

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

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Approved for distribution and use by:

APPROVED BY: Cameron Parrotte
TITLE: Executive General Manager (WA)

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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

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CHAPTER 1. PROCEDURE OVERVIEW

Clause 4.5.9 of the Wholesale Electricity Market Rules (Market Rules) sets out the Planning Criterion to be used by AEMO in undertaking the Long Term Projected Assessment of System Adequacy (LT PASA). The results of the LT PASA are then used by AEMO to prepare the Statement of Opportunities (SOO) Report that outlines, among other things:

- The amount of additional generation and DSM capacity required to meet the system reliability target in future years; and
- The amount of capacity that can be provided by DSM.

1.1. Relationship with the Market Rules

- (a) This Procedure has been developed in accordance with, and should be read in conjunction with section 4.5 of the Wholesale Electricity Market (WEM) Rules (Market Rules).
- (b) References to particular Market Rules within the Procedure in bold and square brackets **[MR XX]** are current as at 10 December 2016. These references are included for convenience only and are not part of this procedure.
- (c) This Procedure is made in accordance with clause 4.5.14 of the Market Rules.

1.2. Interpretation

In this procedure, unless the contrary intention is expressed:

- (a) Terms used in this procedure have the same meaning as those given in the Wholesale Electricity Market Rules (made pursuant to Electricity Industry (Wholesale Electricity Market) Regulations 2004).
- (b) To the extent that this procedure is contrary or inconsistent with the Market Rules, the Market Rules shall prevail to the extent of the inconsistency.
- (c) A reference to the Market Rules or Market Procedures includes any associated forms required or contemplated by the Market Rules or Market Procedures.
- (d) Words expressed in the singular include the plural or vice versa.

1.3. Purpose

The purpose of this procedure is:

- (a) To describe the steps that AEMO is required to undertake in preparing the LT PASA, SOO and the review under clause 4.5.15 of the Market Rules; and
- (b) To describe the steps that Rule Participants, and other parties, must follow in providing information to AEMO to assist in preparation of the LT PASA, SOO and reviews under clause 4.5.15 of the Market Rules.

1.4. Application

This procedure applies to:

- (a) AEMO in preparing the LT PASA and SOO;
- (b) Rule Participants in providing information to AEMO;
- (c) Other entities in providing information to AEMO;
- (d) The ERA in undertaking any review of the Planning Criterion;
- (e) Any third party contracted by the ERA to undertake any part of a review of the Planning Criterion; and
- (f) Stakeholders that may be part of the consultation process for reviewing the Planning Criterion and the process by which the ERA forecasts SWIS peak demand.

CHAPTER 2. UNDERTAKING THE LONG TERM PROJECTED ASSESSMENT OF SYSTEM ADEQUACY

2.1. Gathering data from Market Generators

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

2.2. Gathering data 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 in the following areas:
- (a) Expected DSM capabilities and expected MW reduction in peak consumption implemented by retailers to reduce their Individual Reserve Capacity Requirements under clause 4.28.8 (c).
 - (b) The capacity of any large loads (>10MW) 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 LT 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:
 1. 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
 2. 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) **[Clause 4.5.3A]**.

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 in the following areas **[Clause 4.5.3]**:
- (a) Expected transmission network capabilities allowing for expansion plans, losses and constraints or restrictions **[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; and
 - (d) The expected amount of capacity required to maintain normal frequency control over the LTPASA 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 Market 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 from time to time but must be for the purposes of the requirements of this Procedure and the Market 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 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 Market Rules or this Procedure and the Rule Participant must provide any clarifications as necessary.

2.6. AEMO review of data

- 2.6.1. AEMO must review the information provided to it in accordance with this Procedure and where necessary, seek clarifications **[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 these Market 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. AEMO may seek clarification of any and all data or information that is provided in accordance with the Market Rules or this Procedure.
- 2.6.4. Where any information provided to AEMO in accordance with this Procedure is insufficient for the purpose for which it is required, 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 preparation of forecasts

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

2.7.2. AEMO is to 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.

Where 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 energy sent out based on each of the expected, high and low economic growth rates.

2.7.4. In respect of procedure steps 2.7.2 and 2.7.3, AEMO may use any other conditions AEMO deems necessary for the efficient forecasting of electricity maximum demand and energy sent out. This may include, but not be limited to:

- (a) Air-conditioning penetration and saturation rates;
- (b) Forecasts of building approvals, new home starts etc; and
- (c) 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:

- (a) this Reserve Capacity estimate is in addition to the Reserve Capacity required to satisfy the Planning Criterion in the situation where there were no Intermittent Loads; and
- (b) this Reserve Capacity estimate 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 **[Clause 4.5.2A]**.

2.8. AEMO assessment of reliability

- 2.8.1. AEMO must 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 LT PASA study is set out in the Market Rules **[Clause 4.5.9]**.
- 2.8.3. The Planning Criterion is that there should be sufficient available capacity in each Capacity Year during the Long Term PASA Planning Horizon to both:
- (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:
 - (A) 8.2% of the forecast peak demand (including transmission losses and allowing for Intermittent Loads); and
 - (B) The maximum capacity, measured at 41°, 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) **[Clause 4.5.9]**.
- 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 Relevant Year in the LT PASA Study Horizon for each of the forecast demand scenarios in step 2.6.2 **[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 **[MR4.5.10(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 forecast capacity, in MW, required for more than 24 hours per year, 48 hours per year, 72 hours per year and 96 hours per year **[Clause 4.5.12(a)]**.
- 2.9.2. AEMO is to determine the minimum capacity required to be provided by generation capacity 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 DSM 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 year; and
 - (b) the Planning Criterion and the criteria for evaluating Outage Plans set out in clause 3.18.11 of the Market Rules were to be applied to the load scenario defined 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 Market Rules, as applied in step 2.9.2(b) using, to the extent that the capacity is anticipated to provide Certified Reserve Capacity, the anticipated installed generating capacity, the anticipated Interruptible Load capacity available as Spinning Reserve and, to the extent that further generation capacity would be required, an appropriate mix to generation capacity to make up that shortfall **[Clause 4.5.12(b)]**.

