EXTENSION OF TIMEFRAME FOR PREPARING THE FINAL RULE CHANGE REPORT UNDER CLAUSE 2.5.12 OF THE MARKET RULES FOR RC_2010_25 & RC_2010_37 AND FURTHER CONSULTATION ON THE RULE CHANGE PROPOSALS

In accordance with clause 2.5.10 of the Market Rules, the Independent Market Operator (IMO) has extended the timeframe for preparing the Final Rule Change Report for the Rule Change Proposals titled:

- "Calculation of the Capacity Value of Intermittent Generation – Methodology 1 (IMO)" (Ref: RC_2010_25); and
- "Calculation of the Capacity Value of Intermittent Generation – Methodology 2 (Griffin Energy) (Ref: RC_2010_37).

The end date for preparing the Final Rule Change Report for these two Rule Change Proposals is extended until **Tuesday 20 December 2011**. Dates for subsequent steps of the rule change process have been adjusted accordingly.

Reason for the extension and further consultation period

Three important issues relating to the application of modified Methodology 1 (as presented in the Draft Rule Change Report) were raised in or arise from second-round submissions on RC_2010_25 and RC_2010_37. The IMO considers that these issues warrant further consideration by interested parties. Further details of the issues and the IMO's proposed solutions are outlined below.

The IMO considers it appropriate to allow interested parties a further opportunity to:

- consider the issues raised; and
- make further submissions on the IMO's proposed solutions to these issues (including the proposed revised Amending Rules, as set out in Appendix 3).

The IMO acknowledges that clause 2.7 of the Market Rules does not specifically contemplate a further consultation period after second-round submissions on the Draft Rule Change Report. However, given the importance of the issues raised and their potential impact on the IMO's assessment of the Rule Change Proposals, the IMO has determined that a further period of consultation is appropriate in this case.

Any submissions must be delivered to the IMO by 5:00pm on **Wednesday 30 November 2011**.

Issues

Issue 1: U-factor Adjustment

Uncertainty over size of U-factor adjustment: A number of submissions received during the second submission period suggested that the U-factor adjustment would add to uncertainty as to the Capacity Credits that applicants would receive. The IMO acknowledges that this could be the case. However, even without the U-factor adjustment there would still be uncertainty and concern as to the performance during peak times and therefore the actual capacity value of Intermittent Generators. The U-factor adjustment responds to this uncertainty, on the basis of current information. The IMO also notes that the size of the U-factor adjustment can be estimated by applying the formula using estimates of the variance and average of Facility output during peaks.

However, the IMO recognises that under the current structure there is no limit to the adjustment that may be applied, which leads to the risk that the U-factor adjustment could be excessive for a Facility. The IMO also recognises that it is desirable to reduce uncertainty, wherever possible.

For these reasons, the IMO proposes to set a cap on the U-factor adjustment at one-third of the Facility's average output at peak times. This is a level that would not affect the Facilities included in the IMO's analysis but may help to mitigate concerns as to the effect of the U-factor adjustment.

Transparency regarding the determination of the adjustment parameters: A number of submissions received during the second submission period also suggested that the determination of the adjustment parameters for the U-factor was insufficiently transparent. To address this concern the IMO requested Dr Richard Tooth from Sapere Research Group (Sapere) to provide further details of the basis on which he derived the adjustment parameters. These details are set out in Appendix 1. The IMO recognises that while this clarification should go some way towards addressing the concerns raised during second round submissions, an element of judgement was needed by Dr Tooth in setting an appropriate value for the U-factor for each of the three years.

Issue 2: Impact of Demand Side Management on peak periods

In response to an issue raised during the second submission period, the IMO has considered the inclusion of the impact of Demand Side Management (DSM) (and Interruptible Loads and involuntary load shedding) on the signals provided by Load for Scheduled Generation (LSG). Consistent with the original intention of the LSG concept, to reflect the peak when additional capacity is most needed, curtailment of demand on either a voluntary or involuntary basis is likely to be aligned with peak Trading Intervals. For example, a contingency event such as restricted gas supply on a hot day would potentially reduce the output of the Scheduled Generation fleet, making it highly likely that DSM will be dispatched by System Management that

Interruptible Loads will be automatically tripped off and that involuntary load shedding will occur[1].

