

Our ref: 18-24224
21 November 2018
GPO Box 2008
Melbourne VIC 3001
By email: audrey.zibelman@aemo.com.au


Dear Ms Zibelman,

Request for information: expected inter-regional constraints

The Australian Energy Market Commission (the Commission or AEMC) is undertaking analysis to determine whether there is a need to exercise the last resort planning power (LRPP). The Commission has determined that it requires additional information from AEMO in its role as the national transmission planner regarding expected inter-regional constraints in order to determine whether the LRPP needs to be exercised.

The LRPP is a power conferred on the AEMC under rule 5.22 of the National Electricity Rules (Rules) to ensure that sufficient investment is occurring to transport electricity between adjacent regions of the national electricity market (NEM), which is fundamental to the NEM's efficient operation. The purpose of the LRPP is to ensure timely and efficient inter-regional transmission investment in the NEM for the long-term interests of consumers of electricity.

The AEMC must annually assess whether or not it should exercise the LRPP. Under clause 5.22(f) of the Rules, this assessment must consider AEMO's two most recent National Transmission Network Development Plans (NTNDPs) and transmission network service providers' (TNSPs) transmission annual planning reports to ascertain whether TNSPs are taking appropriate steps to address the expected constraints on national transmission flow paths (inter-regional constraints) identified by AEMO. If the AEMC identifies that current processes or projects are not underway to address an expected inter-regional constraint, then the AEMC has the power to direct one or more network service providers (typically a TNSP) to apply the regulatory investment test for transmission (RIT-T) to augmentation projects that are likely to relieve that constraint. The AEMC will only exercise this power if it considers that doing so will meet the national electricity objective given the estimated economic impacts of the relevant constraint.

As you are aware, in the usual course, AEMO publishes its NTNDP in late December and provides detailed information on expected constraints. TNSPs can then respond to the NTNDP in their annual planning reports published the following June. However, in late 2017, AEMO modified arrangements for the publication of the 2017 NTNDP so that instead of publishing an NTNDP by 31 December 2017 AEMO published an Integrated System Plan (ISP) in July 2018. The ISP is a high-level system plan and contains less detailed information on expected inter-regional transmission network constraints than previous NTNDPs. The Commission has identified, and AEMO staff have confirmed, that the ISP does not specify the features of each expected inter-regional constraint. For example, the equipment/transmission lines affected, the location of the constraint on the transmission network, and the circumstances under which and the physical reasons the constraint may bind (for instance thermal limits being reached). Historically this level of detail has been published in NTNDPs.

These developments have impacted on the AEMC's ability to identify, based on the key transmission planning documents, which specific inter-regional constraints need to be addressed by TNSPs in the coming years and the projects that TNSPs plan to pursue to address them.

Consistent with the Rules, the AEMC has used the 2016 NTNDP, the 2018 ISP and the 2018 transmission annual planning reports to assess transmission inter-regional constraints in the NEM and the projects that could address these constraints. The AEMC has sought clarification from AEMO staff (in AEMO's role as national transmission planner) on the detailed information that was traditionally provided in NTNDPs on inter-regional constraints. AEMC and AEMO staff have worked collaboratively to address these data issues at officer level.

Consistent with the provisions in the Last Resort Planning Power Guidelines the Commission is now requesting from AEMO formal confirmation of the inter-regional transmission constraints that AEMO views as needing to be addressed by the relevant TNSPs. Table 1 (attached) lists the expected inter-regional constraints as understood by AEMC staff, based on information that AEMO staff recently provided to AEMC staff in email correspondence and information in the 2016 NTNDP. The AEMC requests that AEMO review Table 1 and provide an amended version as part of its response to this information request.

The Commission requests that this information be provided by Friday 7 December 2018.

If your staff require any further information please contact Richard Owens, Executive General Manager, on (02) 8296 7810 or at Richard.Owens@aemc.gov.au.

Yours sincerely,



John Pierce AO
Chairman

Table 1: Expected inter-regional constraints needing to be addressed by the relevant TNSP – for confirmation by AEMO

Based on analysis conducted by AEMC (sources referenced) and information provided by AEMO staff to the AEMC in email correspondence.

