Taralga Wind Farm

cwp Renewables

26 May 2016

Attn. Clare Greenwood, Forecasting, AEMO

GPO Box 2008

Melbourne, VIC 3001

Dear Ms Greenwood,

Energy Conversion Model Consultation May 2016

As the operational controller of Taralga Wind Farm (TWF), CWP Renewables (CWPR) appreciates the opportunity to provide input into the consultation on the Energy Conversion Model (ECM) guidelines for solar and wind farms.

As a participant in the NEM, CWPR believes that improvements to the ECM guidelines allows for both an improved dispatch for semi-scheduled generators, and positive outcomes for the NEM.

CWPR/TWFs replies to the questions raised in the ECM Guidelines consultation issues paper are provided below.

3.1.7 - SCADA Local Limit

1. Do you agree that the requirement for a SCADA Local Limit will improve your dispatch outcomes?

With only a single 132/33kV transformer and dedicated Essential Energy 132kV transmission line connection to TransGrid at Marulan substation, TWF is unlikely to be in a position that it is constrained by 'Local Limits' which are not reflected by the 'No. Turbines Available', 'No. Turbines In Operation', and 'Possible Active Power' data points TWF currently sends to AEMO over SCADA.

TWF has however, on multiple occasions, been constrained by TransGrid while they perform works at the Marulan substation and request a zero set point at TWF. This period of zero production is manually entered into the EMMS Intermittent Generation Portal as all units unavailable, but this is far from ideal and would be much better represented by a distribution constraint in the ECM.

2. Do you agree with the proposed validation of the SCADA Local Limit, and the proposed validation range (see Section 3.1.6)? If not, how should quality be handled?

Based on the information available, it is CWPR's belief that the 'Local Limit' should be applied if it is less than the Dispatch UIGF as opposed to the nameplate rating of the wind farm.

3. What types of limits affect your semi-scheduled generating unit? Who is responsible for determining those limits, how dynamic are they, how often do they occur, and how they are applied?

TWF uses the HardSoftware Infolite dispatch system, interfacing with the wind farm SCADA, to automatically match wind farm production to dynamic dispatch limits set by AEMO. TWF very rarely has active power production limits imposed by AEMO.

The more frequent limits that affect TWF have been network constraints from Essential Energy and TransGrid relating to scheduled maintenance on the transmission line and TransGrid substation. These would still not be reflected by the 'Local Limits' proposal, but need be accounted for by AEMO in any updates to the ECM.

4. Please quantify for your wind/solar farm(s) the likely impact of the exclusion of distribution network constraints not managed by AEMO from the SCADA 'Local Limit' definition (see Section 3.1.1).

The exclusion of DNSP/TNSP constraints from the ECM (be it included in the 'Local Limits', or as a separate parameter) in the ECM will vastly reduce the benefit of updating the model. TWF currently have to use the EMMS Intermittent Generation Portal to show the effects of these constraints, which is not a true reflection of the issue, and not how the system was intended to be used. This would ideally be entered in an automated (SCADA?) system by the DNSP/TNSP requesting the constraint, updating the ECM automatically.

5. What do you estimate are your upfront and ongoing costs in providing and maintaining a SCADA 'Local Limit'?

Retrofitting the existing wind farm SCADA system would incur implementation costs for TWF, and likely the DNSP/TNSP, to add the SCADA points required. Despite this, TWF believes that the provision of a 'Local Limit' signal as a whole is beneficial to market dispatch outcomes.

6. Are there any other related matters you wish to raise?

Distribution limits should be included as an additional signal to AEMO. Implementation in this manner allows AEMO to see transmission, distribution and connection asset constraints. Whilst updates to the ECM are being conducted, it is sensible to add the impact of distribution constraints which are not currently taken into account by AEMO for dispatch.

Although a rule amendment is required to incorporate distribution limits (Section 3.1.3), acquiring the signal now is sensible in terms of future outcomes.

As such, the term "Local Limit" would prove to be ambiguous as from its name it is not clear whether it takes into account distribution level constraints.

3.2.3 - Changes to SCADA Wind Speed

1. Do you agree that the proposed changes will improve your dispatch outcomes?

The TWF SCADA system currently submits Wind Speed measurements from both Met Masts and from three clusters of Wind Turbines (with each cluster comprised of a different model of turbine) at two second sample rates so this is likely to have little impact on our dispatch outcomes.

2. What do you estimate are your upfront and ongoing costs in applying this proposed definition?

There are not likely to be any changes needed at TWF.

3. The vendor of AWEFS prefers wind speed measurements from turbine nacelle anemometers over meteorological mast measurements. Do you agree, and what information can you give about the suitability and relative accuracy of the two measurement types for your wind farm(s)?

Experience shows that a class 1 anemometer mounted on a mast is able to determine the wind speed to a higher level of accuracy than the ultrasonic wind sensors on a turbine nacelle. However, generally data coverage and reliability is higher in a nacelle based system than in a met mast, and is guaranteed.

It may be beneficial to use a combination of wind speed and direction to calculate possible power (if not supplied directly from wind farm SCADA) as the topography and turbine layout may result in different levels of generation at the same wind speed, based on incident wind direction. There should also be standards surrounding the sampling rate, time averaging and multi-location averaging used.

3.3.4 - SCADA Possible Power

1. Do you agree with the definition of SCADA Possible Power?

TWF agrees with the current definition of SCADA Possible power.

2. Does your wind farm control system currently produce an estimate of Possible Power, or an equivalent? If not equivalent, what can it produce?

Yes, the TWF SCADA system currently submits 'Possible Active Power' via TransGrid.

3. How is this estimate calculated?

The estimate is calculated from the nacelle anemometer wind speed and the power curve of the turbine. Turbines that do not have the ability to generate are not included. Turbines that are not communicating with the main park controller are also not included in the calculation.

4. If the control system does not currently produce a suitable Possible Power estimate, what would be the implementation costs of doing so?

Not applicable to TWF.

5. How should data quality, validation and update frequency issues be handled for Possible Power?

The wind turbine/SCADA suppliers seem to have good models for estimating 'Possible Power' in their latest developments, but it is likely to be difficult to implement on older wind farms.

Items to bear in mind include:

- The update frequency of this tag should ideally be instantaneous to reflect the availability of generators at any particular point in time.
- The calculations should account for any 'wind sector management' applied to individual turbines.
- The 'Possible Power' estimates are likely to be calculated at an individual turbine level, so won't account for any losses in the wind farm reticulation system.
- Whilst a 'Possible Power' can give an estimate of wind farm curtailment, it cannot provide an accurate measure of what the wind farm is capable of producing in the next dispatch interval.

It is also worth noting that with the correct turbine/inverter/storage technologies, operating strategies and control systems, including those proposed here, it may be possible in the near future for intermittent generators to be used for Frequency Control and Ancillary Services. This may enable more renewables to be integrated into the NEM as coal fired power stations are retired.

Thank you for the opportunity to comment on the proposed changes to the ECM. We look forward to these changes resulting in a better functioning system.

Best regards,

Derek Dymond

Asset Manager

CWP Renewables Pty Ltd