



Request for system strength services in Queensland to address fault level shortfall at Ross

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1. Purpose and scope

Powerlink Queensland (Powerlink) is engaging with the National Electricity Market (NEM) to ascertain and evaluate options (both non-network and network) to meet the system strength requirements identified in the Australian Energy Market Operator's (AEMO) Notice of Queensland System Strength Requirements and Ross Fault Level Shortfall published on 9 April 2020. The option or combination of options with the lowest cost identified through this consultation process and which satisfy Powerlink's regional System Strength Service Provider obligations under the National Electricity Rules (NER)¹ will be recommended for implementation.

This document has been prepared to inform potential non-network providers and interested parties with pertinent information regarding Powerlink's requirements as defined in AEMO's Notice and for the purpose of inviting expressions of interest (EOI) for potential options which will enable Powerlink to fulfil its regulatory obligations.

Powerlink is not obliged to make an offer to contract with a non-network provider as a result of this call for an EOI. Proposed options or combinations thereof are subject to confirmation by Powerlink of their technical feasibility and capability to meet the pre-requisites and criteria identified in this EOI. All costs incurred by non-network providers in relation to this EOI must be borne by them. Regardless of the outcome, non-network providers are not entitled to claim for reimbursement of time, materials or expenses occurred in connection with this EOI.

2. Engaging with our customers and stakeholders

Delivering electricity to almost four million Queenslanders, Powerlink recognises the importance of engaging with a diverse range of customers and stakeholders who have the potential to affect, or be affected by, Powerlink activities and/or investments. In particular, Powerlink works collaboratively with its Customer Panel in the normal course of business which provides a valuable avenue to keep customers and stakeholders better informed, and to receive feedback about topics of relevance. While maintaining EOI confidentiality, Powerlink will provide updates to and request input from the Customer Panel throughout the EOI process and include the most recent information on this EOI in Powerlink's 2020 Transmission Annual Planning Report.

3. Description of the requirement for system strength services

On 9 April 2020 AEMO declared an immediate fault level shortfall of 90 megavolt-amperes (MVA) at the Ross 275kV fault level node located in the Ross zone² of Powerlink's transmission network in north Queensland. AEMO also anticipates that, if not addressed, this fault level shortfall will continue beyond 2024-25.

System strength is a measure of the ability of a power system to remain stable under normal conditions and to return to a steady state condition following a system disturbance. System strength can be considered low in areas with low levels of local synchronous generation and deteriorates further with high penetration of inverter-based resources.

Under the National Electricity Rules (NER), system strength is measured by fault level at designated fault level nodes.

The System Strength Requirements Methodology published by AEMO on 1 July 2018 determined the system strength requirements for five nodes in Queensland. AEMO has now determined a new fault level requirement of 1,300MVA at the Ross 275kV node.

AEMO has performed the analysis using the process outlined in the System Strength Requirements Methodology. The outcomes of this analysis indicated that there is a fault level shortfall of 90MVA at Ross 275kV fault level node. Accordingly, on 9 April 2020, AEMO published a Notice of Queensland System Strength Requirements and Ross Fault Level shortfall declaring an immediate fault level shortfall.

Table 1 shows the projected fault level requirements, and the shortfall at the Ross 275kV fault level node.

¹ NER Clause 5.20C.3.

² Refer to Powerlink's 2019 Transmission Annual Planning Report Appendix C Zone and grid section definitions.

Table 1 Projected fault level requirements and shortfall at Ross 275kV

Year	Minimum three phase fault level (MVA)	Shortfall (MVA)
2020-21	1,300	90
2021-22	1,300	90
2022-23	1,300	90
2023-24	1,300	90
2024-25	1,300	90

As the Transmission Network Service Provider for Queensland and Jurisdictional Planning Body, Powerlink is responsible for providing system strength service and for procuring services to address this declared shortfall.

4. Option pre-requisites

Potential non-network options submitted or identified through this EOI process must meet all of the following pre-requisites in order to be assessed:

- address the requirements set out in AEMO's Notice
- be commercially and technically feasible and
- be implemented in sufficient time to enable Powerlink to meet its regional System Strength Service Provider obligations in north Queensland in accordance with the NER.

5. Technical characteristics of non-network options

Fault current is only one attribute of system strength, and is used as a measure for the level of inertia, synchronising torque, and other synchronous characteristics which a power system needs. Any new services proposed to provide system strength must be validated through detailed Electromagnetic Transient (EMT) studies.

The exact requirements are dependent on the nature of the non-network solution offered and the ability of the network support to respond to and operate in accordance with system strength requirements in north Queensland. Powerlink has identified the following common criteria that should be satisfied in the first instance:

- Generators, as well as Queensland to New South Wales interconnectors, remain online.
- All online generators return to steady-state conditions following fault clearance.
- The power system frequency is restored to normal operating frequency band (49.85Hz – 50.15Hz).
- Post fault voltage oscillations are adequately damped.

