# POWER SYSTEM ~~OPERATING~~ OPERATION PROCEDURE: SHORT TERM PROJECTED ASSESSMENT OF SYSTEM ADEQUACY

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# VERSION RELEASE HISTORY

| Version | Effective Date | Summary of Changes |
|---|---|---|
| 1 | 21 September 2006 | Power System Operation Procedure (Market Procedure) for Commissioning and Testing |
| 2 | 17 July 2009 | System Management amended changes to the procedure resulting from Procedure Change Report PPCL0009 |
| 3 | 23 June 2011 | System Management amended changes to the procedure resulting from Procedure Change Report PPCL0016 |
| 4 | Balancing Market Commencement Day | System Management replacement of the procedure resulting from Procedure Change Report PPCL0023 |
| 5 | 1 March 2014 | System Management amended changes to the procedure resulting from Procedure Change Proposal PPCL 0025 |
| 6.0 | dd MMM YYYY | Changes resulting from Procedure Change Proposal AEPC_2018_XX |

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# 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 clauses 3.17 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 current as at 13 October 2017. These references are included for convenience only and are not part of this Procedure.

## 1.2 Interpretation

In this Procedure:

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

(b) to the extent that this Procedure is contrary or inconsistent with the WEM Rules, the WEM Rules shall 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; and

(d) words expressed in the singular include the plural or vice versa.

1.2.2 In addition, the following defined term has the meaning given.

**Table 1 Defined Terms**

| Term | Definition |
|---|---|
| **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]**. |
| **Reserve Margin** | The value identified in step 4.1.2. |

## 1.3 Purpose and application of this Procedure

1.3.1 The purpose of this Procedure is to detail the processes to be followed by AEMO, Market Participants and Network Operators when conducting a Medium Term PASA study **[Clause 3.17.10]**.

## 1.4 Associated documents

1.4.1 The following documents in Table 2~~Table 2~~~~Table 2~~ (available on the Market Web Site) provide background information to this Procedure:

**Table 2 Background Procedures**

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

# 2 TIMETABLE

## 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 the relevant information are defined in the ~~Market~~ WEM Rules **[Clauses 3.17.1, ~~Clause~~ 3.17.2** and **~~Clause~~ 3.17.6]**.

~~2.1.2 Where a Rule Participant becomes aware that information submitted in accordance with the Market Rules **[Clause 3.17.5]** has materially changed during the first week covered by the previous ST PASA study, AEMO shall modify the ST PASA.~~

~~2.1.3 A material change may be quantified as being equivalent to a loss of a major Market Generator that is capable of generating more than 300 MW, or other circumstances which AEMO deems necessary.~~

# 3 INFORMATION REQUIREMENTS

## 3.1 General requirements

3.1.1 AEMO may direct Rule Participants from time to time, to provide the information specified in the WEM Rules, in a manner and ~~indicated~~timeframe specified by AEMO ~~AEMO may direct Rule Participants in writing from time to time to provide the information specified in the Market Rules~~ **[Clause 3.17.5].**

3.1.2 A Rule Participant must provide the information requested in step 3.1.1 within the timeframe specified by AEMO.

3.1.3 AEMO may seek clarification or further details of the information provided in step 3.1.1.

3.1.4 A Rule Participant must provide the information requested in step 3.1.3 within the timeframe specified by AEMO.

~~3.1.2 A Market Customer must provide information on demand forecasts for loads or Demand Side Programmes designated as Significant loads, where these Market Customers are anticipating a major change to the demand pattern of the Significant Load or Demand Side Programme. In defining a Significant Load or Demand Side Programme, AEMO will consider the following:~~

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

~~(b) A major change to the demand pattern of a Significant Load or Demand Side Programme 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 Table 3; or~~

