



INDEPENDENT
MARKET
OPERATOR

Draft Rule Change Report

Title: Clarification and Calculation of Availability Curve

RC_2012_09

Standard Rule Change Process

Date 8 October 2012

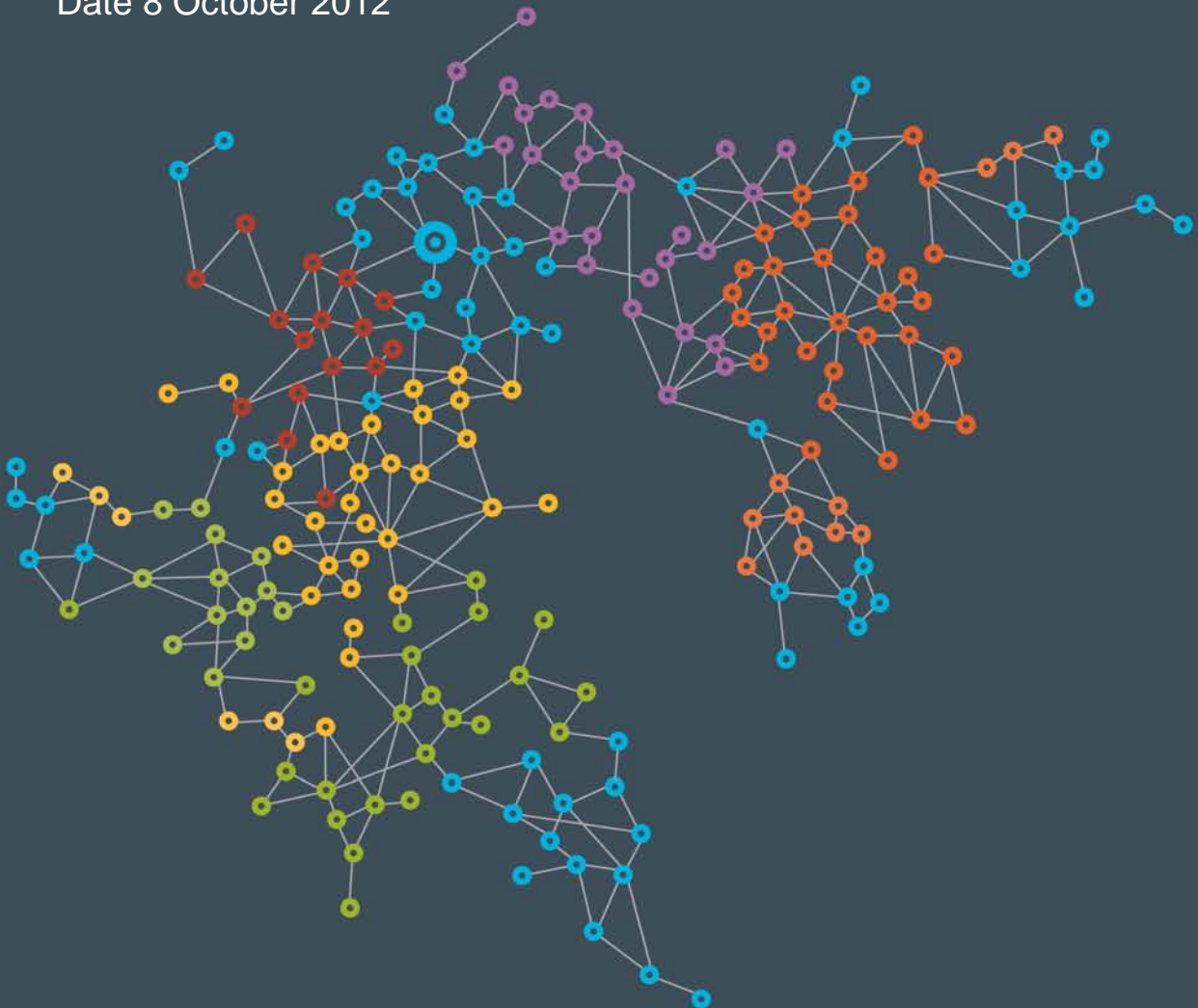


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Executive Summary

Proposed amendments

System Management submitted this Rule Change Proposal to clarify the calculation of the Availability Curve as defined in clause 4.5.10(e) of the Wholesale Electricity Market Rules. System Management considered that there is ambiguity regarding the formation of the Availability Curve which may have the potential to threaten system security. System Management proposed that the Availability Curve be defined as a duration curve of the forecast minimum capacity requirements for each Trading Interval in the Capacity Year, and that the capacity requirement for each Trading Interval be calculated as the sum of the forecast demand for that Trading Interval, the reserve margin and the Minimum Frequency Keeping Capacity.

System Management also noted that this concept had been adopted in the Availability Curve determination for the 2012 Statement of Opportunities

Consultation

The Pre-Rule Change Proposal was discussed at the Market Advisory Committee meeting on 13 June 2012, where members decided that the Rule Change should be progressed, subject to the IMO working with System Management to improve the clarity of the drafting. The Rule Change Proposal was formally submitted on 27 July 2012.

The first submission period was held between 30 July 2012 and 7 September 2012. Submissions were received from Community Electricity, Perth Energy, Synergy and Verve Energy. All parties supported the Rule Change Proposal, although Synergy questioned the use of the same reserve margin quantity for each Trading Interval in the Capacity Year. Perth Energy and Verve Energy raised two key issues with the proposal:

- confusion regarding the interaction between clauses 4.5.10(e) and 4.5.12; and
- the need to consider the scenario where the Planning Criterion was determined by the unserved energy criterion rather than the forecast peak demand criterion.

The IMO has proposed a number of additional amendments to the Amending Rules to address these issues and to improve the clarity of the relevant clauses.

Assessment against Wholesale Market Objectives

