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Ms Andrea Marinelli
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Australian Energy Market Operator
via email: contact.connections@aemo.com.au

Dear Ms Marinelli

Review of technical requirements for connection (NER clause 5.2.6A)

Thank you for the opportunity to comment on the consultation report, *AEMO review of technical requirements for connection under Schedules 5.2, 5.3 and 5.3a of the National Electricity Rules, Draft Report* (the Draft Report).

As AEMO is aware, Marinus Link Pty. Ltd. (**MLPL**) is developing Marinus Link, a second high voltage direct current (**HVDC**) interconnector between Tasmania and Victoria. Marinus Link is proposed to comprise two 750 MW symmetrical monopole HVDC links, each utilising voltage source converter (**VSC**) technology. Marinus Link is an actionable project in AEMO's 2022 Integrated System Plan.

MLPL is registered as an intending transmission network services provider (**TNSP**), and has first-hand experience in navigating the challenges posed by the absence of clear technical requirements in the National Electricity Rules (the Rules) relating to HVDC systems that are not Market Network Services. Furthermore, in writing this submission, MLPL is able to draw on knowledge obtained from expert consultants and via discussions with suppliers of HVDC systems.

Whilst the scope of the Draft Report considers technical requirements of both Schedule 5.2 and Schedule 5.3a of the Rules, this submission only provides comments on Schedule 5.3a.

The key points in MLPL's submission are:

- MLPL is supportive of performance standards applicable to HVDC systems in general.
- Caution should be exercised in simply changing the applicability of Schedule 5.3a from being based on Market Network Service participant registration to that based on HVDC plant type. This may result in unintended consequences, and there may be consequential drafting amendments required in order to support AEMO's recommended change of applicability. This is consistent with AEMO's proposed approach in recommending the change of applicability of Schedule 5.2.
- Transitional arrangements for projects already underway must be considered when AEMO proposes draft Rules in its next stage of consultation.
- We make some comments on specific access standards proposed for HVDC systems. In general MLPL supports the changes to access standards proposed.

MLPL would be pleased to provide further information on any aspect of this submission. For any enquiries, please contact Paul Rayner, paul.rayner@marinuslink.com.au.

Yours sincerely,

Stephen Clark

Stephen Clark

Project Director – Marinus Link

MLPL supports the introduction of performance standards for HVDC plant

MLPL considers the current applicability of Schedule 5.3a to MNSPs leaves a shortcoming in the Rules, in that it is unclear what detailed technical standards apply to HVDC systems owned by participants who are not MNSPs. It is entirely probable that future HVDC systems could be developed by TNSPs[1], Generators, or as Designated Network Assets. The latter two categories could conceivably apply for off-shore wind generation developments located where an AC connection to the primary transmission network is technically unviable. In MLPL's view, the currently applicable performance standards would be:

- For TNSPs: Schedule 5.1 applies. Schedule 5.1 applies to all TNSPs, but the requirements of Schedule 5.1 were written with reference to meshed AC transmission or distribution networks. Whilst not originally envisaged, many aspects of Schedule 5.1 can be applied to HVDC systems. The Schedule 5.1 criteria most pertinent to HVDC systems, e.g. S5.1.8 Stability, are not specified at the level of detail typically expected for HVDC systems and their application is reliant on agreement between relevant TNSPs via the joint planning framework. The fact that MLPL has been able to develop a HVDC specification, which includes performance requirements agreed via the joint planning process, is evidence that the TNSPs can progress HVDC systems under the current Rules framework.
- For Generators: Schedule 5.2 applies. The majority of requirements in Schedule 5.2 apply to *generating systems*, the definition of which could include an HVDC system on the Generator's side of the connection point. Some aspects of S5.2.5 apply specifically to *synchronous generating units* or *asynchronous generating units*, neither of which include HVDC systems. This leaves some ambiguity regarding performance requirements for HVDC systems owned by Generators.
- For Designated Network Assets, the functional performance would be specified by the primary TNSP. The lack of clear HVDC performance standards may prove problematic if the primary TNSP and the Designated Network Asset developer have different views of the level of performance required. In the case of a Designated Network Asset, the joint planning process does not apply.

