

MARKET PROCEDURE: UNDERTAKING THE LONG TERM PASA AND CONDUCTING A REVIEW OF THE PLANNING CRITERION

PREPARED BY: System Capacity (WA)
DOCUMENT REF:
VERSION: 4.0
EFFECTIVE DATE: 1 October 2017
STATUS: FINAL

Approved for distribution and use by:

APPROVED BY: Peter Geers
TITLE: Executive General Manager, Markets

VERSION RELEASE HISTORY

Version	Effective Date	Summary of Changes
1.0	1 June 2010	New Market Procedure for undertaking the Long Term PASA and conducting a review of the Planning Criterion resulting from PC_2009_11
2.0	30 November 2015	Changes resulting from the transfer of functions from the IMO to AEMO
3.0	18 April 2017	Changes resulting from the transfer of System Management functions to AEMO
4.0	1 October 2017	Changes resulting from amendments to the Reserve Capacity Mechanism as per AEPC_2017_06.

CONTENTS

1.	PROCEDURE OVERVIEW	4
1.1.	Relationship with the Wholesale Electricity Market Rules	4
1.2.	INTERPRETATION	4
1.3.	PURPOSE AND APPLICATION OF THIS PROCEDURE	4
2.	UNDERTAKING THE LONG TERM PROJECTED ASSESSMENT OF SYSTEM ADEQUACY	5
2.1.	Gathering information from Market Generators	5
2.2.	Gathering information from Market Customers	5
2.3.	Gathering data from Network Operators	6
2.4.	Gathering data from non-Rule Participants	6
2.5.	Procedure to be followed by Rule Participants in providing data	6
2.6.	Procedure to be followed by AEMO on receipt of data	6
2.7.	AEMO's preparation of forecasts	7
2.8.	AEMO assessment of reliability	8
2.9.	AEMO development of the Availability Curve	8
2.10.	AEMO publication of the Long Term PASA	9
3.	CONDUCTING A REVIEW OF THE PLANNING CRITERION	10
3.1.	Determination of whether a review should be undertaken	10
3.2.	Initiation of Rule Participant Support	10
3.3.	ERA preparation for Review	11
3.4.	ERA preparation of Draft Report	11
3.5.	ERA publication of Final Report	12

LIST OF TABLES

Table 1: Defined terms	4
------------------------	---

1. PROCEDURE OVERVIEW

1.1. Relationship with the Wholesale Electricity Market Rules

- 1.1.1. This Market Procedure: Undertaking the Long Term PASA and conducting a review of the Planning Criterion (Procedure) has been developed in accordance with clause 4.5.14 of the Wholesale Electricity Market Rules (WEM Rules), and should be read in conjunction with clause 4.5 of the WEM Rules.
- 1.1.2. References to particular WEM Rules within the Procedure in bold and square brackets **[Clause XX]** are current as at 1 October 2017. These references are included for convenience only and are not part of this Procedure.

1.2. Interpretation

- 1.2.1. In this Procedure:
- terms that are capitalised but not defined in this Procedure have the meaning given in the WEM Rules;
 - 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;
 - a reference to the WEM Rules or Market Procedures includes any associated forms required or contemplated by the WEM Rules or Market Procedures; and
 - 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
Operational Consumption	The electrical energy supplied by Scheduled Generators and Non-Scheduled Generators, which excludes the electrical energy supplied by rooftop PV.
PASA	Projected Assessment of System Adequacy

1.3. Purpose and application of this Procedure

- 1.3.1. The purpose of this Procedure is to describe the steps that:
- AEMO is required to undertake in preparing the Long Term PASA and Statement of Opportunities (SOO);
 - Rule Participants, and other parties, must follow in providing information to AEMO to assist in preparation of the Long Term PASA and SOO;
 - the ERA must follow in conducting the review under clause 4.5.15 of the WEM Rules; and
 - Rule Participants and other parties must follow in providing information to the ERA to assist in the preparation of the review under clause 4.5.15 of the WEM Rules.
- 1.3.2. This Procedure applies to:
- AEMO in preparing the Long Term PASA and SOO;
 - Rule Participants and other entities in providing information to AEMO and the ERA;

- (c) the ERA in undertaking any review of the Planning Criterion;
- (d) any third party contracted by the ERA to undertake any part of a review of the Planning Criterion; and
- (e) stakeholders that may be part of the consultation process for reviewing the Planning Criterion and the process by which AEMO forecasts South West interconnected system (SWIS) peak demand.

