

Determination on Application for exemption from certain requirements of the Technical Rules submitted by Western Power

Byford PV solar farm (3 x 9.9 MW) connections

December 2014

Economic Regulation Authority

WESTERN AUSTRALIA

© Economic Regulation Authority 2014

This document is available from the Economic Regulation Authority's website at www.erawa.com.au. For further information, contact:

Economic Regulation Authority
Perth, Western Australia
Phone: (08) 6557 7900

Contents

DECISION	1
REASONS	3
Access Code Requirements	3
Western Power's Application for Exemption	3
Western Power's Assessment	3
Public Submissions	4
Authority's Considerations	5

DECISION

1. Western Power submitted an application to the Economic Regulation Authority (**Authority**) for exemption from compliance with certain requirements of its Technical Rules in relation to the connection of WestGen Pty Ltd's (**WestGen**) three 9.9 MW Byford photovoltaic (**PV**) solar farms (**Byford PV solar farm**). The application is made under section 12.40 of the *Electricity Networks Access Code 2004* (**Access Code**).
2. Technical Rules consist of the standards, procedures and planning criteria governing the construction and operation of an electricity network and are required under the Access Code for all covered networks. The Authority first approved and published Western Power's Technical Rules on 26 April 2007 and they became effective from 1 July 2007. Revisions to the Technical Rules were approved by the Authority on 10 November 2011 and took effect from 23 December 2011.
3. Under section 12.40 of the Access Code, a service provider may apply to the Authority for an exemption from one or more requirements of its technical rules which apply to the service provider and all applicants, users and controllers of the covered network.
4. Section 12.41 of the Access Code requires the Authority to determine an application as soon as practicable as a reasonable and prudent person on reasonable technical and operational grounds and having regard to the effect the proposed exemption will have on the service provider and users of the network and any interconnected network. The Authority must grant the exemption if it determines that in all the circumstances, the disadvantages of requiring compliance with the Technical Rules are likely to exceed the advantages.
5. Under section 12.46 of the Access Code, the Authority may consult the public in accordance with Appendix 7. The Authority issued an invitation for submissions on 18 November 2014, with a closing date for submissions of 3 December 2014. As part of this consultation, the Authority prepared an issues paper to assist interested parties. Two submissions were received and have been published on the Authority's website.¹
6. As a result of the submissions received and questions raised by the Authority's technical adviser regarding the application, Western Power re-submitted its Technical Rules exemption application on 18 December 2014.
7. After consideration of Western Power's re-submitted application for exemption from the Technical Rules, independent advice from the Authority's technical adviser and public submissions, the Authority has determined that the disadvantages of requiring compliance with the Technical Rules are likely to exceed the advantages. The Authority, therefore, approves Western Power's application for an exemption.
8. The following exemption is granted:
 - Western Power is exempted from complying with the requirements of Clause 2.5.2.2 of the Technical Rules with respect to the connection of the Byford PV solar farm (3 x 9.9 MW Declared Sent Out Capacity (**DSOC**) for

¹ <http://www.erawa.com.au/electricity/electricity-access/western-power-network/technical-rules/exemptions-from-technical-rules/byford-pv-solar-farms>

a total of 29.7 MW DSOC). The exemption will enable Western Power to provide a constrained connection. The generation output will be runback (reduced) as required to prevent a pre-contingent overloading as well as a contingent (N-1) overloading in the network.

- The exemption will apply until the Southern Country Competing Access Group (CAG 81) is operational, or until it is otherwise revoked in accordance with the provisions of the Electricity Networks Access Code 2004.²

9. The reasons for the Authority's decision are set out below.

² Access Code cl 12.43(c) provides for exemptions under section 12.41 to be varied or revoked by the service provider after reasonable notice to the user.

REASONS

Access Code Requirements

10. Section 12.41 of the Access Code requires the Authority to determine an application as soon as practicable as a reasonable and prudent person on reasonable technical and operational grounds and having regard to the effect the proposed exemption will have on the service provider and users of the network and any interconnected network. The Authority must grant the exemption if it determines that, in all the circumstances, the disadvantages of requiring compliance with the Technical Rules are likely to exceed the advantages.
11. Under section 12.43 of the Access Code, an exemption:
 - may be granted for a specified period or indefinitely;
 - may be subject to any reasonable conditions the service provider considers fit, in which case the network persons must comply with the conditions, or may be unconditional; and
 - may be varied or revoked by the service provider after reasonable notice to the network persons.