Whilst MLPL does not consider the current Rules requirements to be unworkable, we acknowledge that the lack of clarity could lead to protracted negotiations and consequent project delays. The existence of access standards for HVDC systems has the potential to alleviate this situation. We note, however, that automatic access standards must be set at levels that can be readily achieved by modern HVDC equipment, otherwise negotiated access standards will prevail. The requirement to reach agreement on a large number of negotiated access standards may be no improvement on the current situation.

As a corollary, AEMO's Draft Report recommends applying Schedule 5.2 based on plant type rather than participant registration category. Should this recommendation be enacted, a clear need would exist to ensure performance requirements of HVDC plant (not owned by a NSP or MNSP) is specified within the Rules, given HVDC is not a plant type covered in Schedule 5.2.

[1] It is also possible, although less likely, that a DNSP could develop a HVDC System if it was found to be the preferred option via a RIT-D. To simplify wording, this submission only considers the possibility of TNSPs implementing HVDC systems, however MLPL acknowledges that any reference to a TNSP or RIT-T could also include a DNSP or RIT-D.

A simple change of applicability of Schedule S5.3a may have unintended consequences

AEMO's Draft Report recommendation in respect of S5.3a.1a is to apply the requirements of the schedule to all to HVDC systems irrespective of registration classification.

Whist MLPL supports performance standards for HVDC systems, we urge caution in taking the approach of simply making S5.3a applicable to all HVDC systems, since this may have unintended consequences. We note that in its discussion of the application of S5.2 on the basis of plant type instead of registration category, AEMO has highlighted that its preferred solution (Option 3) involves

> "extensive drafting and detailed consideration of consequential amendments",

as well as

> "clarification of the application of standards that involve the agreement or approval of the NSP in cases where the NSP itself is the operator of the relevant plant"

MLPL considers that this same situation applies to Schedule 5.3a. We highlight some issues below.

Concurrent applicability of Schedule 5.1 and Schedule 5.3a

If the HVDC system is being developed by a new entrant TNSP who will not own a meshed AC network (as is the case with Marinus Link), is that TNSP also required to comply with the requirements of S5.1? Similarly, if an incumbent TNSP pursues an HVDC option for network expansion/augmentation, do the requirements of both Schedule 5.1 and Schedule 5.3a apply to that expansion/augmentation? MLPL has considered whether each of the requirements of S5.1 can be applied to HVDC systems, and found

- some requirements are only applicable to AC networks (e.g. S5.1.7 - Voltage unbalance);
- some requirements can be applied to HVDC, but only at a generic high level (e.g. S5.1.8 - Stability); and
- some requirements can be equally applied to either HVDC or AC networks (e.g. S5.1.3 – Frequency variations).

Furthermore, for those Schedule 5.1 requirements that could apply to either AC or HVDC systems, care must be taken to ensure that conflicting requirements do not result from the concurrent application of Schedule 5.1 and Schedule 5.3a.

AEMO has recommended the re-framing of the application of both S5.2 and S5.3a on the basis of plant type instead of than the connecting party's registration category. Consideration should be given to whether S5.1 should also be re-framed to apply only to AC networks. This would ensure clarity in those technical requirements which apply to HVDC networks and those which apply to AC networks.

Alternatively, case-by-case exceptions to S5.1 could be proposed, but this seems a more cumbersome approach.

Alternative solutions to meet minimum technical performance requirements

An HVDC system developed by a TNSP will ultimately be funded by consumers via transmission use of services (**TUoS**) charges. There may be situations where a performance outcome intended via the access standards for HVDC systems could be obtained more efficiently by an investment elsewhere in the AC transmission network despite the minimum access standards for HVDC not being met. In this case, insistence on the minimum access standards for HVDC would not further the NEO. Note that this situation only arises in cases where a TNSP is implementing the HVDC system.

