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Sydney

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Dr John Tamblyn
Chairman
Australian Energy Market Commission
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By email: submissions@aemc.gov.au

Dear John

Supplementary Submission on "Central Dispatch and Integration of Wind and Other Intermittent Generation" (Semi-Dispatch) Rule Change

As the proponent of this Rule change NEMMCO has reviewed the first round submissions from other parties and is pleased to note that they are broadly supportive of the concept of improving control over significant intermittent generation to manage power system security.

However, NEMMCO notes that a number of submissions have raised concerns over the cost implications of NEMMCO's proposal, particularly for smaller intermittent generation projects, and those submissions have put forward alternative proposals that, if implemented, could diminish NEMMCO's ongoing ability to meet its power system security obligations within the framework of, and consistent with, a competitive National Electricity Market (NEM).

This supplementary submission seeks to respond to some of those concerns, as well as clarifying our proposal where there appears to be some points of confusion.

1. Exclusion of Distribution-Connected Generation from Semi-Dispatch

The Auswind, Pacific Hydro and Roaring40's submissions each suggest that wind farms connected to the distribution network do not pose a sufficiently material threat to power system security that would warrant the degree of centralised semi-dispatch control that NEMMCO has proposed.

These submissions alternatively proposed that only intermittent generators of combined nameplate rating ≥30 MW and connected at greater than 100kV should be classified as semi-scheduled generating units, with all others automatically exempted subject to NEMMCO's right to impose certain semi-scheduled requirements under our proposed Clause 2.2.3(c).

The Pacific Hydro submission added that the potential impact of distribution-connected wind farms on power system security could be satisfactorily managed in other ways, such as via the local DNSP.

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The Roaring40's submission commented that the 100kV threshold could possibly be relaxed "in the not too distant future" as remote control technology became more cost-effective.

NEMMCO Response

NEMMCO notes that at present 21% of the total installed significant wind farm capacity in the NEM (163 MW out of 770 MW) is distribution-connected - these are Canunda (46 MW), Challicum Hills (52 MW), Starfish Hill (34 MW) and Yambuk (30 MW). Of these, both the Canunda and Challicum Hills wind farms are implicated in transmission network constraints managed by NEMMCO (as explained further below).

NEMMCO's Rule Change proposal to integrate significant intermittent generation into the central dispatch process is designed to achieve two complementary aims:

- to operate the power system so as to minimise the risk of violating its technical envelope, and;
- to do so in an efficient manner that improves the management of network congestion, in keeping with the market design principles outlined in Clause 3.1.4 of the National Electricity Rules.

While it is generally true that NEMMCO does not have direct oversight over the distribution network (and delegates this function to the NSP) NEMMCO still has an overarching responsibility under the National Electricity Law and Chapter 4 of the National Electricity Rules to maintain and improve power system security, which includes the operation of both the transmission and distribution networks of the national electricity system within their technical envelope, as well as managing the dispatch of all scheduled plant connected to those networks.

In the absence of direct control over the affected distribution elements NEMMCO develops and applies constraint equations to control transmission network flows to mitigate the risks of either:

1. Thermal overloads on the distribution network arising from post-contingent operation of parallel transmission network elements; or
2. Power system instability arising from operation of distribution-connected generation.

A current example of a first type is the system normal " V>SML_NIL_7" constraint equation that controls the Victoria to SA flow over Murraylink in order to avoid overloading the Ballarat North-Buangor 66kV distribution line upon loss of the parallel Ballarat to Horsham 220kV transmission line. In this case the Challicum Hills wind farm is connected to Powercor's 66kV distribution network. However as NEMMCO has no control over the wind farm output then post-contingent distribution network loadings must be indirectly controlled by reducing the pre-contingent flow over the parallel transmission network to the detriment of the efficient operation of the NEM.

A current example of the second type is the system normal "'V::S-NIL" constraint equation that jointly controls the Victoria to SA flow over the Heywood interconnector and local scheduled generation in order to prevent post-contingent instability. In this case the Canunda wind farm is connected to the ETSA Utilities 33kV distribution network and specifically appears as a constraint equation RHS term (along with Lake Bonney 1 wind farm). This constraint equation, and its materiality to transmission network congestion, was discussed in Appendix B of NEMMCO's Rule proposal. Note that the scheduled Lake Bonney 2 wind farm was recently added as a LHS term of this constraint equation (that is, as a controllable variable).

