



John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

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Dear Mr Pierce

GENERATOR TECHNICAL PERFORMANCE STANDARDS – DRAFT DETERMINATION

Origin Energy (Origin) welcomes the opportunity comment on the Australian Energy Market Commission's (AEMC) draft determination on generator technical performance standards. Our submission outlines several areas where adjustments to the standards should be made which will ensure a more equitable framework that better balances the costs a generator would incur with NEM system security requirements.

The new generator performance standards (GPS) represents a significant technical step change for generators and a shift in the negotiation framework between connecting proponents and AEMO/TNSPs. Under the new rules connecting generators are now required to provide supporting documentation as to why they do not meet the automatic standard. Additionally, the automatic standards have (in most instances) increased to meet system security requirements associated with a changing generation mix. This gives AEMO and the TNSPs greater scope to reject applications both on technical and system security grounds. Given the greater level of scrutiny and costs associated with meeting the new GPS, Origin would support the introduction of an independent third party that can arbitrate disputes on negotiated connection agreements.

Origin's key policy positions are summarised below:

- The transitional timeframe of 8 weeks is too short and is likely to result in some connection applicants having to respecify their units and reapply under a new set of generating performance standards (GPS). This will come at both a financial and time cost, delaying further investment in generation. Origin recommends that a suitable transitional timeframe is a minimum of 6 months from the date of the final determination.
- A number of aspects under the definition of continuous uninterrupted operation are disproportionate to the response required to maintain system security; this includes Over/Under voltage disturbances and multiple voltage disturbances. Origin believes that the automatic standards for riding through long periods of over and under voltage excursions are particularly onerous, especially the requirement to maintain voltage at 110%-115% for 20 minutes. Additionally, generators should be able to use transformer tap-changers to manage voltage and this should be added to the rule change proposal.
- Support amending the definition of continuous uninterrupted operation under Chapter 10 of the Rules that allows for a variation of reactive current injection or absorption during a fault, and allows for a reasonable variation of active power output and reactive power injection or absorption after the clearance of a fault.
- Support greater information provision from AEMO/TNSP on the reasons for a connection applicant failing a negotiated access standard. Origin recommends that an additional requirement is included in the Rules that requires AEMO or the TNSP to specify what changes could be made to a rejected application that will ensure a future application is successful.
- Support the inclusion of clause 5.3.4A(b)(1A) which maintains the GPS of existing generators when they are upgrading or changing their plant specifications, even where they fall below the new minimum standard.

Our detailed views on the above issues are set out below.

Transitional timeframes

The 8-week transitional timeframe does not allow sufficient time for connecting generators that are in the final stages of securing their GPS, to complete their connection agreements under the existing rules. The AEMC has allowed 2 weeks to assess the impact of the new standards and 6 weeks to negotiate with AEMO/TNSPs. If the proposed finalisation date is September or October, the transition timeframe will approach the Christmas shutdown period, likely resulting in delays to applications. Additionally, the timeframe does not account for delays in specialist engineering advice or any further modelling requirements. This will ultimately result in a greater number of connection applicants who will have to reassess the financial viability of their generator under the new GPS.

Connection applicants have undertaken detailed technical designs and financial assessments of their proposals in good faith, under the existing set of generator performance standards, and this timeframe does not honour those commitments. Additionally, imposing a large unknown cost onto a 'close-to-committed' project, at short notice, is not a reasonable approach. The AEMC should allow all connecting parties a fair period of time to understand and model the impacts of the new GPS before commencing the new rule. Origin suggest that an appropriate timeframe would be 6 months.

Applying a minimum timeframe of 6 months from the date of determination will allow generators to transition in an orderly manner, provide sufficient time for AEMO/TNSPs to process applications, likely have minimal impact on system security and provide investment certainty to those generators who developed their application based on their knowledge of the GPS at that time.

If the 8 weeks is maintained, it is likely that there will be a delay in the introduction of new generation because a connecting proponent will have to redesign the technical capability of their generator. This process includes: tendering for new equipment, undertaking technical evaluations of the new equipment, assessing the financial impact of the new GPS, updating modelling requirements and undertaking a new board approvals process. This all results in delays for generators of between 6 and 12 months which will have flow on cost implications for the NEM. We note that futures prices increased upon the release of the draft determination which are likely attributed to the market factoring in near term project delays.