2. UNDERTAKING THE LONG TERM PROJECTED ASSESSMENT OF SYSTEM ADEQUACY

2.1. Gathering information from Market Generators

- 2.1.1. By 1 April of each year, AEMO must notify Market Generators of the information that it requires from them regarding **[Clause 4.5.3]**:
- (a) generation capacity expected to be available over the forecast period, including details on seasonal capacities;
 - (b) Ancillary Service capabilities of each available Facility over the forecast period;
 - (c) long duration outages planned over the forecast period; and
 - (d) production profiles for Non-Scheduled Generation Facilities over the forecast period.

2.2. Gathering information from Market Customers

- 2.2.1. By 1 April of each year, AEMO must notify Market Customers of the information that it requires from them regarding **[Clause 4.5.3A]**:
- (a) expected Demand Side Management (DSM) capabilities and expected MW reduction in peak consumption implemented by retailers to reduce their Individual Reserve Capacity Requirements under clause 4.28.8(b);
 - (b) the capacity of any large loads (greater than 10 MW) that will be added to, or removed from the system;
 - (c) for Intermittent Loads and Loads that are expected to be registered and operating as Intermittent Loads during the second Capacity Year commencing during the Long Term PASA Study horizon:
 - (i) the amount of capacity required to serve that Load in the event of a failure of on-site generation where this amount of capacity cannot exceed the greater of:
 - (A) either:
 - a. for an existing Intermittent Load, the maximum allowed level of Intermittent Load specified in Standing Data for that Intermittent Load at the time of providing the data; or
 - b. for an Intermittent Load that is yet to be registered with AEMO, zero; and
 - (B) the contractual maximum demand associated with that Intermittent Load to apply during the Capacity Year to which the nomination relates. The Market Customer must provide evidence to AEMO of this contractual maximum demand level unless AEMO has previously been provided with that evidence;
 - (d) for each Intermittent Load that is yet to be registered with AEMO:
 - (i) the location of the Load and the NMI of that load if available;

- (ii) evidence that the Load can be expected to satisfy the requirements to be registered as an Intermittent Load during the second Capacity Year within the Long Term PASA Study Horizon; and
- (iii) the expected firm MW capacity and location of any generation system to serve that Intermittent Load in accordance with clause 2.30B.2(a), that is to be located at a different connection point to the Intermittent Load.

2.3. Gathering data from Network Operators

- 2.3.1. By 1 April of each year, AEMO must notify Network Operators of the information that it requires from them regarding **[Clause 4.5.3]**:
- (a) expected transmission network capabilities allowing for expansion plans, losses and constraints **[Clause 4.5.2(d)]**;
 - (b) any potential transmission capacity constraints or restrictions in sub-regions of the SWIS **[Clause 4.5.10(c)]**;
 - (c) potential transmission, generation or DSM capacity augmentation options that may alleviate shortfalls identified above **[Clause 4.5.10(d)]**; and
 - (d) the expected amount of capacity required to maintain normal frequency control over the Long Term PASA Study Horizon.

2.4. Gathering data from non-Rule Participants

- 2.4.1. AEMO may identify and request information from persons who are not Rule Participants but who may have information in respect to the areas described under clause 4.5.2 of the WEM Rules in respect of each year of the Long Term PASA Study Horizon **[Clause 4.5.5]**.
- 2.4.2. The information and data requested by AEMO may change in the future but must be for the purposes of the requirements of this Procedure and the WEM Rules.
- 2.4.3. AEMO must provide any such request for information in writing.

2.5. Procedure to be followed by Rule Participants in providing data

- 2.5.1. Rule Participants must provide the data requested by AEMO under steps 2.1.1, 2.2.1 and 2.3.1 within 15 Business Days from the date of that request **[Clause 4.5.4]**.
- 2.5.2. AEMO may seek clarification of any and all data or information that is provided in accordance with the WEM Rules or this Procedure and the Rule Participant must provide any clarifications as necessary **[Clause 4.5.6]**.

2.6. Procedure to be followed by AEMO on receipt of data

- 2.6.1. AEMO must review the information provided to it in accordance with this Procedure and where necessary, seek clarifications of any and all data or information that is provided in accordance with the WEM Rules or this Procedure **[Clause 4.5.6]**.
- 2.6.2. AEMO must treat all information provided to it in accordance with this Procedure as confidential except where the provider has granted permission for its release or as otherwise provided under the WEM Rules. However, AEMO may release any such information as part of an unidentifiable component of an aggregate number in a Statement of Opportunities Report **[Clause 4.5.7]**.