Western Power's Application for Exemption

12. Western Power submitted an application for an exemption from compliance with the Technical Rules to the Authority on 21 October 2014. Western Power submitted an amended application on 18 December 2014.
13. The application is for an exemption from compliance with clause 2.5.2.2 of the Technical Rules (i.e. a requirement to base reliability on the N-1 criterion) to allow Western Power to provide a constrained connection for the Byford PV solar farm (3 x 9.9 MW DSOC for a total of 29.7 DSOC).
14. WestGen, the owner of the Byford PV solar farm, is a member of the Competing Applications Group (**CAG**) No. 81: South Country Generation (**CAG 81**)³. Western Power advises it is currently progressing a Network Constraint Tool (**NCT**)⁴ solution for CAG 81. WestGen, the owner of Byford PV solar farm, is seeking to connect to the Western Power network prior to the NCT solution becoming available to connect all members of CAG 81.

Western Power's Assessment

15. Western Power in consultation with WestGen has proposed a non-reference service under which WestGen has agreed that its ability to export electricity will be

³ Under Western Power's Applications and Queuing Policy (AQP), access seekers affected by a common network constraint are grouped together in a CAG. Western Power then seeks to develop a solution to enable all CAG members' access to the network.

⁴ The NCT is a supervisory tool designed to automatically runback generation prior to a potential fault (known as pre-contingent) to ensure that the network remains in a satisfactory state should that fault occur.

- constrained via a post-contingent runback scheme under certain network conditions. This will enable the Byford PV solar farm to connect and operate without the need for significant network augmentation, and prevent contingent (N-1) overloading in the network.
16. Western Power has stated that there will be no impact on other network users, including the other members of CAG 81.
 17. Western Power does not expect similar requests from other CAG 81 users as current connection timelines for other members of the group extend beyond the expected development of an NCT solution. If a member of CAG 81 seeks a similar interim arrangement, Western Power would assess the suitability on a case by case basis.
 18. Western Power has conducted studies and identified the following network constraints which need to be addressed to enable the connection of the Byford PV solar farm:
 - Single phase fault levels at Kwinana and Southern Terminal 132 kV bus sections exceed 95 per cent equipment rating limit stipulated in the Technical Rules.
 - N-1 contingencies result in thermal overloading of several 132 kV circuits in the Mandurah Load Area.
 19. Mindful of these constraints, Western Power studies have recommended progressing with the connection of the solar farm to 22 kV shared feeders with a post-contingent runback scheme monitoring the following 132 kV transmission lines:
 - Pinjarra – Aloca Pinjarra (PNJ – APJ 81) Transmission Line;
 - Pinjarra – Cannington/Meadow Springs (PNJ – CT/MSS 81) Transmission Line; and
 - Pinjarra – Mandurah (PNJ – MH 81) Transmission Line.
 20. Under the proposed runback scheme, the generation output will be runback (reduced) as required to prevent pre-contingent as well as a contingent (N-1) overloading in the network.
 21. Western Power has stated that it considers the advantages of operating with the exemption sought outweigh the disadvantages of requiring full compliance in this case.
 22. In its application, Western Power provided a copy of the letter from WestGen indicating support for Western Power's application as it believes it is the only alternative that provides an appropriate balance between connection reliability and cost to the solar farm projects.
 23. As this interim solution has been requested by WestGen, the solution will be funded by a customer contribution.

Public Submissions

24. Under section 12.46 of the Access Code, the Authority may consult the public in accordance with Appendix 7. The Authority issued an invitation for submissions on 18 November 2014, with a closing date for submissions of 3 December 2014. Submissions were received from the Independent Market Operator (**IMO**) and Community Electricity. The two submissions have been published on the Authority's

- website. Neither submission objected to Western Power's exemption application but did raise concerns in relation to Western Power's plans to introduce an NCT.
25. In its submission, the IMO notes that Western Power's application did not provide any justification or reason for the alternative exemption end date of 1 December 2018.⁵ The IMO also states that it has significant concerns about the implementation of a partially constrained network/market model via the proposed NCT.
 26. The IMO states that both it and Western Power have considered a number of possible options for such a model but investigations have identified that a partially constrained network/market model would:
 - be unlikely to deliver least-cost generation for the South West Interconnected System (**SWIS**) by preventing the dispatch of lower price generation;
 - be likely to compromise the integrity of the Balancing Merit Order;
 - reduce market transparency and undermine the accuracy of forecast pricing; and
 - be unlikely to satisfy the Electricity Market Objectives in order to enact the changes to the Market Rules and Market Procedures required to support the NCT.
 27. The IMO states it does not consider the NCT can be implemented successfully at this point under the current regulatory and market framework, and thus does not consider the proposed NCT as feasible. The IMO states that it and Western Power have not identified a suitable alternative partially constrained solution.
 28. The IMO notes there is an urgent need for policy guidance in relation to a constrained network access model and is considering working jointly with Western Power to write a proposal to Government to request a policy decision on the adoption of a constrained network access model. The IMO notes it would welcome the support of the Authority in doing so.
 29. Community Electricity qualified its support for the application in that it supports the application conditional on the IMO being satisfied that the NCT is fit for purpose and properly integrated with the Wholesale Electricity Market Balancing Market. Community Electricity noted that the NCT is not properly developed and conflicts with the Wholesale Market Objectives. Community Electricity notes that if the NCT remains dysfunctional then other network users who are participants in the Balancing Merit Order could be adversely affected by the proposal.

