GUIDANCE ON AEMO AGREEMENT ON ECM GUIDELINES REQUIREMENTS

PREPARED BY: Forecasting

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FINAL

1 Purpose

The Energy Conversion Model Guidelines (ECM Guidelines) for Wind and Solar Farms, as amended in the Consultation process run by AEMO commencing 18 March 2016, include specification of SCADA signals that Semi-Scheduled wind and solar farms are required to provide to AEMO for forecasting purposes.

Documents from the Consultation, which discuss each of the amendments in detail, are available at:

http://aemo.com.au/Stakeholder-Consultation/Consultations/Energy-Conversion-Model-Guidelines-Consultation---Wind-and-Solar-Farms

A number of signal definitions in the amended ECM Guidelines include the phrase “by agreement with AEMO” or similar.

The reasoning behind this qualification is to recognise that work on AWEFS and ASEFS is ongoing and that implementation of these changes may for many farms impose costs in the immediate term which are not commensurate with the benefits to the market to be obtained.

This document outlines the factors AEMO will consider in giving agreement to exempt a particular farm from a requirement while the work on AWEFS and ASEFS is under development.

AEMO will assess each request for exemption from any requirement in the ECM Guidelines on a case-by-case basis.

For the purposes of that assessment an existing farm is defined here as a wind or solar farm that was operating in the National Electricity Market prior to the determination of the Amendments to the ECM Guidelines on 9 December 2016.

Any party affected by the changes should contact op.forecasting@aemo.com.au in the first instance and outline the basis of any claimed need for exemption. For applicants new to the National Electricity Market, AEMO will discuss such exemptions during the registration process.

2 SCADA Signals

The definition for each signal from the ECM Guidelines spreadsheet is shown in italics in the following sections.

2.1 Wind Farm SCADA to AEMO (Wind only) / Solar Farm SCADA to AEMO (Solar only)

Instantaneous measurements are required, unless otherwise agreed by AEMO. Instantaneous means values updated at least every 4-10 seconds, with 4 seconds or faster preferred. If only averages are available, a maximum 15-second average update is required.

AEMO requires all new wind and solar farms to provide instantaneous measurements.

Some existing wind farms provide some signals such as ambient temperature and wind speed as a 10-minute average. As discussed in the “Wind Speed SCADA” section of the Consultation papers, AEMO will assess the correlation between wind speed and generation as required for AEMO’s forecasting purposes, and will work with the relevant participant to find the best means to improve the correlation if necessary, which may include requiring a faster wind speed measurement.

2.2 Number of wind turbines available for generation data (Wind only)

Number of turbines available for generation. This definition is the summation of:

- *Turbines operating.*
- *Turbines available to operate, but not operating due to ambient wind conditions (very low / high wind speeds, extreme direction change).*
- *Turbines available to operate, but paused due to down regulation.*

This definition excludes all the following cases:

- *Turbines under maintenance or repair.*
- *Turbines with a fault or damage.*
- *Turbines not yet built.*
- *Transmission/distribution network not available.*

If agreed with AEMO, turbines paused due to ambient temperature may be counted as available in this signal.

AEMO expects all new wind farms to comply with the definition, but will consider the variation to include turbines paused due to ambient temperature as available, if the participant demonstrates to AEMO's satisfaction that it was technically difficult for their turbine type to provide the value as defined.

AEMO does not expect existing wind farms to reconfigure their Turbines Available SCADA signal to meet the new definition, and as such exempts existing farms from the requirement to implement this change. AEMO understands some participants may choose to reconfigure this signal for the improvement to dispatch forecast accuracy it may give in the situation of extreme temperature cut-out.

2.3 Turbines Extreme Wind Cut-out (Wind only)

This is the number of turbines counted in the Turbines Available signal that are currently in cut-out mode due to extreme high wind speed or extreme wind direction change.

If agreed with AEMO, this signal may be provided at a farm level. If agreed with AEMO, extreme wind direction change may be excluded.

This SCADA item is defined as "Optional".

In deciding if the signal should be provided at a farm level, AEMO would primarily consider if the turbines are the same size across clusters.

In deciding if extreme wind direction change may be excluded, AEMO will consider this if the participant demonstrates to AEMO's satisfaction that it was technically difficult to do for their turbine type.

2.4 Local Limit (Wind and Solar)

This SCADA item is defined as "Mandatory, unless otherwise agreed by AEMO".

In MW, the SCADA Local Limit for a wind farm is the lower of its plant availability and all technical limits on the capacity of its connection assets to export energy.

When implemented in AWEFS, the SCADA Local Limit is used to cap the UIGF for the wind farm in the dispatch timeframe.

The SCADA Local Limit excludes limits on a transmission network and distribution network (to ensure AEMO's compliance with clause 3.7B(c)(6) of the Rules), and may exclude other limits managed by AEMO through the central dispatch process.

Limits already communicated in the SCADA Turbines Available signal may be excluded from the SCADA Local Limit.

Manually-applied transient limits not intended to apply at the end of the next dispatch interval may be excluded from the SCADA Local Limit.

The SCADA Local Limit should not exceed the higher of the nameplate rating and the Maximum Capacity of the wind farm.

AEMO requires all new wind and solar farms to provide this signal and recommends, in order to improve dispatch forecast accuracy, that all existing wind and solar farms provide this signal.

For existing farms when assessing any request for exemption from this requirement AEMO would consider the likelihood of limitations on the connection assets affecting the farm that are not already able to be communicated via the Turbines Available SCADA. Such limitations may include:

- Multiple transformers that may independently have outages.

- Reactive plant that may limit the generator's output in the case of outage.
- Cable-related limitations that would limit the total export of the plant but not the operation of specific turbine strings.