- 2.6.3. Where any information provided to AEMO in accordance with this Procedure is insufficient for the purpose for which it is required, and AEMO has made reasonable attempts to seek clarification on the information provided, AEMO may make its own estimate and use that estimate in place of information provided in accordance with this Procedure **[Clause 4.5.8]**.

2.7. AEMO's preparation of forecasts

- 2.7.1. AEMO must prepare forecasts of the expected rate of economic growth as well as high and low economic growth forecasts.

- 2.7.2. AEMO must prepare the following forecasts of maximum electricity demand:

- (a) median peak demand assuming low demand growth;
- (b) one in ten year peak demand assuming low demand growth;
- (c) median peak demand assuming expected demand growth;
- (d) one in ten year peak demand assuming expected demand growth;
- (e) median peak demand assuming high demand growth; and
- (f) one in ten year peak demand assuming high demand growth.

The low, expected and high demand growth cases reflect demand changes stemming from the low, expected and high economic growth rates, with these being temperature adjusted to produce the one in ten year peak demand cases **[Clause 4.5.10(a)]**.

- 2.7.3. AEMO must prepare forecasts of Operational Consumption based on each of the expected, high and low economic growth rates.

- 2.7.4. To prepare the forecasts in steps 2.7.2 and 2.7.3, AEMO may use any variables it deems necessary for the efficient forecasting of electricity maximum demand and Operational Consumption. This may include, but is not limited to:

- (a) air-conditioning penetration and saturation rates;
- (b) rooftop photovoltaic (PV) installation and capacity factor rates;
- (c) battery storage installation rates;
- (d) electric vehicle growth rates;
- (e) forecasts of building approvals, new home starts etc; and
- (f) any other information, data, condition or constraint deemed necessary or appropriate in order to produce forecasts in line with industry best practices.

- 2.7.5. AEMO must determine an estimate of the Reserve Capacity required to cover the forecast cumulative needs of Intermittent Loads such that this Reserve Capacity estimate **[Clause 4.5.2A]**:

- (a) is in addition to the Reserve Capacity required to satisfy the Planning Criterion in the situation where there were no Intermittent Loads; and
- (b) must be set by AEMO to equal the sum over all expected Intermittent Loads of their forecast maximum possible Intermittent Load levels multiplied by:
 - (i) the ratio of:
 - (A) the Reserve Capacity Target for the relevant Capacity Year as described in clause 4.5.10(b)(i); and

- (B) the expected peak demand for the relevant Capacity Year as described in clause 4.5.10(b)(ii);
- (ii) minus one.

2.8. AEMO assessment of reliability

- 2.8.1. AEMO must forecast and determine the Reserve Capacity Target, which is the capacity required to meet the Planning Criterion assuming a one in ten year peak demand and expected demand growth.
- 2.8.2. The Planning Criterion to be used by AEMO in undertaking the Long Term PASA study is set out in the WEM Rules **[Clause 4.5.9]**.
- 2.8.3. The Planning Criterion requires that there should be sufficient available capacity in each Capacity Year during the Long Term PASA Planning Horizon to **[Clause 4.5.9]**:
 - (a) meet the forecast peak demand (including transmission losses and allowing for Intermittent Loads) supplied through the SWIS plus a reserve margin equal to the greater of:
 - (i) 7.6% of the forecast peak demand (including transmission losses and allowing for Intermittent Loads); and
 - (ii) the maximum capacity, measured at 41°C, of the largest generating unit; while maintaining the Minimum Frequency Keeping Capacity for normal frequency control. The forecast peak demand should be calculated to a probability level that the forecast would not be expected to be exceeded in more than one year out of ten; and
 - (b) limit expected energy shortfalls to 0.002% of annual energy consumption (including transmission losses).
- 2.8.4. AEMO is to assess the extent to which the anticipated installed generation capacity and DSM capacity is capable of satisfying the Planning Criterion and identify any capacity shortfalls in each Capacity Year in the Long Term PASA Study Horizon for each of the forecast demand scenarios in step 2.7.2 **[Clause 4.5.10(a)]**.
- 2.8.5. AEMO must:
 - (a) identify and assess any potential capacity shortfalls isolated to a sub-region of the SWIS resulting from expected restrictions on transmission capability or other factors **[Clause 4.5.10(c)]**; and
 - (b) identify any potential transmission, generation or demand side capacity augmentation options to alleviate identified capacity shortfalls **[Clause 4.5.10(d)]**.