For example, S5.3a.11 relates to harmonic performance, and would typically be used to ensure HVDC systems include suitable filters to limit their harmonic injection onto the AC network to less than an allocation specified by the connecting TNSP under S5.1.6. The harmonic allocation limits specified by the connecting TNSP account for existing network users and potential future connections. The TNSP sets the allocations such that, if all existing and future network users maintained their harmonic injection below their allocation limits, harmonic planning levels for that part of the network are not breached.

However, it may be the case that, considering existing network users only, a modern HVDC system would not cause the planning levels to be breached even if no harmonic filters were installed[2]. Furthermore, it is also possible to mitigate harmonics by installing harmonic filters nearby in the AC network. Bearing in mind that the costs of filters in the HVDC system or filters in the AC network would both be recovered via TUoS, it is arguably more efficient in this situation to not install any filters initially, and then implement the most cost effective mitigation option at some future time when the need for harmonic mitigation is triggered via new connections. This is based on the assumption that the connecting TNSP has made a suitable allowance in its revenue application and is able to recover costs via TUoS. Note that this is consistent with the approach a TNSP takes when implementing a STATCOM: don't implement harmonic mitigation measures, which are funded by customers, until the need actually arises.

A blanket application of S5.3a.11 to all HVDC systems would not permit this approach. There may be other situations in which the NEO may be better served by implementing AC network solutions as opposed to HVDC minimum access standards when a HVDC link is being implemented by a TNSP. MLPL urges AEMO to consider such possibilities when considering consequential amendments to the Rules if Schedule 5.3a is applied to all HVDC systems.

Application of Efficient Management of System Strength Rule Change

The 2021 Rule change *Efficient management of system strength on the power system* introduced new obligations on generators, loads and MNSPs in relation to remediation of their system strength impacts and the costs associated with such impacts. Notably, these requirements do not apply to equipment owned by TNSPs and DNSPs, despite some such equipment (e.g. STATCOMs) having an inherent system strength requirement.

The AEMC has not explicitly stated its reasons that the remediation requirements do not apply to TNSPs and DNSPs. It is reasonable to assume, however, that application of the requirements to TNPSs/DNSPs would result in a requirement to calculate and administer payments between NSPs. The final costs of such payments would ultimately be borne by end use customers via TUoS/DUoS regardless, making the process an inefficient use of resources and not supporting the NEO. It is assumed that the AEMC considered that the joint planning process will adequately address the most efficient mechanism to remediate any system strength impacts of TNSP/DNSP owned equipment.

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[2] Refer to discussion "HVDC inverter technology differs from wind, solar and BESS inverter technology" (later in this submission) for further details of low harmonic emissions of modern HVDC systems.

MLPL considers that joint planning is the most appropriate way to deal with system strength requirements of TNSP owned HVDC systems. There may be circumstances in which it is more cost effective to mitigate an HVDC system's system strength requirements using equipment located in the AC network, rather than incurring additional costs in the HVDC system. The joint planning process allows flexibility to accommodate such options.

Should the requirements of Schedule 5.3a be applied to all HVDC systems, then the short circuit ratio requirements of new S5.3a.7 would also apply to TNSP owned HVDC systems. S5.3a.7 requires a plant capability sufficient to operate stably and remain connected at a short circuit ratio of 3.0. MLPL is of the view that modern VSC HVDC systems would be able to achieve this performance standard. Its application to TNSP owned HVDC systems may theoretically contradict the optimal joint planning outcome argument above, but in practice such a mandatory requirement would be of no consequence. MLPL would therefore support a minimum short circuit ratio of 3.0 being applicable to all HVDC systems, irrespective of ownership.

MLPL is not aware of any other circumstances in which the application of S5.3a to all HVDC systems would conflict with the *Efficient management of system strength on the power system* rule change. However, we urge AEMO to satisfy itself that this is indeed the case prior to formulating draft Rule changes.