The IMO considers that the current definition of LSG as provided in the Draft Rule Change Report (determined as total sent out generation minus total intermittent generation) could fail to consider similar types of contingency events, as it did not incorporate load reduction events into the determination of the 12 peak Trading Intervals. The IMO considers that incorporating these events would better reflect the times where additional capacity from wind farms is most needed and are likely to be aligned with a 1-in-10-year event.

The IMO has investigated the impacts of amending the definition of LSG to include load reductions (voluntary and involuntary) on the 12 peak LSG Trading Intervals. An overview of the outcomes is presented below:

- The inclusion of DSM curtailment data changes the timing of the peak loads. This change has a small but material positive impact on the Capacity Credit value for existing wind farm Facilities (for other Facilities, i.e. landfill gas, the impact appears negligible). This appears to have been because curtailment during the 2011 DSM curtailment events occurred during the peak afternoon period on 24, 25, 26 and 28 February which pushed peak LSG to early periods when wind output was lower. The 2008 curtailment event only impacted on one peak LSG Trading Interval and had a negligible overall impact.

- The inclusion of involuntary load shedding data has no impact on the peak LSG periods.

Note that the impacts of Interruptible Loads tripping off the system in response to system frequency changes has not been assessed, as the corresponding reduction in MWh energy as a result of these events is not currently available to the IMO. The IMO has suggested proposed amendments into the Amending Rules to ensure that this information would be available for the purposes of determining the LSG periods (refer to Appendix 3). The IMO is currently discussing these arrangements further with System Management, with a view to ascertaining a process for the provision of this information in the event the proposed amendment was made.

A copy of the revised LSG periods to reflect the proposed amended determination of peak periods is set out in Appendix 2.

Issue 3: Impact of existing Facilities on new Facilities through use of LSG

A number of submissions raised concerns about the impact that new Facilities would have on the measurement of LSG, which in turn impacts on existing Facilities. In particular submitting parties were concerned that estimated data provided by an

[1] The IMO notes that Dispatchable Loads would also likely be dispatched either upwards or downwards during such an event. However due to acknowledged issues relating to Dispatchable Loads through out the Market Rules the IMO is not considering incorporating these loads into the determination of the peaks but rather may consider their inclusion at a later date when the issues relating to Dispatchable Loads are specifically addressed in the Market Rules.

accredited expert report and used for the purposes of determining the level of Certified Reserve Capacity for a new Facility would affect the Capacity Credit valuations of existing Facilities.

The IMO agrees that it is inappropriate that estimated data, being used for Facilities that are yet to enter service or re-enter services after significant maintenance or having been upgraded[2], should affect impact the historical calculation of LSG for existing Facilities.

In response, the IMO proposes that modified Methodology 1 be amended such that the value of LSG would be calculated for the fleet of existing Intermittent Generators only on the basis of actual metered data. As a result, historical calculations of LSG would not change when new Intermittent Generators or upgrades to existing Facilities are certified. Furthermore, as a 5 year period is proposed to be used to determine output used in the LSG formula, any future impact arising from changes in LSG from a new Facility (or upgrade) on existing Facilities would occur gradually as actual generation data becomes available. Given LSG for existing Facilities would be based entirely on metered data the IMO would be able to publish this information on 1 July rather than 1 August of the relevant Reserve Capacity Cycle. This would allow existing Facilities to consider this information prior to the closure of certification applications on 1 June.

For new and upgraded Facilities, the process would remain whereby the estimated output will be used to calculate the peak LSG Trading Intervals for only that Facility. The LSG used for a new Facility would be determined using the total output of the existing Intermittent Generator fleet plus the Facility's estimated output. The LSG used for an upgraded Facility would be determined using the total output of the existing Intermittent Generator fleet, adjusted to reflect the estimated output of the Facility under its new component configuration wherever the actual metered data for the Facility is either missing or else pre-dates the fully operational date for the Facility [3]. Where multiple new or upgraded Intermittent Generators are entering the market, separate individual LSG values would be determined, thereby ensuring the impact of estimated data for any one Facility does not impact of the certification level of another new, upgraded or existing Facility.

The IMO considers that this proposed approach to treating new entrant and upgraded Facilities would be appropriate to provide the right incentives for investment at the time when capacity is most valuable. The estimated data would be replaced by the metered results over a 5 year period once the Facility becomes fully operational in the market. Note that Facilities that are currently fully operational but which do not have metered results (relevant to the current component configuration of the Facility) over a 5 year period would be required to provide the IMO with an expert report containing estimated output for those missing Trading Intervals. This will be the case regardless of whether the additional proposed amendments are made.