Location and size

- Proposed solutions must be large enough, individually or collectively, to meet the requirement for system strength services. However, the level of support is dependent on the location and type of network support offered.
- Notwithstanding the location of any solution, each proposal would require assessment in relation to technical constraints or other issues pertinent to the network connection in order to meet system strength requirements.

Operation and availability

- A non-network option would need to be capable of operating 24 hours per day over a period of years.
- If a generation service is proposed (either standalone or in conjunction with other services), the system strength services will be required to operate “on demand” at certain times to satisfy Powerlink's System Strength Service Provider requirements. Such operation will be required regardless of the pool price at the time³.
- Proponents of generation services are advised that network support payments are intended for output that can be demonstrated to be additional to the plant's normal operation in the National Electricity Market.
- Where there are network costs associated with a proposed non-network option, these costs will form part of the option's economic assessment.

³ The National Electricity Rules prevent a generator that is providing network support from setting the market price.

Reliability

- Proposed services must be capable of reliably meeting system strength requirements under a range of conditions and, a generator must meet all relevant National Electricity Rules requirements related to grid connection.
- Powerlink has obligations under the National Electricity Rules, its Transmission Authority and connection agreements to ensure supply reliability and system strength is maintained to its customers. Proponents of non-network options must also be willing to accept any liability that may arise from its contribution to a failure to provide system strength services, including a consequential reliability of supply failure.

Timeframe and certainty

- The AEMO Notice identifies that the fault level shortfall currently exists and Powerlink has regulatory obligations to make system strength services available to address this identified shortfall. Proposed system strength services should be able to be implemented in sufficient time to meet the identified shortfall requirements at the lowest overall cost to electricity consumers, using proven technology and, where not already in operation, provision of information in relation to development status such as financial funding and development timeline to support delivery within the required timeframe must be provided.

Duration

- The agreement duration for any proposed service will provide sufficient flexibility to ensure that Powerlink is pursuing the lowest cost investment to address the system strength requirements in north Queensland.

Powerlink welcomes submissions from non-network solution providers who consider that they could offer a non-network option that meets the pre-requisite requirements listed in Section 4.

6. Potential options identified

Powerlink is undertaking a two-part process to seek feasible non-network options to address the system strength requirements in north Queensland. Offers may be made for Part A or Part B or both Parts A and B.

- Part A – Short term system strength support through a non-network solution
Powerlink is seeking proposals to provide system strength support in north Queensland from early July 2020 for a period up to approximately two years. It must be available immediately and meet the technical requirements discussed in Section 5. Within this Part A Powerlink is seeking proposals that either:
 - fully address the fault level short-fall, or
 - partially address the fault level short-fall.
- Part B – Longer term system strength support
Powerlink is seeking proposals for longer term non-network solutions for provision of system strength support beyond approximately two years. This option should be capable of commencing immediately after the completion of Part A and meet the technical requirements discussed in Section 5.

Note that Powerlink is concurrently exploring a network option (installation of a synchronous condenser) against which non-network options proposed under Part B will be compared.

Based on submissions received to this EOI, the subsequent economic analysis will identify the optimal timing for Part A and Part B and requirements of a non-network solution and/or combination of options (i.e. non-network and network) which deliver the lowest overall cost to customers.

7. Network support service legal and commercial requirements

Powerlink's standard Network Support Contracting Principles can be found in Appendix A.

8. Expressions of interest

Powerlink welcomes EOIs from potential providers of non-network solutions to address AEMO's system strength shortfall notice.

Submissions should be presented in a written form and should clearly identify the author of the submission, including contact details for subsequent follow-up if required. If parties prefer, they may request to meet with Powerlink ahead of providing a written response.

The EOI period will close on 13 May 2020. It is anticipated the proposed solution will be published on Powerlink's website by the end of June 2020.

8.1 Submissions from non-network providers

This is not a tender process – submissions are requested so that Powerlink can fulfil its regulatory obligations to analyse non-network options. In the event that a non-network option appears to be a viable alternative, Powerlink will engage with non-network providers to clarify commercial terms.

Submissions from potential non-network providers should contain the following information:

- details of the party making the submission (or proposing the service)
- technical details (connection point etc.) to allow an assessment of a non-network option to be undertaken
- sufficient information to allow the costs of options (non-network and network) to be prudently and efficiently assessed as part of the economic assessment to ensure the best outcome for customers
- an assessment of the ability of the proposed non-network option to meet the technical requirements of the Rules
- timing of the availability of the proposed non-network option
- other material that would be relevant in the assessment of the proposed service.

As the submissions may be made public, any commercially sensitive material, or material that the party making the submission does not want to be made public, should be clearly identified. It should be noted that Powerlink intends to publish the outcomes of the process.

Please note: Emailed submissions are subject to a 10MB file size (including email text). Please contact networkassessments@powerlink.com.au to arrange a file transfer if submissions exceed this limit.

