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Submitted by email to mass.consultation@aemo.com.au

Re. MASS Consultation Issues Paper, January 2021

To whom it may concern,

Thank you for the opportunity to respond to this important Issues Paper.

By way of introduction, VIOTAS is a market-leading smart grid technology and demand side services company headquartered in Limerick, Ireland and we have recently established an office in Melbourne. We are passionate about enabling a low carbon future by leveraging smart grid technology to accelerate the use of renewable energy worldwide and have a dedicated in-house team developing the leading-edge technologies that underpin our services to meet the ever-changing needs of our customers and the power system.

This written response to the Issues Paper includes combined submissions on both the “DER MASS review” and “General MASS review” components. See enclosed below detailed submissions from VIOTAS, structured according to the specific consultation questions set out in the Issues Paper. While VIOTAS has not responded to every question within the Issues Paper, we have clearly highlighted where this is the case.

If you require any further information on this submission, please contact me by email on william.salis@viotas.com or by telephone on 0403 613 243. VIOTAS is more than willing to have a follow up discussion with AEMO on any of the topics contained within this consultation response.

Yours sincerely,



William Salis
Market Operations Manager
VIOTAS

Question 1: DER measurement requirements options

Which option for the ongoing measurement requirements for DER described in Section 2.3 do you want AEMO to implement and why? Should any other options be considered?

Summary of the two options presented:

- **Option 1:** leave the measurement requirements in the current MASS unchanged (50 ms data resolution metering for power and frequency at each NMI to provide Fast Contingency services, measured at, or close to, the connection point);
- **Option 2:** embed the VPP Demonstration measurement requirements in the MASS (enabling 1 second power / frequency metering resolution and verification using measurements captured at the controllable device instead of the connection point).

VIOTAS would like to consider the two key elements of this item in turn:

1. **Measurement resolution.** Measurement requirements need to be appropriate to the service being provided and, while 1 second data resolution is sufficient for slower services, where participants are being paid for providing fast responses maintaining millisecond resolution data is an important requirement to ensure AEMO has sufficient resolution to validate response.

As the power system continues to transform, faster response services such as Fast Frequency Response will be required, and maintaining the highest standards of metering and verification will become increasingly important. Developments in the utilisation of ultra-fast response services are being seen in markets worldwide, as system operators work to manage their power systems with very high penetrations of non-synchronous renewable generation and reduced levels of inertia. Amending the MASS to allow potentially large volumes of controllable capacity to be deployed with low resolution measurement is likely to reduce the flexibility available as the system develops and progressively faster service requirements become increasingly prevalent. VIOTAS believes the benefits of increasingly fast services are sufficient that there is significant merit in retaining the MASS measurement requirements, and mandating that service providers deploy the highest standard power meters and control systems that are capable of both faster response speeds and the associated monitoring and verification.

VIOTAS believes it is important for ancillary services minimum technical requirements to be as broad as possible (enabling the widest possible range of providers) but for these to be complemented by strong price signals to incentivise the service delivery characteristics of highest value to the system. If faster responses are of higher value to the system, providers which can both provide and verify faster response should be paid more. In the Irish market for example, Fast Frequency Response requires full response within 2 seconds (allowing a wide range of providers), but payment is subject to a scalar which rewards providers who can respond within 150 ms threefold vs. a provider who can only meet the minimum 2 second requirement. Allowing service providers to be deployed with lower standard metering systems may preclude the subsequent implementation of such market designs in the NEM, as these providers would be unable to measure or verify their performance with sufficient resolution.

VIOTAS believes there is considerable merit in retaining the high speed (50 ms) metering capability requirement for participants providing fast contingency FCAS. As the critical element of these services is delivered within 6 seconds of a frequency event, being able to measure the frequency and power flows with high resolution during this period is a critical element of verification.

2. **Measurement location.** VIOTAS sees potential merit in allowing providers to verify FCAS delivery using metered power data captured at the controllable device level, rather than the connection point, as proposed in the Issues Paper.

This would be particularly helpful for controllable loads which share a NMI with other variable loads not providing FCAS. For example normal demand changes from other on-site loads during an assessment period may lead to the measured response at the connection point deviating from that delivered by the controlled device. Where any such normal demand changes from other on-site loads are unrelated (i.e. not deliberately negating the controlled response), there is significant advantage in measuring and verifying service delivery at the controlled device itself. However, while straightforward this places a greater onus on trust in the provider. VIOTAS recommends that, if measurement at the controllable device level is allowed, it will remain important to require providers to measure power flow at the connection point to enable periodic validation by AEMO that the connection point response (even if with lower data resolution) matches that expected based on the controlled device's response.

