



13 July 2018

Mr Dominic Adams
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Dear Dominic

Re: GENERATOR TECHNICAL PERFORMANCE STANDARDS DRAFT DECISION – ERC0222

CitiPower, Powercor and United Energy welcome the opportunity to respond to Australian Energy Market Commission's (AEMC) draft decision on generator technical performance standards.

We broadly support the draft decision and the need to maintain power system security and quality of supply at the least cost to consumers. We support the draft changes to the connection negotiating framework and performance standards regarding frequency response, active power control and continuous uninterrupted operation.

Our response highlights the limitations of the draft performance standards regarding generator reactive power controls and proposes an alternative approach.

Generators should be commissioned to operate in one mode in the distribution network (66kV and below)

Generator voltage/reactive power control modes have limitations that adversely affect the efficient management of the distribution network. For example, generator voltage control may produce greater voltage variations in the network than alternate power factor control in cases of a sudden loss of generator or connecting line. In these cases, generator voltage control may compromise the distributor's ability to meet quality of supply obligations. Additionally, generator voltage control mode may, at distribution voltages, counter the normal droop voltage control mode used in many distribution substations. This would make generator voltage control ineffective on sub-transmission or distribution networks (66 kilovolts [kV] and below) where line drop compensated voltage regulation schemes apply.

The risk of adverse effects on the network is amplified if generators switch between operating control modes of voltage, power factor or reactive power control. Limitations of generator voltage/reactive power controls require distributor mitigation techniques specific to each generator and their operating mode. As the number of generators increases, the cost of mitigating the risk associated with generator voltage/reactive power controls under various operating modes would outweigh the limited benefit of generators operating under multiple controls. The risk associated with generators switching operating modes is higher on the distribution network compared to the transmission network, as the impact of voltage variations on end-consumers is more severe on the low-voltage network.

Additionally, the cost of modelling and testing multiple modes of control on the network would grow for each new generator. There is an increasing level of complexity required to model multiple control schemes for a new generator against all existing generators and their multiple control options to ensure the network operates effectively if one generator switches operating control mode. These costs should be weighed against the benefit of generators switching operating modes.

Therefore, even if generators are capable of multiple reactive power control modes, they should only be modelled, tested and commissioned in one voltage/reactive power control operating mode when first connected to the distribution network. The voltage/reactive control mode should have the highest voltage performance with regard to existing voltage regulations. This approach would ensure the cost of both

modelling/testing the operating mode and mitigating the risk on the distribution network is more in line with the overall benefit from generator controls.

Over time, generators can continue to model and test alternative operating modes with regard to the network state at the time and only be able to switch to alternative modes once appropriate modelling is complete and the alternative mode is approved.

Should you have any queries about our letter please do not hesitate to contact Sonja Lekovic on (03) 9683 4784 or slekovic@powercor.com.au.

Yours sincerely,



Brent Cleeve
Head of Regulation, CitiPower, Powercor and United Energy