Addendum to Perth Energy's Submission to RC_2011_14

Received via email on 16 March 2012

Thank you for your email to follow up on Perth Energy's 6 March 2012 consultation response in relation to Rule Change RC 2011 14 "Calculation of Availability Class Quantity Correction".

In the email you queried Perth Energy's interpretation of clause 4.5.12 and in particular the interpretation of how to assign capacity to Availability Class 4. Please note that for simplicity we have chosen to completely disregard the effects of 4.5.12(b) in the examples we provide below. The reserve capacity target has therefore also been assumed to be identical to the forecast capacity requirement for the year.

As we stated in our consultation response we think that the natural starting point for interpreting clause 4.5.12 is 4.5.12(a), which states that an Availability Curve must contain "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".

There are 4 cut off points in the Availability Curve which fits nicely with the fact there are also four Availability Classes in the Market Rules. The way that Perth Energy interprets the requirement for an Availability Curve forecast as per 4.5.12(a) can be illustrated with the following figures:

Figure 1: 0 - 8760 hours capacity duration

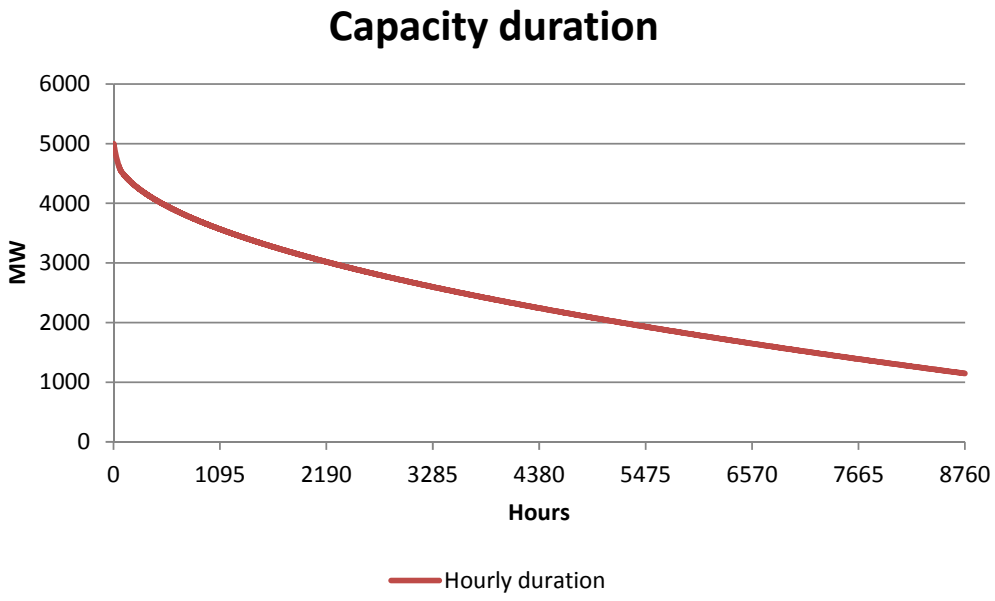
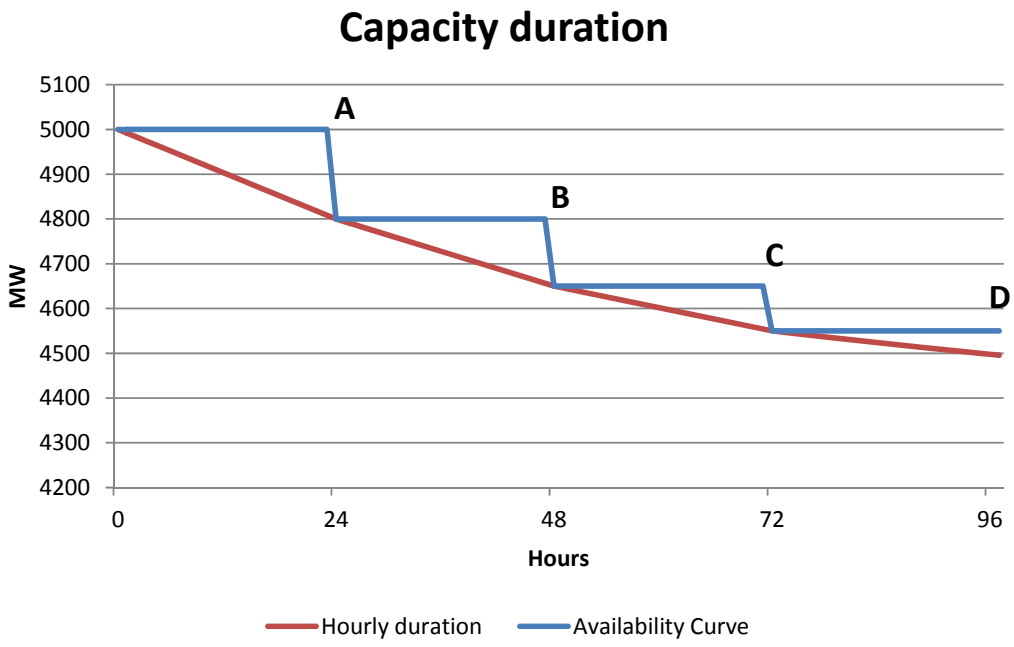