---

[2] The IMO notes it would not also be inappropriate to use metered output for facilities that have changed their configuration during the five years as this would not reflect their ability to contribute during peak periods in the future.

[3] The IMO notes that such a treatment of an upgraded Facility as a whole for the purposes of the calculation (rather than simply considering the upgrade separately) would be consistent with the approach taken for the return of Reserve Capacity Security.

Proposed revised Amending Rules

To assist interested parties in making their submissions on these three issues and the IMO's proposed solutions, the IMO has updated the proposed Amending Rules presented in the Draft Rule Change Report. A copy of the proposed revised Amending Rules is presented in Appendix 3 of this report.

Proposed Work Programme

- Interested parties make submissions on the three issues and proposed solutions presented in this notice.
- The IMO will prepare its Final Rule Change Report, taking into account the views expressed in any relevant submissions received.
- The IMO Board presents its final decision regarding RC_2010_25 and RC_2010_37 in the Final Rule Change Report.

SUZANNE FRAME
GROUP MANAGER, MARKET DEVELOPMENT

21 November 2011

APPENDIX 1: THE ESTIMATION OF THE U-FACTOR ADJUSTMENT – ADDITIONAL COMMENTS BY DR RICHARD TOOTH, SAPERE RESEARCH GROUP

There was, in my view, a clear requirement for some adjustment for the additional risk that the Intermittent Generator output observed was not representative of what would occur at extreme peaks. In forming this view I noted that:

- peak demand was likely to occur on a very hot day; and
- Intermittent Generator output on the very hot days tended to be lower than the average output during the top-12 peak Trading Intervals.

In determining the size of the adjustment, I considered a number of different approaches. I considered that it was not practical, or preferable, to simply apply a formula on a reduced set of Trading Intervals that would represent the extreme peaks. Two issues with this approach are that:

- a focus on observed results may still not be representative of the actual results that would be obtained during extreme peaks; some consideration of the pattern of output was appropriate; and
- there is a very limited amount of data points.

A possible approach was to develop a forecast of the output of Facilities based on the observed data coupled with a set of environmental variables that might be used to forecast peak demand. Such an analysis would however be time consuming and expensive to undertake and would require collection of additional data

The alternative approach selected was to develop a best-efforts estimate based on available information. Such an approach was attractive given that:

- it could be done quickly;
- it would be unbiased; and
- there is a transition period and three year review.

The key principle in determining the size of the adjustment was to provide a Capacity Credits result that was a best-efforts estimate of the true capacity value. The adjustment selected was to provide a result that, in my view, should leave participants indifferent between using the best-efforts estimate and a refined estimate using a more detailed analysis. Broadly this was to match a result where there was an equal chance of being above and below the value of capacity provided by the fleet should the full information be available.

The best-efforts estimate was based on a number of factors, but most significantly from a close examination of how the Intermittent Generation fleet performed during extreme peaks. Note the analysis was not based on the average Intermittent Generation output at peak LSG or peak operational load but rather on how much the Intermittent Generators reduced the peak load that is left to be met by other generators – this amount will always be between the average output as measured at peak LSG and peak operational load (see Sapere Report, Box 3 on page 14).

As noted in the Sapere Report, the average output of the Intermittent Generation fleet during the top 12 Trading Intervals on separate days was (for the period analysed) around 80 MW (measured using LSG). However, the average reduction in peak due to the fleet output was (see Sapere Report, page 18):

- 71 MW for days with temperature ≥39 degrees,
- 67 MW for days with temperature ≥40 degrees, and
- 51 MW for days with temperature ≥41 degree,

where temperature was measured at 3pm on the day.

Further analysis was undertaken examining the sensitivity of such results to changes in how temperature was measured (e.g. at what times of the day were temperatures measured, including an average of the minimum and maximum temperature). In all cases a similar pattern emerged. In developing an estimate a number of factors (discussed below) were considered. Based on a visual inspection of the data, coupled with consideration of other factors, in my view a total fleet output around the low-60 MWs (i.e. in the range between 60 MW and 65 MW) was appropriate.