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8.2 EOI Assessment and decision process

Powerlink intends to carry out the following process to evaluate technically feasible options (both non-network and network) to meet the system strength service requirements identified in AEMO's Notice of Queensland Fault Level Shortfall at Ross.

Step 1	Publish EOI	9 April 2020
Step 2	Submissions due	13 May 2020
Step 3	Publication of the decision	30 June 2020

Powerlink reserves the right to amend the timetable at any time.

8.3 EOI process:

Powerlink will

- inform Powerlink's Customer Panel of the need for Powerlink to carry out its obligations as the System Strength Service Provider for Queensland in accordance with Clause 5.20C.3(a) of the NER
- publish this request for system strength services in north Queensland on its website
- issue a Notice via AEMO Communications to advise the NEM of the EOI and also advise all members of Powerlink's Non-Network Engagement Stakeholder Register that an EOI has been issued
- undertake direct engagement with possible non-network solution providers and any interested parties
- publish a summary* on its website noting the outcomes of the analysis and recommended solution for implementation

* The information provided on Powerlink's website in relation to the outcome of the EOI is not intended to contain confidential data.

Appendix A - Network support contracting framework

Whilst the ultimate structure and content of any non-network support agreement will depend on the particular circumstances of the non-network support that is proposed to be provided, the following is an outline of the key contracting principles that are likely to appear in any non-network support agreement:

1. **Conditions precedent** - a non-network support agreement may contain conditions precedent that need to be satisfied by either or both parties prior to the substantive obligations in the agreement having force and effect (e.g. obtaining necessary approvals, obtaining funding, testing to confirm non-network support services meet certain requirements etc.).
2. **Term:**
 - Start Date and End Date
 - Ability of Powerlink to extend the Term for a specified period/s and how the charges payable during the extended period will be calculated.
3. **Non-Network Support Services** – describes the services to be provided and the times and manner in which they will be provided, including:
 - General obligations
 - AEMO directions
 - Provision of metering points;
 - Operating standards for generation solutions.
4. **Operation and Maintenance** – inclusion of these clauses will depend on the nature of the non-network support that is to be provided but may include clauses in relation to operation, maintenance, generator capacity, modifications, right to inspect etc.
5. **Warranties** - and consequences of breaching warranties. Inclusion of these clauses will depend on the nature of the non-network support that is to be provided.
6. **Charges and Invoicing** – describes the charges payable by Powerlink to the Service Provider, including how those charges are to be calculated, when those charges are to be invoiced and GST. May also address NEM Revenue and avoided TUoS charges.
7. **Payment:**
 - Paying invoices
 - Disputed Items
8. **Liability:**

Whilst the extent of the liability of the Service Provider to Powerlink will depend on the type of non-network support that is proposed to be provided and other relevant factors, generally the types of liability provisions Powerlink would seek to include in a Non-Network Support Agreement are as follows:

 - **Extent of liability** – will set out the extent of the Service Provider's liability to Powerlink, including any exclusions and/or limitations;
 - **'Consequential loss' excluded** – generally except for liabilities provided for in the above clause, neither party will be liable for the other's loss of profits, loss of revenue, loss of anticipated profit, loss of commercial opportunity, loss of business, cost of finance or increases in operating costs;
 - **Unlimited liability** – for claims relating to personal injury or death; unlawful or illegal acts by the Service Provider, wilful default by the Service Provider and infringement of IP rights or confidentiality obligations;
9. **Insurance** - The insurances the Service Provider is required to have in place will depend on the type of non-network support that is proposed to be provided and other relevant factors.

10. **Default and Termination** – these clauses will depend on the nature of the non-network support that is to be provided but will generally address:
 - **Breach** – sets out the process for dealing with breaches, including the notice requirements and rectification period and what is to occur if there is a failure to cure a breach (including a right of termination);
 - **Termination for non-performance** – depending on the type of non-network support that is to be provided, the agreement will detail what is to occur where there is non-performance and ongoing non-performance, such as no entitlement to charges, reduction in charges, termination etc.;
 - **Termination for insolvency** – allows a party to terminate by written notice where there is an insolvency event in respect of the other party;
 - **Survival** – outlines which clauses in the agreement will survive despite termination of the agreement. (e.g. confidentiality)
11. **Dispute Resolution provisions**
12. **Confidentiality**, including the instances where disclosure of confidential information is permitted.
13. **Media** – sets out a process whereby approval is sought and obtained before a party discloses any information through any communications media concerning the non-network solution or responds to any enquiry from any media.
14. **Change in Law** – sets of procedure for dealing with changes in law affecting the agreement.
15. **General boiler plate provisions**, such as:
 - Entire agreement
 - No representations or warranties
 - Amending agreement
 - Severability
 - No Assignment
 - No Merger
 - Notices
 - Legal costs and stamp duty
 - Counterparts
 - Governing law
16. **Defined Terms and Interpretation provisions**



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