~~**Table 3 Seasonal Periods**~~

| ~~**Season**~~ | ~~**Weekday Morning**~~ | ~~**Weekday Evening**~~ |
|---|---|---|
| ~~**Winter**~~ | ~~7:00 AM to 9:00 AM~~ | ~~5:00 PM to 8:00 PM~~ |
| ~~**Summer**~~ | ~~-~~ | ~~12:00 PM to 6:00 PM~~ |

~~(c) Market Customers must provide AEMO with the load change information for each Significant Load and Demand Side Programmes for the applicable period.~~

~~3.1.3 Rule Participants must use reasonable endeavours to provide AEMO with a reasonable estimate of the amount of demand side management capacity that can be provided.~~

~~3.1.4 With the exception of demand side management, where information is provided by Network Operators, Market Generators and Market Customers this information must be provided via the AEMO Market Information Technology ('SMMITS') web interface system, unless otherwise directed.~~

~~3.1.5 Rule Participants must provide demand side management related information to AEMO via email, unless otherwise directed.~~

## 3.2 Allowable use of AEMO data

3.2.1 AEMO may utilise its own information in certain circumstances in substitution of information submitted by Rule Participants ~~in accordance with the Market Rules~~ **[Clause 3.17.8]**, and shall document reasons for doing so in the ST PASA report **[Clause 3.17.9(i)]**.

3.2.2 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~~pursuant to the Market Rules **[Clause 3.17.7]**~~, and any other information AEMO considers necessary.

## 3.3 Submission of Revised Data

3.3.1 ~~3.3.1~~ When a Rule Participant becomes aware of circumstances relating to material changes to information provided in accordance with step 3.1.1~~3.1.1~~ for the first week of the Planning Horizon, Rule Participants must submit revised data within 24 hours **[Clause 3.17.6]**.

~~3.3.1 When a Rule Participant becomes aware of circumstances relating to material changes in ST PASA detailed in the Market Rules, Rule Participants must submit revised data including:~~

~~(a) Any variations to capacity or performance from Standing Data; and~~

~~(b) Changes from the details in the outage plans submitted to AEMO.~~

### ~~3.4 Additions and omissions in Rule Participant data~~

### ~~3.5 AEMO shall review information provided by Rule Participants, and where necessary, seek additional information or clarifications. Rule Participants must provide any additional information or clarifications when requested by AEMO in accordance with the Market Rules [Clause 3.16.8 and Clause 3.16.8A].~~

### ~~3.6 The participant must respond to this request in the earliest time practical.~~

### ~~3.7 Situations where AEMO can use its own information~~

~~3.7.1 In addition to information provided by a Rule Participant, AEMO may use information that it develops pursuant to the Market Rules **[Clause 3.17.7]**, and any other information AEMO considers necessary.~~

## ~~4 LOAD FORECAST~~

### ~~4.1 General~~

~~4.1.1 AEMO must prepare a load forecast for the South West Interconnected system (SWIS) system for each of the 21 days covered by ST PASA using AEMO'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.~~

### ~~4.2 Peak demand load forecasts~~

~~4.2.1 AEMO 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 [Clause 3.17.9(a) and Clause 3.17.9(b)].~~

## ~~5 ST PASA PLANNING CRITERIA~~

### ~~5.1 Generation security~~

~~5.1.1 AEMO must allow for sufficient generation to be available to cater for Forced Outages of Market Generators. 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.~~

### ~~5.2 Transmission security~~

~~5.2.1 AEMO must adjust total generation to take account of any constraints on the transmission system, after allowing for all credible contingencies specified in the PSOP: Power System Security and maintain operations within the boundaries of the Technical Envelope.~~

### ~~5.3 Ancillary Services~~

~~5.3.1 AEMO 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.~~

## ~~5.4 Demand management~~

~~5.4.1 AEMO must prepare the  based on a reasonable forecast of the availability of all Interruptible Loads.~~

# ~~6~~4 SHORT TERM RESERVE MARGIN

## ~~6.1~~4.1 General

~~6.1.1~~ AEMO must assess the ~~Short Term~~ Reserve Margin for ~~each day of~~ the ~~ST~~ Short Term PASA Planning Horizon.