- 2.9.3. AEMO is to determine the extent that further generation capacity would be required to meet any shortfall identified in procedure step 2.9.2 and determine an appropriate mix of generation capacity to make up that shortfall, where the mix of generation refers to the amount in each availability class.
- 2.9.4. AEMO is to develop a two dimensional curve (“**Availability Curve**”) for each of the 2nd and 3rd Capacity Years of the Long Term PASA Study Horizon where:
- (a) The capacity quantity associated with Availability Class 4 is the Reserve Capacity Target for the Capacity Year less the greater of the quantity specified under procedure step 2.9.1 and the quantity specified under procedure step 2.9.2 as being required for more than 48 hours per year;
 - (b) The capacity quantity associated with Availability Class 3 is:
 - (i) The Reserve Capacity Target for the Capacity Year less the greater of the quantity specified under procedure step 2.9.2 and the quantity specified under procedure step 2.9.1 as being required for more than 72 hours per year; less
 - (ii) The capacity quantity associated with Availability Class 4.
 - (c) The capacity quantity associated with Availability Class 2 is:
 - (i) The Reserve Capacity Target for the Capacity Year less the greater of the quantity specified under procedure step 2.9.2 and the quantity specified under procedure step 2.9.1 as being required for more than 96 hours per year; less
 - (ii) The total capacity quantity associated with Availability Class 3 or Availability Class 4.
 - (d) The capacity quantity associated with Availability Class 1 is:
 - (i) The Reserve Capacity Target for the Capacity Year; less
 - (ii) The total capacity quantity associated with Availability Class 2, Availability Class 3 or Availability Class 4 **[Clause 2.5.12(c)]**.

2.10. AEMO publication of the LT PASA

- 2.10.1. AEMO must publish the Statement of Opportunities Report for a Reserve Capacity Cycle by the first business day on or before 1 July of Year 1 of the relevant Reserve Capacity Cycle **[Clause 4.5.11 & Clause 4.1.8]**.
- 2.10.2. The Statement of Opportunities Report must include:
- (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 Demand Side Management capability and availability;

- (vA) The amount of Reserve Capacity forecast to be required to serve the aggregate Intermittent Load;
 - (vi) 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; and
 - (f) The Availability Curve for the 2nd and 3rd Capacity Years of the Long Term PASA Study Horizon **[Clause 4.5.13]**.
- 2.10.3. For the purposes of procedure step 2.10.2(a)(iii) the term committed refers to Facilities that are yet to enter service, but have already received Capacity Credits in respect of a previous Reserve Capacity Cycle.
- 2.10.4. For the purposes of procedure step 2.10.2(a)(iv) the term “probable” refers to Facilities have not already received Capacity Credits in respect of a previous Reserve Capacity Cycle, but have been granted Certified Reserve Capacity in respect of the current Reserve Capacity Cycle.

CHAPTER 3. CONDUCTING A REVIEW OF THE PLANNING CRITERION

3.1. Determination of whether a review should be undertaken

- 3.1.1. The ERA must review the time since the last review was undertaken and, subject to procedure step 3.1.2, if this is greater than four years the ERA must initiate a review **[Clause 4.5.15]**.
- 3.1.2. The ERA must determine whether significant changes have occurred which may have significantly impacted on the current reliability criterion. These may include:
 - (a) Changes to the types or sizes of generating plant on the system; and
 - (b) Changes to the growth patterns or characteristics of electricity demand.
- 3.1.3. If significant changes have occurred the ERA must initiate a review of the Planning Criterion under clause 4.5.15 of the Market Rules.

3.2. Initiation of Rule Participant Support

- 3.2.1. The ERA may invite a number of stakeholders to participate within a Working Group.
- 3.2.2. The Working Group should contain representatives of:
 - (a) The ERA;
 - (b) AEMO (including in its capacity as System Management);
 - (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 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, develop Terms of Reference for the review.
- 3.3.2. The ERA must determine whether it will undertake the review with internal resources or utilise independent consultants.
- 3.3.3. If the review is to be undertaken by a consultant, the IMO is to seek proposals from a number of appropriately qualified persons or entities.
- 3.3.4. 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 reliability 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 the alternative criterion to better the Market Objectives.
- 3.4.2. The ERA with the assistance of any consultant it uses must undertake a cost-benefit study of retaining 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, must collate and review all submissions received on the Draft Report **[Clause 4.5.18]**.
- 3.5.2. The ERA, in consultation with the Working Group, must prepare a Final Report recommending either the retention of the exiting criterion or the proposal of a new set of criteria. The Final Report must include:
- (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 **[Clause 4.5.18]**.
- 3.5.3. The ERA must include a set of draft changes to the Market Rules and Market Procedures required to implement any recommended changes to the reliability criterion in the Final Report.
- 3.5.4. The Final Report is to include recommended changes, if any, to the processes used by the IMO in developing its electricity maximum demand and usage forecasts **[Clause 4.5.19]**.