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Other Alternatives Proposed

Auswind's submission acknowledges that the aforementioned power system security issues involving distribution-connected wind farms can occur, and have alternatively suggested that NEMMCO and the relevant NSP should identify those exceptional cases at the time that the connection to the distribution network is being negotiated, and then place specific obligations within the connection agreement for that wind farm to subsequently register with NEMMCO as semi-scheduled.

However NEMMCO believes this arrangement would be problematic, as neither NEMMCO nor the NSP can predict with any certainty whether a future wind farm would ever materially impact on transmission or distribution network security over the life of the project, particularly if other generators subsequently connect into that part of the network and cause congestion.

If this alternative arrangement was adopted, and an exempted wind farm subsequently became involved in a network congestion issue, then NEMMCO would need to deal with the increased risk of violating network security over the ensuing period until the affected part of the network were relieved through augmentation (if indeed that occurs at all). In this case NEMMCO would be likely to mitigate that increased risk through either increasing the relevant network operating margins and/or directing affected scheduled generation, to the detriment of efficient operation of the NEM.

NEMMCO also believes that while the local DNSP could manage thermal overload issues on the distribution network through direct control over affected distribution-connected wind farms, for the reasons outlined in NEMMCO's Rule proposal this is not considered to be a long-term solution as such local control is inherently coarse and only undertaken once network security is violated – hence this alternative does not address the underlying market issue of inequitable dispatch that favours non-scheduled over scheduled generation at times of network congestion. In addition the local DNSP would not be able to resort to simple direct wind farm control measures to address the more complex issues of power system stability that typically extend into the wider transmission network and hence fall outside of their control.

2. Use of Unconstrained Intermittent Generation Forecasts

The Auswind submission argued that the application of *unconstrained intermittent generation forecasts* as specific constraints on the central dispatch algorithm (proposed Clause 3.8.1(b)(12)) was inconsistent with the intent of the Rule Request.

Auswind also disagreed with the next-day publication of individual *dispatched generation* and *unconstrained intermittent generation forecast* data for all intervals of the previous trading day (proposed Clause 3.13.4(q)), contending that the former (representing *dispatch caps*) should only be reported for semi-dispatch intervals and the latter only reported in non-semi-dispatch intervals.

NEMMCO Response

In response to Auswind's first issue NEMMCO wishes to clarify that the *unconstrained intermittent generation forecast* for each semi-scheduled generating unit would be a required standard input to the central dispatch algorithm, representing the expected generation from that unit assuming no binding network constraints on that unit's output.

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The *unconstrained intermittent generation forecast* applies as only one of the upper limits (or constraints) on the value of the dispatch cap calculated by central dispatch – a network constraint involving that unit, or the economics of the dispatch offer itself would effectively represent other upper constraints. If either of these reduce the calculated dispatch cap to below the *unconstrained intermittent generation forecast* then this would result in the interval being identified as a semi-dispatch interval as part of the dispatch instruction and require the Generator to comply with the associated dispatch cap.

In this sense, the *unconstrained intermittent generation forecast* is a fundamental component of the Semi-Dispatch proposal, as it aims to improve the accuracy of the central dispatch calculation at all times, not only during semi-dispatch intervals.

In response to Auswind's second issue NEMMCO's believes that all of the above data should be published for all intervals as proposed by NEMMCO, for reasons of simplicity, market transparency and consistency with the current next-day reporting of scheduled unit data.

NEMMCO agrees with Auswind that *dispatched generation* (aka *dispatch cap*) only applies during semi-dispatch intervals, and so NEMMCO would support an extension to the proposed Clause 3.13.4(q) to include the additional reporting of whether a particular interval is either a semi-dispatch interval or a non-semi-dispatch interval.

3. Costs of Semi-Dispatch Implementation

The Auswind submission noted that NEMMCO had not commented on the cost of personnel and associated skill sets, or on the preparation required to incorporate the systems inferred in the NEMMCO Semi-Dispatch proposal, and suggested that NEMMCO should be required to do so.

However, NEMMCO is not in a position to make an informed comment on the implementation costs faced by Generators required to participate in Semi-Dispatch.

4. Interpretative Issues

NEMMCO is concerned that some of the submissions appear to have misinterpreted both NEMMCO's proposal and the current Rule requirements in a number of areas, including:

- PASA requirements under Clauses 3.7.1 and 3.7.2;
- Compliance with dispatch instructions under Clauses 4.9.2;
- Form of dispatch instructions under Clauses 4.9.5; and
- Active Power Control System requirement under S5.2.5.14

If you require any further clarification on any of the matters covered in this submission please contact Ross Gillett on (02) 9239 9114.

Yours sincerely

Brian Spalding

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