The specific result of 63 MW was selected as it coincided with:

- the average of the above results (i.e. the average of 71, 67, 51 averages noted above, which is, in effect, a weighted average of results for days with temperature ≥39 degrees).
- the results obtained from applying the original RC_2010_25 proposal modified to select Trading Intervals from separate days (i.e. the 95% PoE of yearly average fleet output of top 12 Trading Intervals taken from separate days over the years available).

In developing this best-estimate there were a number of additional considerations.

A possible range was developed. In my view, a possible range was determined by:

- an upper bound of the fleet average of 71 MW for days with temperatures ≥39 degrees; and
- a lower bound of the minimum recorded during the very hot days of 36 MW.

Of note, the results obtained under the original RC_2010_25 or the RC_2010_37 both fell outside of this range.

The observed negative relationship between air temperature and output was an important consideration. In particular it was considered that due to the negative trend observed, the true capacity value may even be smaller than the average output shown. However it was also recognised that:

- air temperature is just one factor that might affect both supply and demand;
- at the very highest temperatures there appeared to be no correlation between demand and IGF output; and
- there was a reasonable diversity of Facilities which would reduce the likelihood that the true value would be too low.

The limited number of data points was a consideration. The greater the temperature, the fewer the number of the observations recorded that could be used. With this in mind it was recognised that:

- the results would be sensitive to the days that are selected (To mitigate this risk a number of different analyses were undertaken); and
- although there was a clear negative trend between average output and temperature in the observed data, this relationship might not be observed once further data is accumulated.

APPENDIX 2: REVISED 12 PEAK LOAD FOR SCHEDULED GENERATION TRADING INTERVALS DURING PAST 5 YEARS

Trading Interval	Trading Day
25/01/2007 14:30	25/01/2007
27/01/2007 16:30	27/01/2007
28/01/2007 16:00	28/01/2007
29/01/2007 12:00	29/01/2007
2/02/2007 15:30	2/02/2007
3/02/2007 14:00	3/02/2007
7/02/2007 15:00	7/02/2007
6/03/2007 15:30	6/03/2007
7/03/2007 15:30	7/03/2007
8/03/2007 15:00	8/03/2007
19/03/2007 15:00	19/03/2007
20/03/2007 15:00	20/03/2007
17/01/2008 15:00	17/01/2008
24/01/2008 14:30	24/01/2008
25/01/2008 15:30	25/01/2008
4/02/2008 15:30	4/02/2008
5/02/2008 15:30	5/02/2008
6/02/2008 15:30	6/02/2008
11/02/2008 15:30	11/02/2008
12/02/2008 16:30	12/02/2008
13/02/2008 16:30	13/02/2008
26/02/2008 15:30	26/02/2008
27/02/2008 16:00	27/02/2008
28/02/2008 15:30	28/02/2008
5/01/2009 13:30	5/01/2009
8/01/2009 15:30	8/01/2009
9/01/2009 15:00	9/01/2009
15/01/2009 15:30	15/01/2009
16/01/2009 14:30	16/01/2009
2/02/2009 13:00	2/02/2009
3/02/2009 15:00	3/02/2009
10/02/2009 15:30	10/02/2009
11/02/2009 15:30	11/02/2009
12/02/2009 11:30	12/02/2009
20/02/2009 15:30	20/02/2009
10/03/2009 15:30	10/03/2009
4/01/2010 16:30	4/01/2010
18/01/2010 14:00	18/01/2010

Trading Interval	Trading Day
19/01/2010 15:00	19/01/2010
28/01/2010 15:30	28/01/2010
29/01/2010 15:30	29/01/2010
24/02/2010 16:30	24/02/2010
25/02/2010 16:00	25/02/2010
26/02/2010 16:30	26/02/2010
1/03/2010 17:30	1/03/2010
2/03/2010 15:30	2/03/2010
11/03/2010 16:00	11/03/2010
12/03/2010 16:00	12/03/2010
4/01/2011 15:00	4/01/2011
28/01/2011 13:00	28/01/2011
15/02/2011 16:30	15/02/2011
16/02/2011 16:00	16/02/2011
21/02/2011 16:30	21/02/2011
22/02/2011 16:30	22/02/2011
23/02/2011 16:30	23/02/2011
24/02/2011 16:30	24/02/2011
25/02/2011 16:30	25/02/2011
26/02/2011 12:30	26/02/2011
28/02/2011 14:00	28/02/2011
1/03/2011 16:30	1/03/2011

APPENDIX 3: PROPOSED REVISED AMENDING RULES

To assist interested parties in preparing their submissions on the IMO's proposed solutions to the three issues outlined in this notice, the IMO has prepared the following revised proposed Amending Rules. The IMO notes that the majority of amendments clarify the treatment of upgraded Facilities in the Amending Rules.