HVDC behind a Generator connection point

Figure 1 illustrates a hypothetical off-shore wind farm connected to the NEM AC transmission network via a HVDC link. The generating system comprises a HVDC link, an offshore substation, various wind generation feeders and synchronous condensers to provide the required system strength at the off shore AC grid.

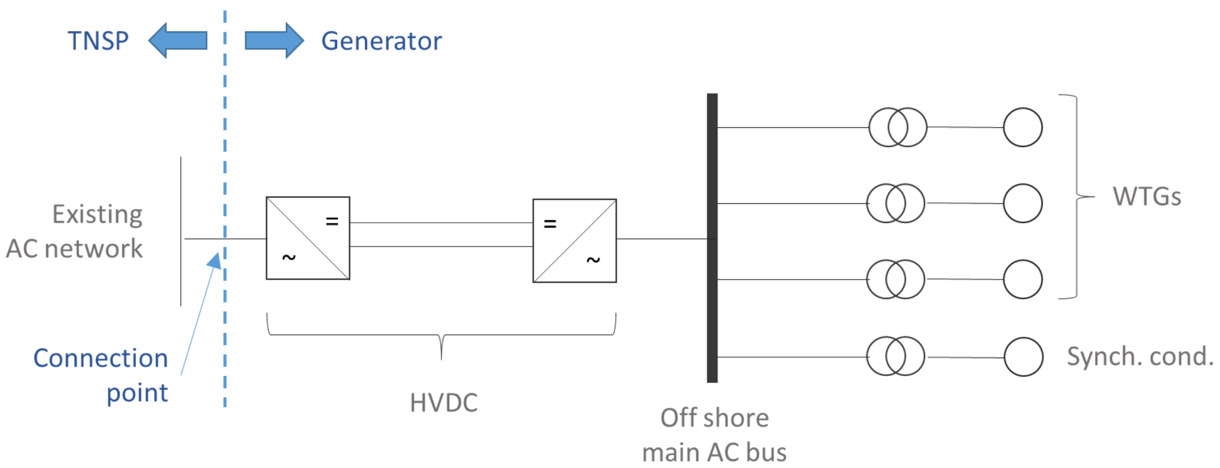

Figure 1 – Hypothetical HVDC connection to an offshore wind farm. The HVDC link forms part of the generating system.

If the technical requirements of S5.2 and S5.3a were applicable to plant type, there would be three types of plant behind the generator's connection point to which performance standards would apply: the HVDC network, the wind generating units and the synchronous condensers. However, with this generating system topology, many of the characteristics of the wind generating units and the synchronous condensers have no bearing on the electrical performance at the connection point. This is because the HVDC system isolates the connection point from many characteristics of the off-shore AC network. Provided the off shore AC bus maintains stability and allows the stable transmission of power over the HVDC link, the contributions from individual plant items are not relevant. Such characteristics include, but are not limited to:

- reactive power capability of the WTGs, synchronous condensers and off-shore HVDC converter;
- quality of electricity generated at the off shore AC bus;
- voltage and reactive power control of the generating units and synchronous generating units;
- frequency control of generating units;
- frequency operating standards applicable to the WTGS, synchronous condensers and off-shore HVDC converter. (It is not even necessary that the offshore AC network operates at 50 Hertz nominal frequency.)

The only performance requirements that matter from a power system stability and security perspective are those that apply at the connection point. Any performance of the off shore plant that is more costly than the minimum performance required to ensure adequate performance at the connection point would not support the NEO.

MLPL recommends that in proposing a change of S5.2 and S5.3a to plant type based performance requirements, AEMO considers how exceptions to the technical performance requirements for individual plant items can be made in situations where individual plant performance characteristics have no impact on the performance at the connection point.

Transitional arrangements must be considered

The Draft Report does not consider transitional arrangements regarding the change from the existing performance standards to new performance standards. MLPL acknowledges that this is appropriate at this point in the review process.

AEMO has identified that the next stage in this review will be consultation on draft Rules changes. MLPL requests AEMO to consider transitional arrangements when formulating these draft Rules.