VIOTAS also recommends the existing MASS is clarified to remove any potential ambiguity as to under what circumstances AEMO will enable power flow measurement at a point other than the relevant connection point. For example:

- Clauses 3.6, 4.6, and 5.6 of MASS v6 state that for all Contingency FCAS services “power flow [...] must be measured at or close to the relevant *connection point* or, if otherwise agreed with AEMO, sufficient measurements may be provided to calculate the Generation Amount or Load Amount”, however it is not clear how “sufficient measurement” is defined, nor under what circumstances AEMO will enable power flow measurement at a point other than the relevant connection point.
- Clause 2.4(i) of MASS v6 states that, for aggregated ancillary service facilities “where a relevant plant that forms part of an Aggregated Ancillary Service Facility shares a *connection point* with a variable *load or generating unit*, it is the gross power flow to or from the relevant plant that forms the aggregated response and must be directly measured.” VIOTAS requests further clarification on exactly how this should be interpreted.

Regarding the additional conditions that are proposed that would apply to providers electing to capture measurements at the controlled device rather than at the connection point, VIOTAS does not believe these are sufficiently defined, and requests that AEMO provide further clarity / explanation in this regard. For example, “*Power flow measurements from the controllable device and generating units behind the connection point, and the grid flow must also be captured*” implies power flow measurements at the connection point are still required. To what measurement resolution are these required? Does AEMO expect revenue metering to provide this measurement, or additional metering?

Question 2: DER measurement requirements options – consistency with the NEO

Which option do you think is more consistent with the NEO, and why?

VIOTAS believes, on balance, Option 1 (no change to the MASS measurement requirements) is the most consistent with the NEO. VIOTAS believes upholding the highest standards of metering and control for the provision of ancillary services. Particularly as the power system continues to require faster response and more sophisticated services such as FFR and inertia, which will result in the best long term outcome, both for the NEM power system (in terms of reliability, safety and supply security), and for end-consumers (in terms of maximising the utilisation of all available resources and the associated benefits in terms of competition, efficiency and prices).

Question 3: Principles to guide AEMO’s assessment of the proposed DER measurement options

Should AEMO consider any principles other than those described in Section 2.4 to guide its assessment?

VIOTAS does not have any additional principles beyond those described in section 2.4 which recommends AEMO consider as part of its assessment. VIOTAS believes the first principle (“ensuring that the delivery of FCAS from DER can be reliably verified to identify non-compliances and minimise potential for gaming”) is the most critical. This ensures a level playing field amongst providers and ensuring that, where participants are providing a service, being paid for it and relied upon by the system to provide it, they are able to appropriately demonstrate / verify that they have provided it, with a degree of accuracy appropriate to the service.

Question 4: Implementation costs for 50ms vs. 1 second data resolution per NMI

What is the difference in costs, such as updating communication links or installing additional equipment, for capturing data at 50 ms vs. 1 second resolution for every NMI for different VPP facility types? Is the cost difference prohibitive for participating in Contingency FCAS? Provide examples or analysis if possible.

VIOTAS proprietary VIO Link metering and control technology has, as standard, the capability to measure both frequency and active power with a 20 ms resolution (which is in excess of the minimum resolution required in the MASS for the provision of Fast Contingency services, however VIOTAS anticipate long term this requirement may change). This system is designed and developed completely in-house to enable the provision of high speed ancillary services and the validation of the resulting response, and has high speed communications capability back to VIOTAS central systems.

VIOTAS is developing a new system which will enable increased viability of providing ancillary services with progressively smaller controllable loads. This product will retain the ability for high resolution data capture and communications. Therefore, VIOTAS believes the cost differential between 50 ms and 1 second data resolution does not constitute a sufficiently high barrier to the participation of small sites.

Question 5: DER measurement requirements options – impact on market competition

Do you think that either of the options presented will result in more or less competition in the Contingency FCAS markets?

Any benefit associated with implementing Option 2 in terms of enabling additional participants to participate in providing FCAS services (and the associated potential increases in competition), needs to be carefully balanced against any potential system reliability implications of reducing the stringency of the technical requirements associated with providing the services, in particular the Fast Contingency FCAS services. In addition, creating multiple measurement / verification standards for different participants providing the same service risks creating a market distortion.

Question 6: Technical risks associated with DER measurement requirements Option 2

Are there any technical risks that you envisage if the Option 2 measurement requirements are allowed? How material do you consider those risks and how could they be efficiently mitigated?