2.9. AEMO development of the Availability Curve

- 2.9.1. AEMO is to determine the minimum capacity required to be provided by Availability Class 1 capacity for each of the second and third Capacity Years in the Long Term PASA Study Horizon, if Power System Security and Power System Reliability is to be maintained. This minimum capacity is to be set at a level such that if:
 - (a) all Availability Class 2 capacity (excluding Interruptible Load used to provide Spinning Reserve to the extent that it is anticipated to provide Certified Reserve Capacity), were activated during the Capacity Year so as to minimise the peak demand during that Capacity Year; and

- (b) the Planning Criterion and the criteria for evaluating Outage Plans set out in clause 3.18.11 of the WEM Rules were to be applied to the load scenario in step (a) above, then it would be possible to satisfy the Planning Criterion and the criteria for evaluating Outage Plans set out in clause 3.18.11 of the WEM Rules, as applied in step (b) using, to the extent that the capacity is anticipated to provide Certified Reserve Capacity, the anticipated installed Availability Class 1 capacity, the anticipated Interruptible Load capacity available as Spinning Reserve and, to the extent that further Availability Class 1 capacity would be required, an appropriate mix of Availability Class 1 capacity to make up that shortfall **[Clause 4.5.12(b)]**.
- 2.9.2. AEMO is to determine the extent that further Availability Class 1 capacity would be required to meet any shortfall identified in step 2.9.1 and determine an appropriate mix of Availability Class 1 capacity to make up that shortfall.
- 2.9.3. AEMO is to develop a two dimensional curve (“**Availability Curve**”) for each of the second and third Capacity Years of the Long Term PASA Study Horizon for the capacity associated with Availability Class 2, where this is equal to the Reserve Capacity Target for the Capacity Year less the minimum capacity required to be provided by Availability Class 1 capacity under step 2.9.1 **[Clause 4.5.10(e) and Clause 4.5.12(c)]**.

2.10. AEMO publication of the Long Term PASA

- 2.10.1. AEMO must publish the Statement of Opportunities Report for a Reserve Capacity Cycle by 5:00 pm on the first Business Day falling on or following 17 June of Year 1 of the relevant Reserve Capacity Cycle **[Clause 4.5.11 and Clause 4.1.8]**.
- 2.10.2. The Statement of Opportunities Report must include **[Clause 4.5.13]**:
- (a) the input information assembled by AEMO in performing the Long Term PASA study including, for each Capacity Year of the Long Term PASA Study Horizon:
 - (i) the demand growth scenarios used;
 - (ii) the generation capacities of each generation Registered Facility;
 - (iii) the generation capacities of each committed generation project;
 - (iv) the generation capacities of each “probable” generation project;
 - (v) the DSM capability and availability;
 - (vi) the amount of Reserve Capacity forecast to be required to serve the aggregate Intermittent Load;
 - (vii) a summary of the methodology used in determining the values and assumptions specified in (i) to (vi), including methodological changes relative to previous Statement of Opportunities Reports;
 - (b) the Reserve Capacity Target for each Capacity Year of the Long Term PASA Study Horizon;
 - (c) the amount by which the installed generation capacity plus the DSM available exceeds or falls short of the Reserve Capacity Target for each Capacity Year and each demand growth scenario considered in the study;
 - (d) the extent to which localised supply restrictions will exist while satisfying the Reserve Capacity Target for each Capacity Year and each demand growth scenario considered in the study;
 - (e) a statement of potential generation, demand side and transmission options that would alleviate capacity shortfalls relative to the Reserve Capacity Target and to capacity requirements in sub-regions of the SWIS;

- (f) the Availability Curve for the second and third Capacity Years of the Long Term PASA Study Horizon;
- (g) the quantities determined under step 2.9 for the second and third Capacity Years of the Long Term PASA Study Horizon;
- (h) the Expected DSM Dispatch Quantity for each Capacity Year in the Long Term PASA Study Horizon;
- (i) the DSM Reserve Capacity Price for the Capacity Year commencing on the next 1 October after the Statement of Opportunities Report is published;
- (j) an estimate of the DSM Reserve Capacity Price for each Capacity Year in the Long Term PASA Study Horizon; and
- (k) the DSM Activation Price for the Capacity Year commencing on the next 1 October after the Statement of Opportunities Report is published.

2.10.3. For the purposes of step 2.10.2(a)(iii) the term committed refers to Facilities that are yet to enter service, but have already received Capacity Credits for a previous Reserve Capacity Cycle.

2.10.4. For the purposes of step 2.10.2(a)(iv) the term “probable” refers to Facilities have not already received Capacity Credits for a previous Reserve Capacity Cycle, but have been granted Certified Reserve Capacity for the current Reserve Capacity Cycle.