Connecting parties would normally be expected to meet the performance standards that apply at the time of submitting a connection application. Marinus Link has been progressed to date via the joint planning process, and MLPL has not submitted formal connection applications. MLPL has completed a technical specification for Marinus Link, collaborating with both connecting TNSPs in the process. At the time of writing this submission, the tender for Marinus Link is underway. MLPL expects final tender offers will be received well in advance of any Rules changes arising from this review.

Whilst the technical specification for Marinus Link is largely aligned with the HVDC recommendations in the Draft Report, the final drafting of the resulting technical requirements is not yet known. Any externally imposed unexpected changes to the technical requirements of Marinus Link may have a significant adverse impact on the project. MLPL therefore requests AEMO to explicitly propose transitional arrangements which would not compel a HVDC project as advanced as Marinus Link to be bound by the new technical requirements.

Comments on particular performance requirements

This section provides MLPL's feedback on the technical performance requirements for HVDC systems. We firstly make two general observations, then discuss specific performance requirements.

HVDC inverter technology differs from wind, solar and BESS inverter technology

MLPL would like to draw AEMO's attention to a statement in the Draft Report which we believe is incorrect,

> "The VSCs used for modern HVDC systems operate with the same principles as the VSCs used in solar, wind and BESS."[3]

The inverters used in solar, wind and battery storage systems typically utilise pulse-width modulation (PWM) technology. PWM generates a square wave of rapidly changing mark/space ratio, which can be filtered to create a 50 Hz sinusoidal voltage. Filtering is inherently necessary in PWM systems.

Modern voltage source converter HVDC systems typically use modular multi-level converter (MMC) technology. MMC uses power electronics to rapidly switch capacitors in and out of a series chain, with the effect that the sum of the capacitor voltages varies in a sinusoidal manner. Typically hundreds of capacitor "submodules" are connected in series, with the result that the output voltage is an extremely good approximation of a sinewave with very little harmonic content. Little, if any, filtering is needed.

Details of control of MMC submodules is the intellectual property of HVDC manufacturers. Whilst MLPL is aware of one major difference between MMC and PWM inverters being the filtering requirements, there may be other implications of which MLPL is unaware. The key point is that it is not appropriate to consider that solar, wind or battery inverters can inherently provide similar performance to VSC HVDC systems on the basis that the same principles apply to both.

Automatic access standards must be readily achievable with standard design solutions

AEMO has acknowledged the possibility of increased usage of HVDC in the NEM to support its transformation to renewable generation sources. MLPL's experience is that an increased demand for HVDC is occurring worldwide, with the result that demand for HVDC systems is greater than suppliers' delivery capacity. There is no indication that this situation will change in the foreseeable future.

To effectively support timely integration of HVDC systems, the proposed HVDC access standards must be set at levels that manufacturers can readily meet with their standard design offerings. At times of supply scarcity, manufacturers have less incentive to create bespoke solutions for particular projects. Whilst a negotiated access standard lower than the automatic access standard (**AAS**) may be at a level that manufacturers can readily meet, the need to negotiate such a standard has time and resource implications for both the HVDC system proponent and connecting TNSPs. The preferable situation would be

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[3] This or similar statements occur in the Draft Report on pp. 96, 97, 100.

automatic access standards that support the secure and stable of the power system, and can be readily met by HVDC manufacturers standard product offerings.

S5.3a.8 – Reactive power capability

AEMO has recommended aligning the requirements of S5.3a.8 with the generator requirements proposed for S5.2.5.1.

Setting aside proposed voltage and temperature dependant variations, the basic generator automatic access standard is that the generating system is capable of supplying and absorbing continuously an amount of reactive power greater than 0.395 times the rated active power of the generating system. This equates to a power factor of 0.93.

MLPL's experience is VSC HVDC systems are typically designed to support a power factor of 0.95 (i.e. reactive power of 0.329 times maximum the maximum active power). Whilst a lower power factor could be achieved, this results in additional expense in terms of greater volume of power electronics to support the higher current required, with consequential impacts of an increased size of the converter hall building.