The IMO notes that these amendments are purely indicative at this time, have not been approved by the IMO Board and may be subject to change in the Final Rule Change Report.

The amendments to the proposed Amending Rules are marked up from those originally presented in the Draft Rule Change Report and are as follows (added text, ~~deleted text~~):

4.10.1. Each Market Participant must ensure that information submitted to the IMO with an application for certification of Reserve Capacity pertains to the Reserve Capacity Cycle to which the certification relates, is supported by documented evidence and includes, where applicable, the following information:

…

(i) whether the applicant wishes to nominate the use of the methodology described in clause 4.11.2(b), in place of that described in clause 4.11.1(a), in assigning the Certified Reserve Capacity or Conditional Certified Reserve Capacity to apply to a Scheduled Generator or a Non-Scheduled Generator; ~~and~~

(j) whether the Facility will be subject to a Network Control Service contract~~.~~; and

(k) where an applicant nominates to use the methodology described in clause 4.11.2(b) and the Facility is already in full operation under the component configuration description (as outlined in clause 4.10.1(dA), the date on which the Facility became fully operational under the component configuration description, unless this date has already been provided to the IMO in a previous application for certification of Reserve Capacity.

4.10.3. An application for certification of Reserve Capacity that includes a nomination to use the methodology described in clause 4.11.2(b) for a Facility that is yet to enter service (or re-enter service after significant maintenance or having been upgraded), or has not operated with the component configuration description outlined in clause 4.10.1(dA) for the full period of performance assessment identified in step 1(a) of Appendix 9 ~~under 4.11.2(b)~~, must include a report prepared by an expert accredited by

the IMO in accordance with clause 4.11.6. The IMO will use the report to assign Certified Reserve Capacity for the Facility and to determine the Required Level for that Facility. The report must include:

(a) ~~an estimate of what the expert considers the Certified Reserve Capacity of the Facility would have been for the purposes of clause 4.11.2(b) had the history of performance been available;~~ for each Trading Interval during the period identified in step 1(a) of Appendix 9, an estimate of the energy (in MWh) that would have been sent out by the Facility had it been in operation with the component configuration description provided under clause 4.10.1(dA) in the relevant application for certification of Reserve Capacity;

(b) a value, expressed in MW as a sent out value, which equals the 5 percent probability of exceedance of expected generation output for the Facility for all the Trading Intervals that occurred within the last three years up to, and including, the last Hot Season, where this value is to be used in the calculation of the Required Level in clause 4.11.3B;

(c) a proposed alternative value to that specified in clause 4.10.3(b), expressed in MW as a sent out value, to apply for the purposes of the Required Level, if in the opinion of the expert the value provided under clause 4.10.3(b) would not be a reasonable representation of the Facility's 5 percent probability of exceedance of expected generation output during its first year of operation; and

(d) the reasons for any proposed alternative value provided under clause 4.10.3(c)~~; and~~.

~~(e) an estimate of the expected electricity sent out by the Facility that would have been sent out for the full period of performance assessment under clause 4.11.2(b).~~

~~The applicant may provide the same report until the Facility has been in operation for the full period of performance assessment under clause 4.11.2(b).~~

7.13.1. System Management must provide the IMO with the following data for a Trading Day by noon on the first Business Day following the day on which the Trading Day ends:

…

(eB) the estimated decrease, in MWh, in the output of each Non-Scheduled Generator, by Trading Interval, as a result of System Management Dispatch Instructions, as determined in accordance with clause 7.7.5~~A~~B;

…

(g) details of the instructions provided to:

i. Demand Side Programmes that have Reserve Capacity Obligations; and

ii. providers of Supplementary Capacity;

on the Trading Day; and

(h) the identity of the Facilities that were subject to either a Commissioning Test or a test of Reserve Capacity for each Trading Interval of the Trading Day~~; and~~

(i) the estimated quantity of the energy not served (in MWh) due to involuntary Load curtailment for each Trading Interval of the Trading Day; and

(j) the total reduction in the energy consumption (in MWh) of any Interruptible Loads in accordance with the terms of an Ancillary Service Contract.

