



28 July 2010
Ref: J1923

Ms Fiona Edmonds
Independent Market Operator
Level 3 Governor Stirling Tower,
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Perth WA 6000

Dear Fiona

Re: Required Level and the Reserve Capacity Mechanism

This document summarises my advice in relation to your proposal.

My understanding:

Based on my discussions with yourself and Ben Williams, it is now my understanding that the following describes how the IMO intends to use 'Required Level' in the Reserve Capacity Mechanism:

1. The term 'Required Level' will be applied to intermittent facilities that are entering service, and that have also been assigned Certified Reserve Capacity under 4.11.2(b) of the Market Rules.
2. The Required Level will be used as part of a process to determine that a facility is commissioned for the purpose of sections 4.26 (the Refund Table) and 4.13 (Reserve Capacity Security) of the Market Rules:
 - a. Once the facility enters service, its output will be monitored over a period that could extend up to the end of the first capacity year (let's call this the monitoring period);
 - b. There will be numerous review points during this monitoring period when the IMO will assess the output performance of the facility. The frequency of these review points may be monthly, or even interval by interval;

- c. During this monitoring period, if the facility demonstrates output over a defined number of trading intervals that is at least equal to 100% of its Required Level, then the IMO will consider the plant commissioned for the purpose of the Refund Table;
 - d. If the facility reaches 100% of its Required Level it can request the IMO to return its Reserve Capacity Security, and if it reaches 90% of its Required Level, the IMO will return this security at the end of the year;
 - e. Provided that the facility is determined by the IMO to be in commercial operation, if the facility can demonstrate some output, but this output is less than the Required Level, then it will be treated by the IMO as if it is partially commissioned as per the Refund Table. So, if the facility can demonstrate output at 50% of its Required Level for a sufficient number of trading intervals, then it will only be subject to 50% of the liabilities under the Refund Table. This varies from the current rules where if it is not 100% commissioned, it is liable for 100% of the refund liabilities under clause 4.26 of the Market Rules;
 - f. If the facility cannot demonstrate that it is in commercial operation, then it will not be considered commissioned per the Refund Table. It will therefore continue to be liable for penalties.
3. The Required Level will define a performance level for the facility. It will be specified as a level of output, expressed in MW for a given site, and set with reference to a maximum level of assumed output that is consistent with the assumptions that were used in the determination of its Certified Reserve Capacity.
 4. For most facilities, it is assumed the Required Level will be set equal to a given percentile of the 3-yr production output duration curve that was used by the IMO in setting the Certified Reserve Capacity of the facility.
 - a. If the setting of the amount of Certified Reserve Capacity was based on some other method or set of assumptions, then the setting of the Required Level for this facility would need to be consistent with this other method or set of assumptions.
 5. You are seeking advice on an appropriate setting for the Required Level of a facility, and also want advice on the number of trading intervals that should be used as part of this calculation.

My comments and advice:

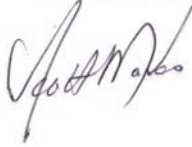
6. The concept of the Required Level, so far as you have described its intended application and use in the Market Rules, provides a practical approach to determine the extent that a facility is commissioned for the purpose of the Refund Table, and to determine the return of its Reserve Capacity Security.
7. The intended application and use of the concept of Required Level appears consistent with the achievement of the Market Objectives.

8. The Required Level should be set with reference to the same method and assumptions that were used in the determination of the facility's Certified Reserve Capacity.
 - a. If the amount of Certified Reserve Capacity that was set by the IMO for a facility did not rely on a 3-yr production output duration curve, as per the Market Rules, then the setting of the Required Level for this facility would need to be consistent with the other method and set of assumptions that were used to determine its amount of Certified Reserve Capacity.
9. In the case of a wind-based generator, the setting for Required Level could be quite high because power curves tend to flatten out for a relatively wide wind-speed range near the nameplate rating of a typical turbine. This is similarly the case for solar plants because generation tends to reach rated capacity in the peak of the day-time. A 3-year production output duration curve for these technologies would typically be quite flat over the range when generation is above zero.
10. I would suggest that a default setting for a facility's Required Level is the 95th percentile of the 3-year production output duration curve that was used in the determination of the facility's Certified Reserve Capacity. The IMO will need provisions in the Market Rules to vary from this default setting if there were atypical assumptions, or the use of alternative methods, that featured in its determination of Certified Reserve Capacity for the facility.
11. For the purpose of this advice I will refer to periodic evaluations of a facility's maximum generation output as assessments to determine its Demonstrated Maximum Generation (DMG or DMG evaluations). These are the evaluations that I am assuming the IMO will conduct at defined review points during the monitoring period for the purpose of assessing the facility's performance in respect of its Required Level.
12. DMG evaluations should be based on the maximum demonstrated output (MW) that is achieved over at least three trading intervals, that is, DMG should be set equal to the highest demonstrated output for the facility that is achieved or exceeded for at least three trading intervals. These need not be contiguous intervals.
 - a. This will provide some assurance that the facility can sustain and replicate the performance level.
 - b. The choice of three intervals is somewhat arbitrary, and should be subject to a future review.
13. The extent that a facility is determined to be partially commissioned can be based on the proportion [DMG/Required Level]. If the Required Level is set at the 95th percentile of the 3-year production output duration curve, this is a generous measure of partiality.
14. I would suggest running this approach past the settlements team to be sure that it is not too onerous for them, particularly to ensure that they can manage the frequency of these calculations, including possible recalculations during subsequent processes of data revision. Given that DMG may ratchet up in some circumstances (say as new turbines

enter service according to a sequenced process of installation and commissioning), changes to past measures of DMG due to meter data revisions may trigger new calculations for each subsequent interval. The consequences for settlements may be too time-consuming.

15. This entire approach is novel, and it may be used by intermittent resources other than wind. For this reason, I would recommend testing the concept with your working groups, and assume a need for a post implementation review at some point in the future –say after 12 months of operational experience.

Yours sincerely

A handwritten signature in black ink, appearing to read "Scott Maves". The signature is fluid and cursive, with a large initial "S" and "M".

Scott Maves