Unless it can be readily demonstrated that there is a clear power system requirement for the generator performance standard of 0.395 times maximum power output to be applied to HVDC systems, MLPL recommends that the automatic access standard for HVDC systems be set at 0.329 times the maximum active power.

MLPL supports the following changes to reactive power capability recommended for generators, and considers these should also be made applicable to HVDC systems:

- reduction of reactive injection capability at voltages above a nominated threshold and reduction of reactive power absorption capability at voltages below a nominated threshold; and
- temperature de-rating of reactive power capability aligned with temperature re-rating of active power capability.

S5.3a.13 – Market network service response to disturbances in the power system

Voltage disturbances

The Draft Report recommends the alignment of HVDC system voltage disturbance access standards with the minimum access standard (**MAS**) and automatic access standard of generators in S5.2.5.4. MLPL supports this recommendation.

Frequency disturbances

The Draft Report recommends two complimentary measures regarding a HVDC system's ability to withstand frequency disturbances:

i. Alignment of HVDC system frequency disturbance access standards with those of S5.2.5.3. This would have the impact of requiring HVDC systems to remain in service for the same range of frequency disturbances for which generators and IRSs must remain in service.
ii. Exempting HVDC systems that are regulated NSPs from the requirements of S5.1.3. S5.1.3 requires a NSP's power system equipment to remain in service over a wider range of frequency conditions (being within the *extreme frequency excursion tolerance limits* for an indefinite time) than S5.2.5.3. Exempting NSP HVDC systems from S5.1.3 has the impact of removing the conflicting requirements of the two clauses.

The recommended approach is similar to the current S5.3a.13 requirement for Market Network Services, being to remain in continuous uninterrupted operation for "*power system frequency* within the *frequency operating standards*". The main differences between the current S5.3a.13 requirement and S5.2.5.3 requirements are:

- S5.2.5.3 defines time limits for which equipment must remain in operation during frequency deviations, whereas no limits apply in S5.3a.13; and
- at the time of publishing the Draft Report, the *frequency operating standards* (referenced in S5.3a.13) did not impose any limits on rate of change of frequency, whereas limits are specified in S5.2.5.3.

On 6 April 2023 the Reliability Panel has updated the frequency operating standard (with effect from 9 October 2023). The updated frequency operating standard contains rate of change of frequency limits. Once the revised frequency operating standard is considered, the Draft Report's recommended changes regarding S5.3a.13 frequency response would represent a lowering of the automatic access standard.

MLPL understands that modern VSC HVDC systems are able to operate for an extended period of time at the extreme frequency excursion tolerance limits (applicable in Tasmania, in island conditions) of 47.0 Hz – 55.0 Hz[4].

MLPL therefore suggests that:

1. the automatic access standard for HVDC systems remains unchanged, that is, to remain in continuous uninterrupted operation for power system frequency within the frequency operating standards; and
2. a minimum access standard for HVDC systems be established, based on the minimum access standard in S5.2.5.3.

Fault ride-through requirements

The Draft Report recommendations for fault ride through are:

i. Require HVDC systems to have the same access standards as generating systems and IRS (that is, equivalent to the AAS and MAS in NER S5.2.5.5); and
ii. That no access standards be made with regard to DC side faults.

MLPL supports both of these recommendations.

Further to recommendation ii, MLPL recommends AEMO give consideration to whether it is necessary to exempt TNSP owned HVDC systems from the requirements of S5.1.9.

S5.3a.4 – Monitoring and control requirements

MLPL supports an access standard for monitoring and protection against instability being applied to HVDC systems. Modern HVDC systems have extremely sophisticated control systems, and MLPL understands the implementation of instability detection algorithms is readily achievable. Power oscillation damper (POD) and sub-synchronous resonance (SSR) damping functionality is a standard control system option on modern HVDC systems.

The Draft Report recommends the revision of S5.3a.4 to include monitoring and protection against instability being generally aligned with the recommended changes for generators in S5.2.5.10. MLPL has no objection to this approach should the review conclude it is the

[4] These are more arduous than the equivalent mainland limits, being 47.0 Hz to 52.0 Hz.

preferred option. However, we note some characteristics of HVDC systems which suggest an alternative approach may be simpler and equally effective.