10.5.1. The IMO must set the class of confidentiality status for the following information under clause 10.2.1, as Public and the IMO must make each item of information available from the Market Web-Site after that item of information becomes available to the IMO:

(a) the following Market Rule and Market Procedure information and documents:

…

(f) the following Reserve Capacity information (if applicable):

i. Requests for Expressions of Interest described in clause 4.2.3 for the previous five Reserve Capacity Cycles;

…

ix. The following annually calculated and monthly adjusted ratios:

1. NTDL_Ratio as calculated in accordance with Appendix 5, STEP 8;

2. TDL_Ratio as calculated in accordance with Appendix 5, STEP 8; and

3. Total_Ratio as calculated in accordance with Appendix 5, STEP 10.; and

x. ~~Load for Scheduled Generation and the relevant Load for Scheduled Generation Trading Intervals as determined under Appendix 9.~~ The following information identified for a Reserve Capacity Cycle under Appendix 9:

1. the Existing Load for Scheduled Generation for each Trading Interval in the five year period determined under step 1(a); and

2. the 12 Trading Intervals occurring on separate Trading Days with the highest Existing Facility Load for Scheduled Generation for each year in the five year period.

Glossary

Existing Facility Load for Scheduled Generation: The MWh quantity equal to the sum (in MWh) of the total sent out ~~generation~~ energy generated by ~~of~~ all Facilities, Load reduction by Demand Side Programmes following a Dispatch Instruction, load reduction by Interruptible Loads in accordance with the terms of an Ancillary Service Contract and involuntary Load curtailment, minus the sent out energy generated ~~generation~~ (measured ~~or estimated~~) ~~of~~ by all Facilities (in MWh) that have applied to be assigned Certified Reserve Capacity under clause 4.11.2(b) adjusted for the impact of Consequential Outages on those Facilities, as determined in accordance with Appendix 9, step ~~6~~5.

New Facility Load for Scheduled Generation: The MWh quantity equal to the Existing Facility Load for Scheduled Generation minus the sent out energy generated (measured or estimated) by the new or upgraded Facility (in MWh) that applied to be assigned Certified Reserve Capacity under clause 4.11.2(b), as determined in accordance with Appendix 9, step 9.

Appendix 9: Relevant Level Determination

This Appendix presents the methodology for determining the Relevant Levels for Facilities that have applied for certification of Reserve Capacity under clause 4.11.2(b) for a given Reserve Capacity Cycle ("candidate Facilities").

For the purposes of the Relevant Level determination in Appendix 9:

- the full operation date of a candidate Facility for the Reserve Capacity Cycle is:
    - the date provided under clause 4.10.1(c)(iii)(7) or revised in accordance with clause 4.27.11A or clause 4.27.11B, where at the time the application for certification of Reserve Capacity is made the Facility, or part of the Facility (as applicable) is yet to enter service; or
    - the date provided under clause 4.10.1(k) in either the current or a previous Reserve Capacity Cycle, otherwise; and
- a candidate Facility will be considered to be:
    - a new candidate Facility, if the five year period identified in step 1(a) of this Appendix commenced before 8:00AM on the full operation date for the Facility; or
    - an existing candidate Facility, otherwise.

The IMO must perform the following steps to determine the Relevant Level for each candidate Facility:

Determining ~~the Facility Average Performance Level~~ Existing Facility Load for Scheduled Generation

Step 1: Identify:

(a) the five year period ending at 8:00 AM on 1 April of Year 1 of the relevant Reserve Capacity Cycle;

(b) the years occurring during the period identified in step 1(a), where the top 12 Existing Facility Load for Scheduled Generation Trading Intervals have not previously been determined; and

(c) the years occurring during the period identified in step 1(a), where the top 12 Existing Facility Load for Scheduled Generation Trading Intervals have been previously determined.

Step 2: Determine the quantity of ~~electricity~~ energy (in MWh) sent out by each candidate Facility using Meter Data Submissions for each of the Trading Intervals in the period identified in step 1(b).