The IMO has assessed that the proposed amendments are consistent with the Wholesale Market Objectives and improve the overall integrity of the Wholesale Electricity Market Rules by clarifying the construction of and the information to be determined from the Availability Curve.

Practicality and cost of implementation

No costs or issues of practicality of implementation have been associated with this Rule Change Proposal.

The IMO's proposed decision

The IMO's proposed decision is to accept the Rule Change Proposal as modified following the first

submission period.

Next steps

The IMO now invites interested stakeholders to make submissions on this Draft Rule Change Report by **5:00 pm, Monday 5 November 2012**.

1. Rule Change Process and Timetable

On 27 July 2012 System Management submitted a Rule Change Proposal regarding amendments to clause 4.5.10(e) of the Wholesale Electricity Market Rules (Market Rules).

This proposal is being processed using the Standard Rule Change Process, described in section 2.7 of the Market Rules.

The key dates in processing this Rule Change Proposal are:



2. Call for Second Round Submissions

The IMO invites interested stakeholders to make submissions on this Draft Rule Change Report. The submission period is 20 Business Days from the publication date of this report. Submissions must be delivered to the IMO by **5.00pm, Monday 5 November 2012**.

The IMO prefers to receive submissions by email (using the submission form available on the Market Web Site: <http://www.imowa.com.au/rule-changes>) to market.development@imowa.com.au

Submissions may also be sent to the IMO by fax or post, addressed to:

Independent Market Operator

Attn: Group Manager, Market Development
PO Box 7096
Cloisters Square, PERTH, WA 6850
Fax: (08) 9254 4399

3. Proposed Amendments

3.1. The Rule Change Proposal

On 27 July 2012, System Management submitted this Rule Change Proposal to clarify the calculation of the Availability Curve as defined in clause 4.5.10(e) of the Market Rules. System Management considered that there is ambiguity regarding the formation of the Availability Curve which may have the potential to threaten system security. System Management proposed that the Availability Curve be defined as a duration curve of the forecast minimum capacity requirements for each Trading Interval in the Capacity Year, and that the capacity requirement for each Trading Interval be calculated as the sum of the forecast demand for that Trading Interval, the reserve margin and the Minimum Frequency Keeping Capacity.

