~circumstances relating to~~ material changes to information provided in ~~ST PASA detailed in~~ accordance with step 3.1.1 during the ~~Market Rules~~first week of the period covered by the previous Short Term PASA study, Rule Participants must submit revised data ~~including:~~as soon as practicable and, in any case, within 24 hours [Clause 3.17.6].

4. PASA RESERVE MARGIN

4.1. General

4.1.1. AEMO must assess the PASA Reserve Margin for each PASA Reference Point in the Short Term PASA Planning Horizon.

4.1.2. The PASA Reserve Margin is the capacity remaining in service, as detailed in step 4.2.1, used to evaluate Outage Plans [Clause 3.18.11] and to approve Planned Outages [Clause 3.19.6].

4.1.3. AEMO must indicate in the PASA Report any PASA Reference Point within the Planning Horizon where the PASA Reserve Margin is less than zero.

4.1.4. AEMO must develop and publish methodologies detailing:

(a) Relevant assumptions related to the aggregation of data for the PASA study;

(b) The peak load forecast, where this must include:

(1) daily, weekly and monthly demand patterns;

(2) seasonal variations;

(3) weather conditions;

(4) significant loads; and

(5) assumptions regarding block loads.

(c) The determination of transmission constraints between potentially constrained regions in accordance with clause 3.17.9(f) of the WEM Rules;

(d) The allowance for the Ancillary Service Requirements;

(e) The allowance for the Ready Reserve Standard in accordance with clause 3.18.11A of the WEM Rules;

(f) The allowance for the unavailability of Scheduled Generation;

(g) The allowance for the unavailability of Non-Scheduled Generation which must consider seasonal variation and fuel type; and

(h) The allowance for the unavailability of Demand Side Programmes.

4.1.5. Prior to publishing the methodologies in step 4.1.4, AEMO must engage with Market Participants and Network Operators in relation to the implementation of the methodologies.

Assessment of the

~~e) any variations to capacity or performance from Standing Data; and~~
~~f) changes from the details in the outage plans submitted to System Management.~~

~~4.8 Possible Errors or Omissions~~

~~4. Where System Management has not received information from a participant in the time required, or the information contains either omissions or possible errors, System Management may use reasonable endeavours to contact the participant to seek clarification or further details.~~

~~4. The participant must respond to this request in the earliest time practical.~~

~~4.13 Situations where System Management can use its own information~~

~~In addition to information provided by a Rule Participant, System Management may use information that it develops pursuant to the Market Rules [MR 3.17.7], and any other information System Management considers necessary.~~

~~4. ST PASA LOAD FORECAST~~

~~1. System Management must prepare a load forecast for the SWIS system for each of the 21 days covered by ST PASA using System Management's modelling and forecasting system. The load forecast modelling system must forecast daily peaks using statistically derived trends in daily, weekly and monthly demand patterns and weather conditions. Account must be taken of the data on Significant Loads.~~

~~4.20.7.1 Peak System Load Forecasts~~

~~System Management must ensure that the results of a Short Term PASA study includes, for the Short Term PASA Planning Horizon, the peak load forecasts for scenarios stipulated in the Market Rules [MR 3.17.9(a) and MR 3.17.9(b)].~~

~~4. ST PASA PLANNING CRITERIA~~

~~4.25 Generation Security~~

~~System Management must allow for sufficient generation to be available to cater for forced outages of generation facilities. The value of unplanned unavailability will be the loss of the largest total generation, remaining after outages have been accounted for, resulting from a single contingency event.~~

~~4.28 Transmission Security~~

~~4.2. System Management must adjust total generation, to take account of any constraints on the transmission system,~~PASA Reserve Margin

4.2.1. AEMO must estimate the applicable PASA Reserve Margin by forecasting:

The capacity of Scheduled Generators, Non-Scheduled Generators and Demand Side Programmes after allowing for ~~all credible contingencies specified in the PSOP: Power System Security and maintain operations within the boundaries of the Technical Envelope.~~

~~1.3 Ancillary Services~~

~~System Management must allow for sufficient Ancillary Services and Ready Reserve generation to be available, taking into account the non-availability of facilities that provide Ancillary Services, to meet the criteria specified in the PSOP: Power System Security and maintain operations within the boundaries of the Technical Envelope.~~

~~1.6 Demand Management~~

~~System Management must prepare the ST PASA based on a reasonable forecast of the availability of all Interruptible Loads.~~

~~1. ST PASA RESERVE MARGIN~~

~~System Management must assess the "Reserve Margin" for each study period within the ST PASA planning horizon.~~

1.13.0.1.1.1. The Reserve Margin is defined as the spare generation available after the forecast peak load has been met, and all security and ancillary service requirements have been satisfiedoutages that AEMO.