Step 3: For each candidate Facility, identify any Trading Intervals in the period identified in step 1(b) where the Facility was affected by a Consequential Outage as notified to the IMO under clause 7.13.1A.

Step 4: For each candidate Facility and Trading Interval identified in step 3 use:

(a) the schedule of Consequential Outages provided by System Management under clause 7.13.1A;

(b) the quantity determined for the candidate Facility and Trading Interval~~s~~ identified in step 2; and

(c) the information provided by System Management under clause 7.13.1C

to estimate the quantity of ~~electricity~~ energy (in MWh) that would have been sent out by the Facility had it not experienced a Consequential Outage during the Trading Interval.

Step 5: ~~If a candidate Facility was not in service for one or more of the Trading Intervals in the period identified in step 1, then determine, for each Trading Interval in the period during which the Facility was not in service, an estimate of the quantity of electricity (in MWh) that would have been sent out by the Facility had it been in service. The estimates must reflect the estimates in the expert report provided for the Facility under clause 4.10.3, unless the IMO reasonably does not consider the expert report to be accurate.~~

Determine for each Trading Interval in the period identified in step 1(b) the Existing Facility Load for Scheduled Generation (in MWh) as:

(Total_Generation + DSP_Reduction + Interruptible_Reduction + Involuntary_Reduction) – CF_Generation

where

Total_Generation is the total sent out energy (in MWh) generated by all Facilities, as determined from Meter Data Submissions;

DSP_Reduction is the total quantity (in MWh) by which all Demand Side Programmes reduced their consumption in response to a Dispatch Instruction, as determined under clause 6.17.6(d)(i)(3);

Interruptible_Reduction is the total quantity (in MWh) by which all Interruptible Loads reduced their consumption in accordance with the terms of an Ancillary Service Contract, as provided under clause 7.13.1(j);

Involuntary_Reduction is the total quantity of energy (in MWh) not served due to involuntary Load shedding (manual and automatic), as provided under clause 7.13.1(i); and

CF_Generation is the total sent out energy (in MWh) generated by all candidate Facilities, as determined in step 2 or estimated in step 4 as applicable.

Step 6: ~~For each Trading Interval in the period identified in step 1determine Load for Scheduled Generation (in MWh) as:~~

~~(a) the total sent out generation of all Facilities, as determined from Meter Data Submissions; minus~~

~~(b) the total sent out generation of all the candidate Facilities, as determined in step 2 or as estimated under steps 4 or 5 as applicable.~~

Determine for each year in the period identified in step 1(b) the 12 Trading Intervals, occurring on separate Trading Days, with the highest Existing Facility Load for Scheduled Generation.

Step 7: Identify for each year during the period identified in step 1(c) ~~the 12 Trading Intervals occurring on separate Trading Days with the highest Load for Scheduled Generation as determined under step 6~~:

(a) the Existing Facility Load for Scheduled Generation previously determined for each Trading Interval in the year;

(b) the sent out energy generated (in MWh) by each candidate Facility for each Trading Interval in the year, that was used in the determination of the Existing Facility Load for Scheduled Generation for that Trading Interval; and

(c) the 12 Trading Intervals occurring on separate Trading Days that were previously determined to have the highest Existing Facility Load for Scheduled Generation in the year.

Determining New Facility Load for Scheduled Generation

Step 8: ~~For each candidate Facility and each of the 60 Trading Intervals identified in step 7, multiply the sent out generation (in MWh) of the Facility in the Trading Interval, as determined in step 2 or as estimated under steps 4 or 5 (as applicable) by 2 to convert to units of MW.~~ For each new candidate Facility and for each Trading Interval in the period identified in step 1(a) that falls before 8:00AM on the full operation date for the Facility, determine an estimate of the quantity of energy (in MWh) that would have been sent out by the Facility in the Trading Interval, if it had been in operation with the component configuration description provided under clause 4.10.1(dA) in the relevant application for certification of Reserve Capacity. The estimates must reflect the estimates in the expert report provided for the Facility under clause 4.10.3, unless the IMO reasonably does not consider the expert report to be accurate.