Affected interconnector and responsible TNSP(s)	Identified problem regarding inter-regional constraints as listed in:			Supplementary information provided by AEMO staff in correspondence with AEMC
	2016 NTNDP (limitations)	2018 ISP (drivers for augmentation)		
QNI TransGrid and Powerlink	Not listed			Flows towards Queensland are limited by a voltage collapse limit on loss of the largest generating unit in Queensland ²
QNI TransGrid and Powerlink	Transmission limitations between 330 kV lines between Dumaresq and Bulli Creek (part of the NSW-QLD interconnection). Transient stability limits set the exporting limit from QLD to NSW ³	Increase transfer between Queensland and New South Wales ¹		Queensland to New South Wales import is limited by the transient stability limits for fault on either a Bulli Creek-Dumaresq or Armidale-Dumaresq 330 kV circuit ⁴
QNI TransGrid	Transmission limitations between 330 kV lines between Dumaresq and Liddell ⁵			Flows towards Queensland are limited by the thermal capacity of Liddell-Muswellbrook-Tamworth and Liddell-Tamworth 330 kV lines ⁶
VNI AEMO	No relevant limitation identified. A network augmentation option for VNI was identified: a braking resistor at Loy Yang ⁷			Flows towards New South Wales are limited by the transient stability limit for a 2 phase to ground fault on a South Morang - Hazelwood 500 kV line ⁹
VNI AEMO	Transmission limitation on South Morang 500/330kV transformer ¹⁰			Flows towards New South Wales are limited by the thermal capacity of the South Morang 500/330 kV transformer ¹¹
VNI AEMO	Transmission limitations on Dederang - South Morang 330 kV circuits ¹²			Flows towards New South Wales are limited by the thermal capacity of the Dederang - South Morang 330 kV circuits ¹³
VNI TransGrid	Transmission limitations on 330 kV cutset between Yass/Canberra and Sydney ¹⁴	Increased export from VIC to NSW ⁸		Flows towards New South Wales are limited by the thermal capacity of the Upper Tumut-Canberra 330 kV line ¹⁵
VNI TransGrid		NSW coal-fired generation retirements and increased generation in SNSW, Murray and Riverland REZs and increased		Victoria to New South Wales export is limited by transmission limitations on the Sydney to Canberra/Yass 330 kV corridor during times with increased generation in southern New South Wales

Note: In regards to the ISP AEMO staff confirmed that the limitations listed in the 2018 ISP database, Transmission Annual Planning Reports summary, are sourced from the TNSP TAPRs and not recent analysis conducted by AEMO.

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		import from VIC ¹⁶	and high export from Victoria to New South Wales ¹⁷
VNI AEMO	Transmission limitations on Eildon-Thomastown 220 kV line ¹⁸	Increased import from NSW to VIC at times of high demand periods coinciding with high ambient temperature ¹⁹	New South Wales to Victoria import is limited by thermal capacity of the Eildon-Thomastown 220 kV line ²⁰
VNI AEMO	Not listed. Not identified as a material limitation in the scenarios modelled ²¹		New South Wales to Victoria import is limited by thermal capacity of the Murray-Dederang 330 kV line ²²
VNI AEMO	Transmission limitations on Dederang – Mt. Beauty 220 kV lines ²³	Not listed ²⁴	Not listed
Heywood ElectraNet	Transmission limitations on the Tungkillo-Tailem Bend-South East transmission corridor ²⁵	Not listed	Not listed
Heywood ElectraNet	Not listed	Not listed	VIC to SA transfer in both directions is limited by the existing Heywood and Murraylink interconnectors ²⁶
Murraylink ElectraNet	Transmission limitations on the 132 kV network in the Riverland region ²⁷	Not listed	Not listed
Murraylink ElectraNet	Not listed	Not listed	VIC to SA transfer in both directions is limited by the existing Heywood and Murraylink interconnectors ²⁸
Basslink TasNetworks	Transmission limitations on the Palmerston-Sheffield 220 kV line ²⁹	Second VIC-TAS IC and/or Wind Generation in NWTAS ³⁰	VIC to TAS transfer in both directions is limited by the existing Basslink interconnector ³¹
Basslink TasNetworks	Transmission limitations on the George Town-Sheffield 220 kV line ³²	Not listed	Not listed
Basslink	Voltage collapse at George Town ³³	Not listed	Not listed

Note: In regards to the ISP AEMO staff confirmed that the limitations listed in the 2018 ISP database, Transmission Annual Planning Reports summary, are sourced from the TNSP TAPRs and not recent analysis conducted by AEMO.