3. CONDUCTING A REVIEW OF THE PLANNING CRITERION

3.1. Determination of whether a review should be undertaken

3.1.1. From time to time, and at least once in every five year period, the ERA must conduct a review of the Planning Criterion and the process by which AEMO forecasts SWIS peak demand [**Clause 4.5.15**].

3.1.2. The ERA must determine whether significant changes have occurred which may have impacted on the current Planning Criterion. These may include:

- (a) changes to the types or sizes of generating Facilities on the system; and
- (b) changes to the historical and future growth patterns or the characteristics of electricity demand.

3.2. Initiation of Rule Participant Support

3.2.1. The ERA may invite a number of stakeholders to participate in a Working Group.

3.2.2. The Working Group should contain representatives of:

- (a) the ERA;
- (b) AEMO;
- (c) Market Generators;
- (d) Market Customers; and
- (e) major electricity users.

3.2.3. The ERA is to publish a request for public submissions to invite persons to provide input to the review **[Clause 4.5.16]**.

3.2.4. Persons are to be invited to comment on:

- (a) the performance and suitability of the Planning Criterion;
- (b) the process by which AEMO forecasts SWIS peak demand; and
- (c) any other relevant matters.

3.2.5. The request for public submissions is to be published on the Market Web Site and in the local newspapers.

3.2.6. All submissions are to be published on the Market Web Site.

3.3. ERA preparation for Review

3.3.1. The ERA may, with input from the Working Group (if one is formed), develop the terms of reference for the review.

3.3.2. The ERA must determine whether it will undertake the review with internal resources or use independent consultants.

3.3.3. If the review is to be undertaken by an independent consultant, the ERA should seek proposals from a number of appropriately qualified persons or entities and ensure that the consultant is familiar with the methodology used to conduct the required analysis **[Clause 4.5.20(a)]**.

3.3.4. The ERA must approve any variations to the review process to be used by the independent consultant provided the variations are consistent with this Procedure and the WEM Rules **[Clause 4.5.20(b)]**.

3.3.5. If required, the appointment of any consultant must be undertaken in accordance with any ERA contracting policy and is to be based on securing the best value for money for the ERA.

3.4. ERA preparation of Draft Report

3.4.1. The ERA or its consultant must undertake a technical analysis including **[Clause 4.5.15(a)]**:

- (a) reviewing the Planning Criterion performance in the context of present and potential future load characteristics;
- (b) reviewing the criterion performance with current and potential future generation and DSM characteristics; and
- (c) reviewing any alternative criterion that may better achieve the Market Objectives.

3.4.2. The ERA with the assistance of any consultant it uses must undertake a cost-benefit study on the effects on stakeholders of retaining the existing criterion versus changing to an alternative criterion including **[Clause 4.5.15(b)]**:

- (a) estimating the costs associated with changing the criteria;
- (b) estimating the impact of changes;
- (c) estimating the value to customers of any proposed changes; and
- (d) a qualitative assessment of the impact of the alternative criterion on achieving the Market Objectives.

- 3.4.3. The ERA with the assistance of any consultant it uses must review the reliability criterion used in other relevant systems.
- 3.4.4. The ERA must publish a 'Draft Report' on the Market Web Site and invite submissions from all Rule Participants **[Clause 4.5.17]**. In inviting submissions, the ERA must specify the terms, conditions and format required. The ERA must advise all Rule Participants that the 'Draft Report' has been published.

3.5. ERA publication of Final Report

- 3.5.1. The ERA, in consultation with the Working Group (if one is formed), must collate and review all submissions received on the 'Draft Report'.
- 3.5.2. The ERA, in consultation with the Working Group (if one is formed), must prepare a 'Final Report' recommending either the retention of the existing criterion or the proposal of a new set of criteria. The 'Final Report' must include **[Clause 4.5.18]**:
 - (a) all issues identified by the ERA;
 - (b) assumptions made by the ERA in undertaking the review;
 - (c) submissions received by the ERA in the first round of consultations;
 - (d) the ERA's responses to issues raised in those submissions;
 - (e) the results of the technical and cost-benefit studies;
 - (f) submissions received by the ERA on the 'Draft Report';
 - (g) the ERA's responses to submissions on the 'Draft Report'; and
 - (h) any recommended changes to the Planning Criterion.
- 3.5.3. The ERA must include a set of draft changes to the WEM Rules and Market Procedures required to implement any recommended changes to the Planning Criterion in the 'Final Report'.
- 3.5.4. The Final Report is to include recommended changes, if any, to the processes used by AEMO in developing its electricity maximum demand and usage forecasts **[Clause 4.5.19]**.