Step 9: ~~Determine the **Facility Average Performance Level** for each candidate Facility. The Facility Average Performance Level Facility f (in MW) is the mean of the MW quantities determined for the Facility in step 8 for the 60 Trading Intervals identified under step 7.~~

Determine for each new candidate Facility and for each Trading Interval in the period identified in step 1(a) the New Facility Load for Scheduled Generation (in MWh) as:

(a) if the Trading Interval falls before 8:00 AM on the full operation date for the Facility:

EFLSG + Actual_CF_Generation – Estimated_CF_Generation

where

EFLSG is the Existing Facility Load for Scheduled Generation for the Trading Interval, determined in step 5 or identified in step 7(a) as applicable;

Actual_CF_Generation is the sent out energy generated by the new candidate Facility for the Trading Interval, as identified in step 7(b), determined in step 2 or estimated in step 4 as applicable; and

Estimated_CF_Generation is the quantity determined for the new candidate Facility and the Trading Interval in step 8; or

(b) the Existing Facility Load for Scheduled Generation for the Trading Interval, otherwise.

~~***Determining the Facility Adjustment Factor***~~

Step 10: ~~Determine the **Facility Variance** for each candidate Facility. The Facility Variance for Facility f (in MW) is the variance of the MW quantities determined for the Facility in step 8 for the 60 Trading Intervals identified in step 7.~~ Determine for each new candidate Facility and for each year in the period identified in step 1(a) the 12 Trading Intervals, occurring on separate Trading Days, with the highest New Facility Load for Scheduled Generation.

Determining the Facility Average Performance Level

Step 11: For each existing candidate Facility, determine the 60 quantities comprising:

(a) the MWh quantities determined in step 2 or estimated in step 4 as applicable for each of the Trading Intervals determined in step 6, multiplied by 2 to convert to units of MW; and

(b) the MWh quantities determined in step 7(b) for each of the Trading Intervals identified in step 7(c), multiplied by 2 to convert to units of MW.

Step 12: For each new candidate Facility, determine the 60 quantities comprising:

(a) the MWh quantities identified in step 7(b), determined in step 2 or estimated in step 4 as applicable for each of the Trading Intervals identified in step 10 that fall after 8:00 AM on the full operation date for the Facility, multiplied by 2 to convert to units of MW; and

(b) the MWh quantities determined in step 8 for each of the Trading Intervals identified in step 10 that fall before 8:00 AM on the full operation date of the Facility, multiplied by 2 to convert to units of MW.

Step 13: Determine the **Facility Average Performance Level** for each candidate Facility. The Facility Average Performance Level for Facility f (in MW) is the mean of the 60 quantities determined for Facility f in step 11 or step 12 as applicable.

Determine the Facility Adjustment Factor

Step 14: Determine the **Facility Variance** (in MW) for each candidate Facility. The Facility Variance for Facility f (in MW) is the variance of the MW quantities determined for the Facility in step 11 or step 12 as applicable.

Step~~11~~15: Determine the **Facility Adjustment Factor** for each candidate Facility f (in MW) in accordance with the following formula:

~~Facility Adjustment Factor = G x Facility Variance (f)~~

Facility Adjustment Factor = min (G x Facility Variance (f), Facility Average Performance Level (f) /3 + K x Facility Variance (f))

Where

G = K + U/Facility Average Performance Level (f)

K is determined in accordance with the following table:

Reserve Capacity Cycle	Capacity Year	K value
2012	2014/15	0.001
2013	2015/16	0.002
2014	2016/17	0.003
2015 onwards	From 2017/18 onwards	To be determined by the IMO as part of the review required under clause 4.11.3B.

U is determined in accordance with the following table:

Reserve Capacity Cycle	Capacity Year	U
2012	2014/15	0.211
2013	2015/16	0.422
2014	2016/17	0.635
2015 onwards	From 2017/18 onwards	To be determined by the IMO as part of the review required under clause 4.11.3B.

Determining the Relevant Level for a Facility

Step ~~12~~16: Determine the Relevant Level for each candidate Facility f (in MW) in accordance with the following formula:

Relevant Level (f) = max(0, Facility Average Performance Level (f) - Facility Adjustment Factor (f))

Publication of information

Step ~~13~~17: Publish on the Market Web Site by 1 June of the relevant Reserve Capacity Cycle ~~the Trading Intervals identified in step 7 and~~:

(a) the Trading Intervals identified in step 6; and

(b) the Existing Facility Load for Scheduled Generation quantities calculated in step 5.

~~on the Market Web Site by 1 August of the relevant Reserve Capacity Cycle.~~