Figure 1 shows a hypothetical annual capacity duration curve corresponding to an annual maximum capacity requirement of 5,000MW and a minimum requirement of just over 1,000MW. If we turn our attention to the first 96 hours of that capacity duration curve we may get the following hypothetical figure:

Figure 2: 0 - 96 hours capacity duration curve



Overlayed on the hour by hour capacity duration curve we have attempted to illustrate what we believe a typical Availability Curve would look like.

Although the Market Rules are not explicit on this, Perth Energy has assumed that the IMO would take a conservative approach in setting the MW level of the Availability Curve corresponding to capacity required for more than 24 hours as being identical to the forecast peak requirement (ie the requirement that is only needed for 1 hour of the year). In the figure above that level is 5,000MW as illustrated at point A. In other words, the Market Rules have built in conservativism by requiring that the peak level of capacity forecast for the year (which will probably only be required for a single hour) is required to be available for not just one but more than 24 hours.

Clause 4.5.12(a) only talks about capacity being required for **more than** 24 hours, 48 hours 72 hours and 96 hours. This could be satisfied for example by the capacity being available for 24 hours and 1 second, 48 hours and 1 second and so on. Perth Energy considers 4.5.12(a) and Appendix 3 therefore intuitively align as Appendix 3 for example defines Availability class 4 as being available between 24 and 48 hours (i.e. more than 24 hours, but at the same time not overlapping with capacity that is required for **more than** 48 hours).

Point B in Figure 2 above illustrates the level of capacity that is required for more than 48 hours. In the figure this level is 4,800MW. Again, assuming the IMO would be using the conservative rationale described above it would set the level of capacity required for more than 48 hours as equal to the capacity corresponding to the 24th hour on the capacity duration curve. That would result in the market being able to cover the forecast capacity requirement corresponding to the forecast 24th highest interval for more than 48 hours (at least an additional 24 hours above expectations).

Points C and D correspond to the level of capacity that is required for more than 72 hours and 96 hours respectively and are in this example 4,650MW and 4,550MW.

Using the example figures above and applying the calculation methodology in clause 4.5.12(c) to assign capacity to the different Availability Classes we get the following results with the current and proposed wording of the market rules:

	Current methodology	Proposed methodology
Capacity Target	5,000	5,000
Availability Class 4	200	0
Availability Class 3	150	200
Availability Class 2	100	150
Availability Class 1	4,550	4,650

With the proposed changes Availability Class 4 would become redundant (this is likely to change once clause 4.5.12(b) comes into play) due to the added conservativism of subtracting the level corresponding to capacity required for more than 24 hours rather than for more than 48 hours from the capacity target when calculating the capacity in Availability Class 4.

Perth Energy's interpretation of clause 4.5.12 and Appendix 3 of the Market Rules is obviously linked to its interpretation of how the Availability Curve should be constructed. Perth Energy would welcome feedback from the IMO as to how the IMO actually constructs the Availability Curve.