Continuous Uninterrupted Operation

Over-voltage and under-voltage disturbances (clause S5.2.5.4)

Origin believes that the automatic standards for riding through long periods of over and under voltage excursions is particularly onerous, especially the requirement to maintain voltage at 110%-115% for 20 minutes.

This will impact heavily on generator design, transformer design and auxiliary systems and comes at a considerable cost given the infrequent nature of voltage excursions. Origin would like to see the duration times in the automatic standards lowered.

An additional change that should be introduced into the Rules is the ability for generators to manage voltage excursions using their own tap changing transformers. This will aid in a generators ability to manage voltage disturbances at a lower cost.

Finally, Origin believes that these standards represent a duplication of the systems that are already provided by TNSPs through their network responsibilities. Currently networks correct steady state voltage excursions using network assets including tap changing transformers and this should continue. Requiring generators and TNSPs to manage long duration voltage excursions introduces an N-2 level of redundancy that is excessive. With this in mind, Origin believes this justifies reducing the automatic standard on over/under voltage disturbances on generators.

Multiple Voltage Disturbances

Origin understands that synchronous generators would have great difficulty in meeting the proposed automatic and minimum standards with respect to multiple low voltage disturbances. The requirement to ride through up to 15 faults in 5 minutes without disconnecting plant will place an unreasonably high level of stress on the generators and auxiliary systems (e.g. transformers), which may lead to higher rates of plant failure and outages.

The proposed number of faults and levels appears to not account for actual plant operation and has been based on theoretical models that do not accurately represent long term plant integrity, maintenance, and auxiliary systems. Maintaining plant to cope with high levels of faults will come at a considerable cost to generators, increasing the cost of supply. There is also an added safety risk for

plant personnel who would be subject to greater risks if the plant is required to operate on the very edge of its technical design.

Additionally, the new negotiating framework would also make it very difficult for connecting applicants to justify only meeting the minimum standard as AEMO could easily reject an application based on system security, even though these are very rare events.

Greater information provision

It has been Origin's experience from previous connection applications that the rejection of negotiated standards is not always supported by evidence or reasoning. Thus, Origin supports the draft rule that requires AEMO/TNSPs to provide to the connection applicant detailed reasons for either rejecting a proposed negotiated access standard or requiring connection applicants to provide additional evidence to support proposed negotiated access standards.

Origin would welcome an additional rule that requires AEMO/TNSPs to specify what adjustments to the connection agreement would be required which would allow the GPS to be approved. By specifying which parts of the application need to be strengthened and detailing why, it prevents a back and forth negotiation between all the parties. This provides an advantage of reducing the negotiation time and added costs in having to obtain multiple modelling or engineering consultant reports. It could also form the basis of an assessment by an independent third-party expert, if the connection application is rejected despite meeting the stated requirements of AEMO/TNSP.

Maintenance of existing GPS

Origin welcomes the addition of clause 5.3.4A(b)(1A) that allows the use of a generator's existing GPS as the basis for a minimum standard. The addition of this clause will ensure that generators looking to upgrade control systems or make plant changes can do so confident in the ability to meet a revised GPS at a reasonable level.

One area that should be exempt from a review of a generator's GPS is where changes are made to protection relays or remote control and monitoring systems that do not materially affect a generator's performance. One example is replacing protection relays but keeping the existing protection settings.

Other technical provisions

Reactive Power Capability

Origin supports the decision to not mandate a minimum level of reactive capability. Consideration should be given to unit size and local grid conditions.

Reactive Power Control

Origin's preferred approach for voltage regulation is to operate generators in voltage control mode and use the generator transformer tap changer to control reactive power flows and network voltages.

Consideration should be given to unit size in determining whether a voltage control mode is required. It would make little economic sense to require small units that cannot influence voltage to have this capability or operate in this mode.

Reactive current response during disturbances

Given the variation in inverter manufacturers, it would dramatically reduce competition and increase inverter costs if systems of all sizes (i.e. total plant capacity <5 MW) are required to have a reactive current injection during disturbances. Origin anticipates that smaller systems would also provide little benefit to system security in these circumstances.

Should you have any questions or wish to discuss this information further, please contact James Googan on james.googan@originenergy.com.au or (07) 3512 4138.

Yours sincerely,



Steve Reid
Group Manager, Regulatory Policy