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TasNetworks			
Basslink TasNetworks	Transient over-voltage at George Town 220 kV ³⁴	Not listed	Not listed
Basslink TasNetworks	Basslink inverter commutation instability due to low fault level at George Town 220 kV ³⁵	Not listed	Not listed
Basslink TasNetworks	High rate of change of frequency (RoCoF) – triggered by high wind generation in Tasmania and/or increased import from Victoria to Tasmania and reduced hydro units on line ³⁶	Not listed	Not listed
Basslink TasNetworks	High rate of change of frequency (RoCoF) – Unavailability of existing FCAS services with retirement of smelters in Tasmania ³⁷	Not listed	Not listed

Note: In regards to the ISP AEMO staff confirmed that the limitations listed in the 2018 ISP database, Transmission Annual Planning Reports summary, are sourced from the TNSP TAPRs and not recent analysis conducted by AEMO.

Table 1: Expected inter-regional constraints needing to be addressed by the relevant TNSP – for confirmation by AEMO

Based on analysis conducted by AEMC (sources referenced) and information provided by AEMO staff to the AEMC in email correspondence.

- ¹ AEMO, *ISP Appendices*, July 2018, Appendix D.3.1, p68.
- ² Correspondence with AEMO on 7/10/18.
- ³ AEMO, *National Transmission Network Development Plan*, December 2016, p38.
- ⁴ Correspondence with AEMO on 7/10/18.
- ⁵ AEMO, *National Transmission Network Development Plan*, December 2016, p37.
- ⁶ Correspondence with AEMO on 7/10/18.
- ⁷ AEMO, *National Transmission Network Development Plan*, December 2016, p28.
- ⁸ AEMO, *ISP Appendices*, July 2018, Appendix D.3.5, p72.
- ⁹ Correspondence with AEMO on 7/10/18.
- ¹⁰ AEMO, *National Transmission Network Development Plan*, December 2016, p42.
- ¹¹ Correspondence with AEMO on 7/10/18.
- ¹² AEMO, *National Transmission Network Development Plan*, December 2016, p42.
- ¹³ Correspondence with AEMO on 7/10/18.
- ¹⁴ AEMO, *National Transmission Network Development Plan*, December 2016, p37.
- ¹⁵ Correspondence with AEMO on 7/10/18.
- ¹⁶ AEMO, *ISP Appendices*, July 2018, Appendix D.3.1, p70.
- ¹⁷ Correspondence with AEMO on 7/10/18.
- ¹⁸ AEMO, *National Transmission Network Development Plan*, December 2016, p42.
- ¹⁹ AEMO, *ISP Appendices*, July 2018, Appendix D.3.5, p74.
- ²⁰ Correspondence with AEMO on 7/10/18.
- ²¹ AEMO, *Victorian Annual Planning Report 2018*, July 2018, p47.
- ²² Correspondence with AEMO on 7/10/18.
- ²³ AEMO, *National Transmission Network Development Plan*, December 2016, p42.
- ²⁴ Identified as a constraint in AEMO, *Victorian Annual Planning Report 2018*, July 2018, p47.
- ²⁵ AEMO, *National Transmission Network Development Plan*, December 2016, p39.
- ²⁶ Correspondence with AEMO on 7/10/18.
- ²⁷ AEMO, *National Transmission Network Development Plan*, December 2016, p39.
- ²⁸ Correspondence with AEMO on 7/10/18.
- ²⁹ AEMO, *National Transmission Network Development Plan*, December 2016, p39.
- ³⁰ AEMO, *ISP Appendices*, July 2018, Appendix D.3.4, p72.
- ³¹ Correspondence with AEMO on 7/10/18.
- ³² AEMO, *National Transmission Network Development Plan*, December 2016, p39.

Table 1: Expected inter-regional constraints needing to be addressed by the relevant TNSP – for confirmation by AEMO

Based on analysis conducted by AEMC (sources referenced) and information provided by AEMO staff to the AEMC in email correspondence.

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- ³³ AEMO, *National Transmission Network Development Plan*, December 2016, p39.
 - ³⁴ AEMO, *National Transmission Network Development Plan*, December 2016, p40.
 - ³⁵ AEMO, *National Transmission Network Development Plan*, December 2016, p40.
 - ³⁶ AEMO, *National Transmission Network Development Plan*, December 2016, p40.
 - ³⁷ AEMO, *National Transmission Network Development Plan*, December 2016, p40.