The capital cost and technical complexity of HVDC systems means that

i. HVDC systems are likely to only be installed in small numbers in the NEM, and
ii. the power rating of HVDC systems will be of high capacity, likely several hundred MW or more. The unplanned loss of such quantities of power will can potentially have a significant impact on the power system.

Furthermore, the manufacturers' design process for an HVDC system considers the unique characteristics of the power system into which the HVDC system will be integrated. The advanced control systems present on HVDC systems also permit a greater range of options for instability remediation than are available to generators, e.g. ramping back of power transfer, change of control modes, and possibly change of control loop gains.

Considering these factors, MLPL expects that instability issues for HVDC systems will be studied in detail on a case-by-case basis. MLPL therefore recommends that the technical requirements for monitoring and protection against instability for HVDC be specified at a high level only, rather than at the level of detail proposed for generators. Critical items to be specified include:

- the HVDC system must have facilities in its control system that can detect unstable or oscillatory operation. These detection facilities must be flexible and able to be configured to detect a wide range of instability conditions;
- the HVDC system must be able to accept inputs from external sources to signal that an unstable power system condition has been detected and remedial action must be taken
- the HVDC system's control system must be flexible and permit customised solutions to be implemented in response to unstable operation.

A high level access standard also has the benefit that as HVDC system manufacturers' technology evolves (e.g. the ability of grid forming inverter to stabilise power systems; the development of algorithms to detect the plant that is causing an oscillation) then that technology is more likely to be captured by the standard.

New standard – Voltage control

Modern VSC HVDC systems offer similar functionality to that of modern generator voltage control systems, and MLPL supports the Draft Report recommendation to apply the voltage control requirements of NER S5.2.5.13 to HVDC systems.

MLPL would support the Draft Report's option to require only two control modes in the AAS: a "primary" mode being voltage control, and a secondary mode being either reactive power control or power factor control. MLPL also supports reduced assessment requirements for the secondary mode.

New standard – Active power dispatch

The Draft Report identifies that there is not currently a requirement in Schedule 5.3a for an HVDC system to respond to an active power dispatch target, and a recommendation to align the active power dispatch requirements for HVDC systems with the requirements for generating systems in NER S5.2.5.14.

Because response to an active power dispatch target is an inherent feature of HVDC systems, there is no reason to oppose such a recommendation. However, there is also no urgency to mandate such a requirement either.

MLPL would like to draw AEMO's attention to issues which suggest it would be better to specify the access standard for active power dispatch in terms of capability (i.e. the HVDC system has the ability to do it, but there may be circumstances in which it is not used) rather than a mandatory requirement.

If the HVDC system connects two synchronous networks which to not have a parallel AC connection (e.g. as Basslink connects Tasmania to Victoria) then it would be possible to not utilise an external power transfer setpoint. Instead, the power transfer setpoint could be internally generated by the HVDC system, with the aim of matching the power system frequencies of the two systems. Power transfer across the link would be determined via AGC and generator dispatch in each of the two regions, just as occurs for AC interconnectors.

Even if the HVDC system did have an AC interconnector in parallel, future developments in controls and / or grid forming converter technology may allow the HVDC system to generate an internal power transfer setpoint based on voltage angle difference between the two AC connection points. That is, the HVDC would mimic the behaviour of an AC interconnector. AEMO's dispatch processes may find such an option preferential to the conventional assumption of a precise HVDC dispatch target.

References to power quality access standards

The Draft Report recommendation with respect to various power quality related access standards is to amend the references to AS/NZS 61000.3.6 and AS/NZS 61000.3.7 (with or without dates) in S5.1.5, S5.1.6 S5.1a.5 and S5.1a.6 to the latest versions TR IEC 61000.3.6 and TR IEC 61000.3.7, without dates.

MLPL supports this recommendation.