System Management also noted that this concept had been adopted in the Availability Curve determination for the 2012 Statement of Opportunities (SOO).

For full details of the Rule Change Proposal please refer to the Market Web Site: http://www.imowa.com.au/rc_2012_09.

3.2. The IMO's Initial Assessment of the Rule Change Proposal

The IMO decided to progress the Rule Change Proposal on the basis that interested parties should be given an opportunity to provide submissions as part of the rule change process.

4. Consultation

4.1. The Market Advisory Committee

System Management presented the Pre Rule Change Proposal to the Market Advisory Committee (MAC) at its 13 June 2012 meeting. The following points were discussed.

- Mr Stephen MacLean queried if the 8.2% reserve margin is needed during Trading Intervals where the demand is low. There was some discussion around whether the 8.2% margin was appropriate at all times.
- MAC members agreed that there was insufficient clarity on how the Availability Curve was calculated. Mr Greg Ruthven noted that the approach presented in the Pre Rule Change Proposal was to use a capacity duration curve that allows for forecast demand plus a reserve margin. It was also noted that the current approach adopted in calculating the Availability Curve was consistent with the Market Rules. However, the proposed amendments would add clarity to the rules.
- MAC members discussed whether the proposed harmonisation of demand-side and supply-side resources arising from the work of the Reserve Capacity Mechanism Working Group (RCMWG) would have any effect on the calculation of the Availability Curve.
- MAC members considered that the wording of the proposed Amending Rules should be improved and that the proposal should be formally submitted into the Standard Rule Change Process.

Following the presentation at the MAC, the IMO and System Management collaborated to improve the drafting of the proposed amendments. Subsequently, the Rule Change Proposal was formally

submitted on 27 July 2012.

Further details are available in the MAC meeting minutes available on the Market Web Site: <http://www.imowa.com.au/MAC>

4.2. Submissions received during the first submission period

The first submission period for this Rule Change Proposal was between 30 July 2012 and 7 September 2012. Submissions were received from Community Electricity, Perth Energy, Synergy and Verve Energy.

Community Electricity supported the Rule Change Proposal because it considered that the proposed amendments removed a potential impairment of system security and imparted clarity and improvement to the current practice.

Perth Energy noted its support for the proposal on the grounds that it made the rules more transparent around how the Availability Curve is constructed. Perth Energy also observed that this issue was related to the issues discussed in the Rule Change Proposal: Calculation of Availability Class Quantity Correction (RC_2011_14). Perth Energy also considered that the approach for calculating the Availability Curve as presented by System Management in the Rule Change Proposal was sensible and consistent with the existing practice. However, Perth Energy raised some concerns about the interaction between clause 4.5.10(e) and clause 4.5.12, noting that it was unclear if the proposed amendments were intended to replace the information contained in the Availability Curve as defined in clause 4.5.12. These issues have been discussed further in Section 4.3 of this report.

Synergy supported the Rule Change Proposal on the grounds that it clarified the requirement for the Availability Curve to define the capacity requirement for each Trading Interval in a Capacity Year. However, Synergy raised some concerns about whether using the same reserve margin component for every Trading Interval could overstate the capacity requirement for most Trading Intervals. These concerns have been addressed in Section 4.3.

Verve Energy supported the Rule Change Proposal but noted that the proposed amendments as drafted in clause 4.5.10(e)(ii) only account for the scenario where the Reserve Capacity Requirement is determined by forecast peak demand plus reserve margin (clause 4.5.9(a)) element of the Planning Criterion. Verve Energy further noted that the Draft Report of the 5-year Review of the Planning Criterion recommended that the expected unserved energy component of the Planning Criterion be removed. However, Verve Energy considered that while the recommendations from the 5-year review process are still in draft stage, the Availability Curve calculation should still satisfy the unserved energy element of the Planning Criterion.