4.1.1 ~~The Short Term Reserve Margin is the spare generation capacity available after the forecast peak load has been met and all security standards and Ancillary Service requirements have been satisfied.~~

4.1.2 The Reserve Margin is excess capacity as detailed in step 4.2.1.

4.1.3 AEMO must indicate in its results those periods within the ST PASA Planning Horizon where the Reserve Margin is less than zero.

~~(a)~~

## ~~6.2~~4.2 Assessment of ~~Medium~~ Short Term Reserve Margin

~~6.2.1~~4.2.1 AEMO must estimate the applicable ~~Medium Term~~ Reserve Margin by forecasting:

(a) The capacity of ~~the total generation~~Scheduled Generators, Non-Scheduled Generators and Demand Side Programmes after allowing for ~~Planned, Scheduled and any other~~ outages that AEMO has knowledge of or has been informed of, less

(b) The mean plus two standard deviation system peak load forecast, less

(c) The effects of any generation being constrained due to insufficient transmission capacity remaining in service, less

(d) An allowance for that quantity of generation capacity required to operate as an Ancillary Service, to maintain the frequency standards specified in the PSOP: Power System Security, less

(e) An allowance for Ready Reserve, less

~~(e)~~(f) An allowance for the availability of Non-Scheduled Generation and Demand Side Programmes~~As quantified within the planning criteria set out in section 5 of this Procedure~~.

# ~~7 CONTENT OF ST PASA STUDY RESULTS REPORT~~

## ~~7.1 General~~

~~7.1.1 For the ST PASA Study Results Report that is prepared and published each week, AEMO 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.~~

7.1.2 Where practical, the information should be presented in graphical form in SMMITS, and cover each period of a three year ST PASA Planning Horizon.

7.1.3 AEMO 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.

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

7.1.5 Aggregate forecast information

7.1.6 AEMO must include in the ST PASA report the information set out in the Market Rules **[Clause 3.17.9]** and the additional information listed in Table 4, for each day of the planning horizon.

**Table 4 ST PASA Reporting Parameters**

| Reporting Parameter | Description |
|---|---|
| Reserve Margin | The quantity defined in Market Rule **[Clause 3.17.9(d)]** and being for each study period, the mean plus two standard deviation peak load forecast, minus the total forecast available generation capacity. |
| Peak Load Forecasts | The peak load estimate for the SWIS for the following scenarios:<br>(a) Mean;<br>(b) Mean plus one standard deviation; and<br>(c) Mean plus two standard deviations. |
| Minimum load forecasts | The minimum overnight load forecasts as estimated for each of the overnight study periods. |
| Forecast total installed generation capacity | The total installed generation capacity forecast for each study window in the ST Planning Horizon. |
| Forecast total available Generation Capacity | The total available Generation Capacity available in each study window. |
| Forecast total available Demand Management Capacity | The total available Demand Side Management capacity available in each study period. |
| Transmission Constrained Capacity | Any generation capacity output constrained as a consequence of transmission limitations. |
| Provision for unplanned loss of Generation Facilities | The provision for unplanned un-availability of generation facilities (forced outages). |
| Ancillary Services | The quantity of generation capacity diverted to serve as an ancillary service, and not available for energy supply purposes. |
| Additional Data | Any parameter that AEMO considers useful in highlighting information relevant to the adequacy of the SWIS over the study period. |

## 7.2 Explanatory information

7.2.1 AEMO may include as an attachment to the ST PASA report additional information to assist Rule Participants in understanding and utilising the information in ST PASA.

7.2.2 AEMO 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.

# ~~8 AGGREGATION OF INFORMATION~~

~~8.1.1 In publishing the ST PASA report, AEMO will endeavour to ensure that as much as practical, individual participant's data submitted to AEMO cannot be identified. Information will be published in aggregate form for each class of Market Participant.~~