1.15 Assessment of the Reserve Margin

2. System Management must estimate the applicable Reserve Margin by forecasting:

(r)(a) the capacity of the total generation remaining in service after allowing for Planned, Scheduled and any other outages that System Management has knowledge of or has been informed of, [Clause 3.18.11(a)], less

(s)(b) theThe mean plus two standard deviation system load forecast or expected load including a margin for uncertainty and ensuring that,peak load forecast [Clause 3.18.11(a)], calculated in accordance with step 4.1.4(b), less

(t)(c) theThe effects of any Generationgeneration being constrained due to insufficient transmission capacity remaining in service, [Clauses 3.18.11(b) and 3.17.9(f)] calculated according to step 4.1.4(c), less

(v)(d) anAn allowance for thatthe quantity of generation capacity required to operate as an maintain the Ancillary Service, Requirements [Clause 3.18.11(c)] calculated according to maintain the frequency standards specified in the PSOP: Power System Security,step 4.1.4(d), less

a) as quantified within the planning criteria set out in section 8 of this procedure.

2. The facilities remaining in service must allow System Management to operate the Power System within the applicable Technical Envelope and the criteria specified in the PSOP: Power System Security.

4.29. 10. CONTENT OF SHORT TERM PASA STUDY RESULTS REPORT

1. The ST PASA Study Results Report (ST PASA report) must set out the forecast value of the Short Term Reserve Margin, the data set out in the Market Rules, and other data relevant to the short term security assessment of the SWIS system.

2. Where practical, the information should be presented in graphical form in SMMITS and cover each period of a 3 week ST PASA planning horizon.

3. System Management must highlight in its results those periods within the ST PASA planning horizon where Reserve Margin is zero or negative and where changes to outage plans are needed to restore the Reserve Margin to a positive level.

4. The published study must also provide graphical representation of the information on generation capacity and forecast data from which System Management's estimation of the Reserve Margin was compiled, as well as an estimate of the applicable Reserve Margin.

10.1 Aggregate forecast information on ST PASA

1. System Management must include in the ST PASA report the information set out in the Market Rules [MR 3.17.9] and the additional information listed in Table 1 below for each day of the ST PASA planning horizon.

	TABLE 1	
	ST PASA Reporting	**Description**
1.	Reserve Margin	The quantity defined in Rule 3.17.9(d) and being for each study period, the 'mean plus 2 standard deviation peak load forecast, minus the total forecast available generation capacity.
2.	Peak Load Forecasts	The peak load estimate for the SWIS for the following scenarios:
3.	Minimum load forecasts	The minimum overnight load forecasts as estimated for each of the overnight study periods.
5.	Forecast total installed	The total installed generation capacity forecast for each

	~~Generation Capacity~~	~~study window.~~
~~6.~~	~~Forecast total available Demand Management~~	~~The total available Demand Side Management capacity~~
~~7.~~	~~Transmission~~	~~Any generation capacity output constrained as a consequence of transmission limitations.~~
	~~Constrained Capacity loss of Generation Facilities~~	~~The provision for unplanned un-availability of generation~~
		~~The quantity of generation capacity diverted to serve as an ancillary service, and not available for energy supply purposes.~~
~~10.~~	~~Additional Data~~	~~Any parameter that System Management considers useful in highlighting information relevant to the adequacy of the SWIS~~

~~10.2 Explanatory information in ST PASA report~~

~~1. System Management may include as an attachment to the ST PASA report additional information to assist Participants in understanding and utilising the information in ST PASA.~~

~~2. System Management should use reasonable endeavours to provide explanation of changes where there are significant differences in the level of Reserve Margin between consecutive ST PASA reports~~

~~4.30. 11. AGGREGATION OF INFORMATION~~

(e) ~~1. In publishing the ST PASA report, System Management will endeavour to ensure that as much as is practical, individual participant's data submitted to the System Management cannot be identified. Information will be published in aggregate form for each class of Market Participant.~~An allowance for the Ready Reserve Standard [Clause 3.18.11(aA)] calculated according to step 4.1.4(e), less:

(f) An allowance for the unavailability of Scheduled Generation calculated according to step 4.1.4(f), less

(g) An allowance for the unavailability of Non-Scheduled Generation calculated according to step 4.1.4(g), less

(h) An allowance for the unavailability of Demand Side Programmes calculated according to step 4.1.4(h).

5. CONTENT OF PASA REPORT

5.1. General

5.1.1. AEMO must include in the PASA Report for each PASA Reference Point in the Planning Horizon:

(a) the information set out in WEM Rule 3.17.9; and

(b) the PASA Reserve Margin as determined under this Procedure.

5.1.2. AEMO must use reasonable endeavours to include in the PASA Report sufficient information to allow Rule Participants to identify the assumptions used from each methodology in step 4.1.4.

5.1.3. When publishing the PASA Report, AEMO must have regard to the confidentiality principle specified in clause 10.2.3(k) of the WEM Rules, which requires information to be aggregated or provided in a form which does not disclose confidential information.