Verve Energy also noted the issue regarding the interaction between clauses 4.5.10(e) and 4.5.12. Verve Energy also identified a number of minor issues with the drafting for further consideration. These issues have been discussed in Section 4.3.

The assessment against Wholesale Market Objectives, provided in submissions is detailed below:

Submitter	Assessment against Wholesale Market Objectives
Community Electricity	Better achieves Wholesale Market Objective (a) and is consistent with the other Wholesale Market Objectives.
Perth Energy	Better achieves Wholesale Market Objective (a) and has no impact on the other Wholesale Market Objectives.
Synergy	Better achieves Wholesale Market Objective (a).
Verve Energy	Better achieves Wholesale Market Objective (a).

A copy of all submissions in full received during the first submission period is available on the Market Web Site: http://www.imowa.com.au/rc_2012_09.

4.3. The IMO's response to submissions received during the first submission period

The IMO's response to the two key issues raised by Perth Energy and Verve Energy are detailed below:

- Issue 1: Confusion regarding the interaction between clauses 4.5.10(e) and 4.5.12

The IMO notes that some inconsistency exists in the current Market Rules around the use of the term "Availability Curve". Clause 4.5.10(e) describes an Availability Curve as a "two dimensional curve" for a Capacity Year "describing the information referred to in clause 4.5.12". Clause 4.5.12 states that an Availability Curve is to contain a number of different MW quantities, including:

- (a) the forecast capacity required for more than 24 hours per year, 48 hours per year and 72 hours per year;
- (b) the minimum capacity required to be provided by generation capacity if Power System Security and Power System Reliability is to be maintained; and
- (c) the capacity quantities to be associated with each of the four Availability Classes.

If an Availability Curve is a duration curve of the forecast minimum capacity requirements over a Capacity Year (as suggested in the Rule Change Proposal), then the quantities described in (a) can be determined directly from the curve. This is not the case, however, for the quantities described in (b) and (c). The determination of (b) requires complex modelling involving a range of different inputs, while the (c) quantities are calculated from (a) and (b) quantities and the Reserve Capacity Target. The IMO considers that the concept of these quantities being "contained" in a two dimensional Availability Curve is misleading and unlikely to provide any value to a reader of the clause.

The IMO notes that the 2012 SOO applied the label Availability Curve to the (c) quantities (although as mentioned previously the methodology used was consistent with this Rule

Change Proposal). After further consideration, the IMO considers that this is not the most appropriate approach, as once the (c) quantities have been calculated there is little value in associating them with a two dimensional curve. The IMO has therefore proposed a number of additional amendments to the proposed Amending Rules to clarify that:

- i. the Availability Curve is a duration curve of the forecast minimum capacity requirements over a Capacity Year; and
 - ii. the quantities described in clause 4.5.12 are determined for each Capacity Year, with only the (a) quantities being determined directly from the Availability Curve.
- Issue 2: Both scenarios of the Planning Criterion need to be accounted for in the Availability Curve

The IMO's 2012 SOO noted that "the Availability Curve ensures that there is sufficient capacity at all times to satisfy both elements of the Planning Criterion (10% PoE peak demand + reserve margin and 0.002% Unserved Energy), as well as ensuring that sufficient capacity is available to satisfy the criteria for evaluating Outage Plans." While the SOO states that the Availability Curve ensures that there is sufficient capacity to satisfy both elements of the Planning Criterion, Verve Energy noted that the proposed Amending Rules did not account for scenarios where the unserved energy component determined the Reserve Capacity Requirement.

The IMO agrees that the proposed amendments do not account for scenarios in which the unserved energy component of the Planning Criterion defines the Reserve Capacity Requirement. In scenarios where the quantity in clause 4.5.9(b) (unserved energy) is greater than the quantity in clause 4.5.9(a) (forecast peak demand plus reserve margin), the proposed amendments to clause 4.5.10(e) would result in an incorrect minimum capacity requirement. To account for both the scenarios as defined in clause 4.5.9(a) and (b), the IMO has proposed further amendments to clause 4.5.10(e).

