07 November 2017

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Lodged online www.aemc.gov.au.

Reference: ERC0222

RE: AEMC, Generator Technical Performance Standards, Consultation Paper, 19 September 2017, Sydney.

Vestas welcomes the opportunity to make a submission to the Australian Energy Market Commission (AEMC)'s consultation into the Generator Technical Performance Standards rule change.

Vestas is the world's leading supplier of wind power solutions, having installed close to 82 GW of wind turbines in 76 countries across the globe. Vestas is also a member of the Clean Energy Council (CEC).

Vestas is pleased to submit the following comments:

S5.2.5.1 and S5.2.5.13

The recommended amendment to the automatic access standard to require a generating system to have facility to regulate voltage to within 0.5% of the setpoint within the range of 95% to 105% will need to consider the site specific condition of the grid connection. In areas where the grid is strong, the effect of reactive power on the grid voltage is small. Hence it may take excessively large amount of additional reactive power in order to reach the setpoint.

Similarly, for the minimum access standard, while the requirement for accuracy is less onerous at 2% and the operating range is reduced, 98% to 102%, the same condition applies where the ability to regulate the voltage for a given reactive power depends on the grid strength. Thus the proposed requirement will place excessive burden on generators connecting to strong grid.

In addition, where the grid is strong, the generating system may not operate on voltage control and therefore it is not an appropriate reference for determining reactive power requirement.

The requirement for reactive power rise time for a 5% step change in the voltage setpoint of less than 5 seconds will be fine for normal system cases. But in weak grid connection, it may be required to ramp up the post disturbance reactive power at a slower rate to maintain stability. Hence it may not be possible to meet the minimum access standard for generating system connected to a weak grid.

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S5.2.5.5

Reactive current injection. The proposed minimum and automatic access standard make reference to reactive current injection requirement for connection voltage reduction below 90%. Please consider adding the flexibility to have the requirement defined at the generating unit terminal for both the injection and the voltage drop. It is noted that the proposed recommendation already included allowance for assessing the reactive current contribution and voltage deviation at the LV terminals of the generating units.

Flexibility is also requested with regards to the voltage threshold upon which the current injection starts as many generating units may be configured to have the fault ride through function to start at below 90% voltage such as 80-85%.

Allowance for the current injection to cease when the voltage drops too low will also be needed. Typically for a type 3 and 4 machines, the current injection may reduce to zero below 20% of terminal voltage.

It must be highlighted that under certain scenarios such as weak grid connection, the reactive current injection may need to be limited to a low value or even zero, in order to avoid causing instability. Hence it may be prudent to qualify this requirement based on certain SCR at the connection point. For example, if SCR is less than 3, there should be no requirement for current injection during fault.

Thus for the capacitive current requirement, 2% as the minimum may still be too high under certain circumstances. Hence there needs to be allowance for even lower value under negotiated access. There must be a distinction in having the capability versus applying the capability in site specific case.

Regarding the requirement for inductive current under automatic and minimum, setting this at 6% minimum may not produce the best outcome for grid stability as this high k factor may create oscillations. Hence it is recommended to set the minimum access standard at a lower value than the automatic to ensure there is room for site specific setting under negotiated access.

Under the general requirements, the additional clause of requiring reactive power consumption upon a fault to not exceed 5% may be difficult to achieve under certain circumstances depending on the network connection, fault type, etc. More clarity is needed on this requirement to ensure it can be met under all applicable scenarios. The same concern is applicable on the clause for the active power consumption following fault occurrence.

Under the active power recovery clause, the requirement is acceptable under normal system but in case of weak grid, it will create issue as in weak grid the post fault active power recover has to be slowed down beyond 1000ms to suit the network specific capability. Hence meeting the minimum access standard may not be feasible under weak grid conditions.

S5.2.5.4

The proposed standard on multiple fault ride through should include clarification that once the multiple fault ride through capability is triggered within a 5-minute window, it will not be available

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again until sufficient time has elapsed to cool down the energy dump device. Typically, the full capability will become available again after around 30min period.

The proposed standard on high voltage ride through is acceptable for type 4 machines, but will exceed the capability of type 3 machines.

S5.2.5.11

The requirement under minimum access standard to increase in power transfer in response to a fall in power system frequency will require the generating system to run derated and will have economic impact on the commercial operation of the system.

Reference is to AEMO “Electricity Rule Change Proposal – Generator Technical Requirements” request to AEMC published in August 2017.

Please feel free to contact us should you require further information or other supporting documents.

Yours sincerely,

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