As set out in our response to question 4, key risks associated with implementing the Option 2 measurement requirements include:

- 'Locking in' significant deployments of service capability with lower specification metering and control technology that is not best suited to providing increased response speeds for future services or to delivery assessment using scalars to remunerate providers based on actual response speeds;
- Actual service volumes delivered and measured by lower resolution data systems in accordance with relaxed verification requirements, may fall short of that which the system has paid a particular participant to provide;
- Intentional or unintentional response from other assets behind the same NMI may fully / partially negate the response measured at the controlled device.

Additional details on these risks and their effective mitigation are included in the response to question 4 above.

Question 7: Market distortion impact of 1 sec vs. 50 ms data resolution

Does the sampling rate of 1 second rather than 50 ms for Fast Contingency FCAS under Option 2 and the determination of the FCAS delivery at the controllable device level create market distortion or negatively impact FCAS markets?

Care must be taken to ensure that creating different measurement requirements for different providers of the same service does not create a market distortion. For example, reducing data resolution measurement requirements for sites with up to 1 MW per NMI may create an incentive for such sites to preferentially select a service provider with lower specification equipment, if this results in a cost saving. Creating a disincentive for such relatively large sites to deploy state of the art metering and control technology is unlikely to be desirable, and would present a significant market distortion. Accordingly, analysis is required to ensure that any such threshold below which a site can avail of reduced measurement standards does not create an incentive for sites whose participation in ancillary services would have been commercially viable with state of the art systems to instead be locked in to less sophisticated technology.

There is an additional risk of distortion if a discrepancy in ability to utilise an alternative measurement location is created between different service providers. For example, a provider with a 1 MW controllable load which is verified at the connection point is likely to have to build in a certain conservativeness in its bidding behaviour to ensure that, irrespective of any other unrelated load changes that may occur at the site (behind the same NMI) it is still able to deliver the committed service volume. This will not be the case for a provider whose performance is verified at the controlled device, and this risks creating a market distortion between providers.

Any such distortion must be minimised to ensure that the benefits in terms of reduced entry barriers for smaller sites and associated increases in competition, justify any potential negative impacts of the distortions inevitably caused by creating multiple measurement standards for different providers of the same service. VIOTAS recommends that fairness and equity of treatment between providers are paramount, alongside other considerations such as reducing barriers to entry for smaller service providers.

Question 8: Maximum size threshold (MW per NMI) for alternative measurement option

If Option 2 was adopted, should the changes to the measurement requirements be limited to small-scale DER (< 1 MW per NMI), or should a different threshold apply, such as 5 MW? What do you see as the risks and benefits of expanding these measurement requirements to other FCAS providers and in what circumstances?

VIOTAS agrees with AEMO's proposal that, if adopted, any measurement requirement relaxations should only be permitted for ancillary service loads below a certain threshold. This will ensure an optimal balance between reducing barriers to participation by aggregations of smaller sites, while also ensuring that the current high resolution measurement standards are retained for larger sites which have a greater impact on the power system. VIOTAS recommends two distinct thresholds if AEMO decides to adopt Option 2:

- **A 200 kW threshold** for reduced measurement resolution (1 sec). In other markets VIOTAS already provides fast response ancillary services using controllable loads smaller than 500 kW per site and as set out in our response to Question 4 VIOTAS is in the process of developing technologies that enable it to do so using progressively smaller loads without sacrificing high resolution data measurement and verification capability. Therefore, VIOTAS recommends that, if Option 2 is adopted, AEMO reduces the threshold to 200 kW per NMI below which providers can avail of reduced data resolution measurement requirements. This will reduce the barrier to entry for very small sites (e.g. aggregations of residential properties) while still requiring that larger sites require more sophisticated technology to participate. This will avoid 'locking in' less sophisticated monitoring and control technologies, and will drive future system benefits as the services procured evolve.
- **A 5 MW threshold** for relaxed measurement location requirements. VIOTAS believes that, if implemented, the merit in enabling FCAS provision to be verified at the controlled device is also be worth extending to larger sites up to 5 MW per NMI. If this option is adopted it will be important to implement robust processes (such as periodic spot checks to validate delivery data measured at the controlled device vs. that measured at the connection point) to ensure no perverse incentive is created for gaming to deliberately negate the response with other on-site loads behind the same NMI.

VIOTAS understands these thresholds (200 kW and 5 MW) are commonly used by networks for embedded generation to classify a system as either 'small' or 'large'. Similarly, these thresholds are mirrored in Australian Standards, for example AS4777 and AS5139. VIOTAS believe consistent classifications across the industry (albeit informal) make for an efficient, equitable and technology agnostic electricity system.