The IMO's responses to other issues identified during the first submission period are presented in the table over the page:

	Submitter	Comment/Change requested	IMO Response
1	Perth Energy	Perth Energy queries how the proposed amendments to clause 4.5.10 (e) will interact with the existing clause 4.5.12. The proposed amendments have removed any reference to clause 4.5.12 which specifies the information that must be contained in the Availability Curve. Clause 4.5.12 seems to become a stand-alone clause without the Market Rules placing any obligation to construct the curve.	The IMO notes that an “Availability Curve” is defined in the Glossary as “a curve developed by the IMO under clause 4.5.10(e)”. The IMO therefore considers that the reference in clause 4.5.12 to an Availability Curve clearly refers to a curve developed by the IMO under clause 4.5.10(e). However, to clarify this relationship further, the IMO has proposed a minor change (retaining the term “Availability Curve” in clause 4.5.10(e)) to the proposed Amending Rules.
2	Perth Energy	Perth Energy notes that the Rule Change Proposal did not propose to amend the definition of Availability Curve in the Glossary. The current definition references clause 4.5.10 (e). However, the referencing to clause 4.5.12, which contains the concept of an Availability Curve has been removed.	The IMO notes this concern and considers that the definition of Availability Curve in the Glossary does not need to be amended as the reference to clause 4.5.10(e) is appropriate.
3	Perth Energy	Perth Energy proposes that the term “duration curve” that appears in the proposed amendments be explicitly defined as “a curve representing the MW forecast minimum capacity requirement for each Trading Interval during the Capacity Year sorted by value with the highest MW forecast appearing first, followed by the second highest MW forecast and so on finishing with the lowest MW forecast.”	The IMO notes this suggestion but considers that a duration curve is a widely used generally well understood concept. Further, the IMO considers that the definition of the duration curve (Availability Curve) is clarified in the proposed amendments to clause 4.5.10 (e) itself.
4	Synergy	Synergy notes that clause 4.5.10(b) defines a single point value for a Capacity Year, based on the forecast one in ten year peak demand and the associated reserve margin, whereas the Rule Change Proposal seeks to define the Availability Curve for each and every Trading Interval applying the same single point reserve margin value. Given this context and informal discussions with System	The IMO notes that only the first 144 Trading Intervals in the Availability Curve (corresponding to the 72 hours with the greatest capacity requirements) directly impact the quantities determined by the IMO under clause 4.5.12. However, the IMO considers that this may be subject to change in the future, for example as a result of harmonisation changes arising from the RCMWG. The IMO does not consider it necessary or useful to explicitly state a “limit” to the number of Trading

	Submitter	Comment/Change requested	IMO Response
		Management, Synergy notes that System Management's intention is to only use the peak 192 and not all 17520 Trading Intervals. This limit to the number of Trading Intervals must be explicitly stated.	<p>Intervals used in the Market Rules.</p> <p>System Management, in discussions with the IMO and in its Rule Change Proposal, has clearly indicated that it considers the full reserve margin should be included in the capacity requirement calculation for each Trading Interval in a Capacity Year. The use of the reserve margin as stipulated in clause 4.5.9(a), while conservative, is a simple approach that provides a reasonable estimate of the contingency requirement.</p> <p>The IMO also observes that the Market Rules place the obligation of constructing the Availability Curve on the IMO, not System Management.</p>
5	Synergy	Synergy notes that demand ranked TI 192 will have a significantly lower demand than the highest demand TI, by applying the same single point value to all 192 TI's will overstate the need for the majority of the selected TI's. In light of this, Synergy suggests considering the size of the largest generator as the contingency value	The IMO considers that Synergy's suggestion would result in an understatement of the capacity requirement for the key Trading Intervals in the Availability Curve (currently the first 72 hours). The IMO does not consider that a more elaborate calculation is justified given the way in which the Availability Curve is used under the Market Rules.
6	Verve Energy	The proposed drafting of clause 4.5.10(e) removes the reference to the term "Availability Curve". For clarity, Verve Energy considers that the reference to the term be reinstated.	See response to Issue 1
7	Verve Energy	In recent Rule Changes the IMO has moved towards amending the Market Rules to be principles-based rather than prescriptive, moving prescriptive detail into the Market Procedure. Verve Energy considers that some of the detail outlined in the Rule Change Proposal may have been more appropriately contained in the Market Procedure.	The IMO considers that the proposed amendments to clause 4.5.10(e) outline the key components to be included in the calculation of the capacity requirement for each Trading Interval, but do not extend to the prescriptive details of exactly how these quantities are determined. As such the IMO considers it appropriate for these components to be included in the Market Rules rather than the Market Procedure.
8	Verve Energy	For clarity and consistency in drafting, Verve Energy considers that proposed sub clause 4.5.10(e)(ii)	The IMO's proposed further amendments have rendered the inclusion of

