DRAFT NOTES OF MEETING – AWEFS/ASEFS Workshop

MEETING: # 1

DATE: Tuesday 21 Feburary 2017

TIME: 9:30am – 12.30pm AEST

CONTACT: Op.Forecasting@aemo.com.au

ATTENDEES:

NAME	ORGANISATION	LOCATION
Marcelle Gannon (chair)	AEMO	Melbourne
Mark Stedwell	AEMO	Melbourne
Mike Davidson	AEMO	Melbourne
Leanna Tedesco	AEMO	Melbourne
Jack Fox	AEMO	Melbourne
Ross Gillett	AEMO	Melbourne
Petar Pantic	AEMO	Melbourne
Steven Disano	AEMO	Melbourne
Stuart Grierson	AEMO	Melbourne
Gary Eisner	AEMO	Melbourne
Hans-Peter (Igor) Waldl	Overspeed	Melbourne
Felix Dierich	Overspeed	Melbourne
Peter Duddy	Acciona	Melbourne
Peter Veljkovic	Acciona	Melbourne
Ruchira Wellmillage	Acciona	Melbourne
Rajesh Arora	AECOM	Melbourne
Naomi Stringer	AECOM	Teleconference
Carl Christiansen	AEMO	Teleconference
Kate Stoeckel	AGL	Teleconference
Liz Gharghori	AGL	Melbourne
Derek Dymond	CWP Renewables	Teleconference
Matthew Caines	EDL	Teleconference
Colin Bonner	Fulcrum 3D	Melbourne
Krish Karimbil	Goldwind	Teleconference
Jonathan Dyson	Greenview Strategic Consulting	Melbourne
Simon Vanderzalm	Greenview Strategic Consulting	Melbourne
Harley Mackenzie	Hard Software	Melbourne
Niva Lima	Infigen Energy	Teleconference
Angus Holcombe	Meridian Energy	Melbourne
Daniel Hillier	Meridian Energy	Melbourne
James Waldren	Meridian Energy	Melbourne
Jose Fortes	Neoen	Teleconference
Kate Summers	Pacific Hydro	Melbourne
Ryan Jennings	Pacific Hydro	Melbourne
Steve Brown	Pallisade Asset Management	Melbourne
Gyorgyi Danka	Pallisade Asset Management	Melbourne
Prabath Atapattu	Senvion	Melbourne
Katrina Swalwell	Senvion	Melbourne
Nicholas Vavladellis	Siemens	Teleconference
Rick Zhang	Siemens	Teleconference

Allen James	Siemens	Teleconference
Nick Engerer	Solcast	Melbourne
Steen Nielsen	Suzlon	Teleconference
Perrin Samuel	Tilt Renewables	Melbourne
Sam Fyfield	Tilt Renewables	Melbourne
Evan Boyt	Trustpower	Teleconference
Philip Vegh	Vestas	Melbourne
David Osmond	Windlab	Teleconference
Keith Ayotte	Windlab	Teleconference
Rick Haines	Woolnorth Wind	Melbourne

References to slides are from "AWEFS ASEFS Vendor Workshop Presented.pptx", attached to these notes.

NOTES OF DISCUSSION AT THE MEETING

The aims of this meeting were to:

- Introduce Overspeed, the vendors of AWEFS and ASEFS
- Educate attendees about the AWEFS and ASEFS dispatch forecasting process, as presented by Overspeed, and allow discussion with Overspeed.
- Seek feedback on a potential changed or additional "Turbines Available" signal for use in dispatch forecasting, to address high-speed wind cut-out and related issues.
- Seek feedback on a possible approach to implementation of Estimated Power, and discuss the next steps.
- Educate on the value of an improved wind speed SCADA signal.
- Seek feedback and stimulate discussion on emerging forecasting technologies.

Updates:

Updates were provided on:

- Local Limit software update: anticipated to be implemented in AWEFS and ASEFS by early April 2017.
- Power curve software update: anticipated to be implemented in AWEFS and ASEFS by early April 2017.

Overspeed introduction

Igor Waldl presented slides 5-11 to introduce Overspeed and the ANEMOS forecasting systems in Australia.

Overspeed presentation on AWEFS/ASEFS dispatch forecasting

Felix Dierich presented slides 12-34. These covered:

- Overview of calculation of AWEFS 5-minute forecasts, including the PD forecast blending step.
- Illustration of use of "Potential Power" in AWEFS/ASEFS for unconstrained dispatch forecast.
- Explanation of use of each SCADA channel.
- Outline of Power Estimate Tuning process.