	Submitter	Comment/Change requested	IMO Response
		could refer to clause 3.10.1(a) of the Market Rules (where the Minimum Frequency Keeping Capacity requirement is outlined).	Minimum Frequency Keeping Capacity unnecessary.

4.4. Public Forums and Workshops

No public forums and workshops were held with regard to this proposal.

5. The IMO's Assessment

In preparing its Draft Rule Change Report, the IMO must assess the Rule Change Proposal in light of clauses 2.4.2 and 2.4.3 of the Market Rules.

Clause 2.4.2 outlines that the IMO *“must not make Amending Rules unless it is satisfied that the Market Rules, as proposed to be amended or replaced, are consistent with the Wholesale Market Objectives”*.

Additionally, clause 2.4.3 states, when deciding whether to make Amending Rules, the IMO must have regard to the following:

- any applicable policy direction from the Minister regarding the development of the market;
- the practicality and cost of implementing the proposal;
- the views expressed in submissions and by the MAC; and
- any technical studies that the IMO considers necessary to assist in assessing the Rule Change Proposal.

The IMO notes that there has not been any applicable policy direction from the Minister or any technical studies commissioned in respect of this Rule Change Proposal. A summary of the views expressed in submissions and by the MAC is available in section 4 of this report.

The IMO's assessment is outlined in the following sub-sections.

5.1. Additional Amendments to the proposed Amending Rules

Following the first public submission period the IMO has made some additional changes to the proposed Amending Rules to:

- Include the term Availability Curve in clause 4.5.10(e);
- Account for both scenarios defined in the Planning Criterion in clause 4.5.9;
- Clarify the information to be determined from the Availability Curve in clause 4.5.12;
- Include the information resulting from proposed amendments to clause 4.5.12 in clause 4.5.13; and
- Incorporate a number of minor and typographical amendments to improve the overall integrity of the Amending Rules.

The changes the IMO made to the Amending Rules presented in the Rule Change Proposal are outlined in detail in Appendix 1 of this Draft Rule Change Report.

5.2. Wholesale Market Objectives

The IMO considers that the Market Rules as a whole, if amended as presented in section 5.1, will be consistent with the Wholesale Market Objectives.

The IMO considers that the proposed amendments will provide greater clarity around the construction of and the information to be determined from the Availability Curve. The IMO considers that this will improve the overall integrity of the Market Rules.

5.3. Practicality and cost of implementation

5.3.1. Cost:

No costs associated with implementing the proposed changes have been identified.

5.3.2. Practicality:

The IMO does not consider that there are any issues with the practicality of implementing the proposed changes.

6. The IMO's Proposed Decision

The IMO's proposed decision is to accept the Rule Change Proposal as modified by the amendments outlined in section 5.1 and as specified in the Rule Change Notice and Proposal.

6.1. Reasons for the decision

The IMO made its proposed decision on the basis that the Amending Rules:

- are consistent with the Wholesale Market Objectives;
- improve the overall integrity of the Market Rules;
- have the general support of the MAC; and
- have the general support of submissions received during the first submission period.