- Illustration of the need for a good correlation between measured wind speed and output, with an average of wind speed across all nacelles recommended.
- Explanation of the improvements in the upcoming power-estimate tuning software update.

Question: Why isn't wind direction used in dispatch forecast? It would help in the mid-range. *Answer from Overspeed:* There is not enough data for each direction to make a robust dispatch forecast, particularly at high wind speeds. Wind direction from the weather forecast is used in the PD/STPASA forecasting.

Question: Why is a farm-level wind speed used for the dispatch forecast – why not a per-cluster? What about mixed-MW farms? *Answer from Overspeed:* An average power curve is used for mixed-MW farms. It's not currently in the AWEFS design to do a power curve per cluster, but we will look into the value it would deliver. *(Action taken on AEMO).*

High-speed cut-out / Turbines Available

Marcelle Gannon presented slides 35-39. These covered:

- Current status, meaning and use of "Turbines Available" SCADA signal.
- Need for better information for AWEFS in dispatch when there is high-speed cut-out.
- Solution ideas.
- Discussion on "Turbines-Ready-To-Run" idea.

Wind turbine vendors said they would need to think about the "Ready-to-Run" idea.

Wind farm operators noted that Estimated Power would give more information, particularly when there was turbine de-rating and wind sector management. A concept of "Pending Run" was suggested for turbines that are coming online after extreme wind cut-out.

Action taken on AEMO – to follow up with wind turbine vendors whether this concept of turbines ready to dispatch is meaningful, and to further assess what value it could deliver if added to the ECM Guidelines through consultation.

"Estimated Power" discussion

Marcelle Gannon presented slides 40-46. These covered:

- High-level definition of Estimated Power SCADA signal.
- A possible approach for implementation in AEMO's systems.
- Features required in the SCADA signal.
- Feedback sought on possible implementation approach.
- Next steps.

Operators emphasised that they would only want their Estimated Power data overridden by an internal AWEFS forecast for material system security issues, and that they would want to know when this had happened. AEMO agreed that it is its intention to provide reports or data on the operation of the validation.

Operators advised that some could provide a useful signal now.

Discussion on technically how to get the data into dispatch – via AWEFS, or a shorter route? Operators expressed that there would be value in for example sampling at 30 seconds before the start of the dispatch interval instead of 2 minutes. One suggestion was for AWEFS to validate the Estimated Power SCADA signal and identify periods when it should be rejected, but for the actual sampling to take place just before dispatch.

Question: How does "Estimated Power" relate to 5-minute pre-dispatch? Answer: AEMO to take on notice (Action on AEMO).

On the question in the slides of how much precision this SCADA signal would likely have, 0.1 MW was suggested by the room.

AEMO asked for wind and solar generators to provide by spreadsheet or SCADA any historical data they have for an Estimated Power or a signal that approximates this, for AEMO to analyse. *Action on AEMO: to send an email with details of what's needed (sent 28/2/17), Action on Wind/Solar Generators: to send this data to AEMO. Action on AEMO to analyse this data and report back.*

Discussion of what's happening elsewhere:

- Generators in WA provide wind generation forecasts.
- In Europe the Possible Power (current time value) is used for compensation for curtailment.

It was agreed that development should be a collective effort where possible, and that a 5-minute ahead value wasn't generally available at the moment.

Question: Could a third party provider give a forecast for dispatch? Answer from AEMO: A participant is welcome to determine their Estimated Power signal to AEMO however they can, which could include using the services of a third-party provider.

Question: How to improve the short term forecasting other than Estimated Power? Answer from AEMO: Improving the wind speed signal would benefit many wind farms. Otherwise, accelerate the Estimated Power development process.

Emerging Forecasting Technologies

Marcelle Gannon presented slide 48, inviting comment on new technologies for forward forecasting of wind and solar farm output.

Colin Bonner of Fulcrum 3D and Nick Engerer of Solcast spoke briefly about their capabilities in solar forecasting. For Fulcrum 3D this is in the 10-15 minute ahead range using cloud cams.

Actions arising

- **AEMO** to follow up idea of calculating dispatch forecast by cluster instead of on a whole-wind-farm basis.
- **AEMO** to arrange a meeting with wind and solar farm vendors to discuss technical details of "Estimated Power" and turbine availability.
- **AEMO** to further assess the value a different turbine available signal would deliver.
- **AEMO** to further investigate the question of how Estimated Power relates to 5-minute pre-dispatch.
- **Wind/Solar Generators** to provide by spreadsheet or SCADA any historical data for an Estimated Power or approximate signal. **AEMO** to send email with details of this request (sent 28/2/17).
- **AEMO** to analyse Estimated Power data sent by generators and report back.