6.2. Proposed Commencement details

The Amending Rules are proposed to commence at 8:00 AM on 1 January 2013.

7. Proposed Amending Rules

4.5.10. The IMO must use the information assembled to:

...

- (e) develop a two dimensional duration curve of the forecast minimum capacity requirements over the Capacity Year ("Availability Curve") for each of the second 2nd and third 3rd Capacity Years of the Long Term PASA Study Horizon describing the information referred to in clause 4.5.12 ("Availability Curve"). The forecast minimum capacity requirement for each Trading Interval in the Capacity Year must be determined as the sum of:
 - i. the forecast demand (including transmission losses and allowing for Intermittent Loads) for that Trading Interval under the scenario described in clause 4.5.10(a)(iv); and
 - ii. the difference between the Reserve Capacity Target for the Capacity Year and the maximum of the quantities determined under clause 4.5.10(e)(i) for the Trading Intervals in the Capacity Year.

4.5.12. For the second and third Capacity Years of the Long Term PASA Study Horizon, the IMO must determine the following information. An Availability Curve for a Capacity Year is to contain the following information:

- (a) the forecast capacity, in MW, required for more than 24 hours per year, 48 hours per year and 72 hours per year, determined from the Availability Curve for the Capacity Year developed under clause 4.5.10(e);

...

- (c) the capacity associated with each Availability Class where:

...

- iv. the capacity quantity associated with Availability Class 1 is:
 - 1. the Reserve Capacity Target for the Capacity Year; less
 - 2. the sum of the capacity quantities associated with each of Availability Class 2, Availability Class 3 and Availability Class 4;

4.5.13. The Statement of Opportunities Report must include:

...

- (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 second-2nd and third-3rd Capacity Years of the Long Term PASA Study Horizon; and
- (g) the quantities determined under clause 4.5.12 for the second and third Capacity Years of the Long Term PASA Study Horizon.

Appendix 1 Further Amendments to the Proposed Amending Rules

The IMO has made some amendments to the Amending Rules following the first submission period. These changes are as follows (~~deleted text~~, added text):

4.5.10. The IMO must use the information assembled to:

...

- (e) develop a two dimensional duration curve of the forecast minimum capacity requirements over the Capacity Year ("Availability Curve") for each of the second and third Capacity Years of the Long Term PASA Study Horizon. The forecast minimum capacity requirement for each Trading Interval in the Capacity Year must be determined as the sum of:
 - i. ~~the~~ forecast demand (including transmission losses and allowing for Intermittent Loads) for that Trading Interval under the scenario described in clause 4.5.10(a)(iv); and
 - ii. the difference between the Reserve Capacity Target for the Capacity Year and the maximum of the quantities determined under clause 4.5.10(e)(i) for the Trading Intervals in the Capacity Year.
 - ~~ii. The reserve margin for the Capacity Year described in clause 4.5.9(a); and~~
 - ~~iii. The forecast Minimum Frequency Keeping Capacity for the Capacity Year.~~

4.5.12. For the second and third Capacity Years of the Long Term PASA Study Horizon, the IMO must determine the following information~~An Availability Curve for a Capacity Year is to contain the following information:~~

- (a) the forecast capacity, in MW, required for more than 24 hours per year, 48 hours per year and 72 hours per year, determined from the Availability Curve for the Capacity Year developed under clause 4.5.10(e);

...

- (c) the capacity associated with each Availability Class where:

...

- iv. the capacity quantity associated with Availability Class 1 is:
 - 1. the Reserve Capacity Target for the Capacity Year; less
 - 2. the sum of the capacity quantities associated with each of Availability Class 2, Availability Class 3 and Availability Class 4;

4.5.13. The Statement of Opportunities Report must include:

...

- (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 second ~~2nd~~ and third ~~3rd~~ Capacity Years of the Long Term PASA Study Horizon; and
- (g) the quantities determined under clause 4.5.12 for the second and third Capacity Years of the Long Term PASA Study Horizon.