Authority's Considerations

30. In considering whether to approve Western Power's application for exemption from certain aspects of the Technical Rules, the Authority must, having regard to the effect the proposed exemption will have on the service provider and users of the network and any interconnected network, grant the exemption if it determines that in all the circumstances, the disadvantages of requiring compliance with the Technical Rules are likely to exceed the advantages.

⁵ The Authority notes that Western Power's original application as submitted on 21 October 2014 had an alternative exemption end date of 1 November 2018, and not 1 December 2018 as stated by the IMO.

31. The Authority appointed a technical adviser, Geoff Brown and Associates (**GBA**), to provide advice in relation to Western Power's application. A copy of GBA's advice has been published with this decision.⁶
32. The Authority's technical adviser carried out a high level review of Western Power's application and notes that:
- Given the planning requirements of Western Power's Technical Rules (which are based on the requirement to maintain an unconstrained network), a network augmentation would be necessary before the Byford solar farm could connect. In such circumstances Western Power would normally require a capital contribution towards the cost of the augmentation from the owner of the asset wishing to connect (in this case WestGen).⁷*
- In order to connect to the existing network without having to pay a capital contribution, WestGen is proposing to fit a runback scheme so that the power output of Byford could be reduced whenever an operating situation arises where there is a potential for a line overload to occur.⁸*
- In accordance with Section 12.40 of the Access Code (Code), Western Power has applied to the Authority for an exemption from clause 2.5.2.2 of its Technical Rules (Rules) so that the Byford solar power farm can connect to the network without the need for a network augmentation.⁹*
33. With respect to the runback scheme and power output reduction, the Authority's technical adviser notes that:
- This reduction in sent out power would not disrupt supply to consumers as the lost Byford generation would be offset by increasing the sent out power output of generators connected elsewhere on the network. In the event that the Byford sent out power was run back to zero, the operating state of the network would revert back to the state that existed prior to the connection.¹⁰*
- WestGen has agreed to a constrained connection and the operation of a runback scheme as a requirement for connection to the SWIN. A letter from WestGen to this effect was included as Attachment 1 to Western Power's application.¹¹*
34. The Authority's technical adviser considers that:
- While we have not seen any economic analysis, it is most likely that the discounted cost of the runback scheme over the life of the solar farm is substantially less than the capital cost of any network augmentation, to the extent that it could be uneconomic for the Byford generation to connect without an exemption being granted.¹²*
35. The Authority's technical adviser notes that:
- We see no reason for the exemption to include an arbitrary termination date. We note that a termination date of 1 November 2018 would fall well within the life of the photovoltaic generators. This date appears arbitrary and appears to present an unjustified commercial risk to WestGen.¹³*

⁶ Review of Western Power's Application for a Technical Rules Exemption for Byford Photovoltaic Solar Farm, Geoff Brown & Associates, December 2014.

⁷ Review of Western Power's Application for a Technical Rules Exemption for Byford Photovoltaic Solar Farm, Geoff Brown & Associates, December 2014, p. 1.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid, p. 2.

¹¹ Ibid, p. 3.

¹² Ibid.

¹³ Ibid.

36. The Authority's technical adviser concludes that:

...the advantages of granting the exemption from clause 2.5.2.2 of the Rules outweigh the disadvantages. We therefore recommend that Western Power's application to exempt the connection of the Byford photovoltaic solar farm from this clause of the Rules be granted by the Authority.

We see no justification for a prescribed termination date of 1 November 2018 and consider that the exemption should remain in place until the regulatory and market framework governing generator access is changed to the extent that it is no longer needed.¹⁴

37. The Authority notes that if the exemption is approved, Western Power will be able to connect the Byford PV solar farm to the network without having to augment the transmission system. Transmission system augmentations can be expensive and the requirement to pay a capital contribution toward the cost of increasing the capacity of the transmission system to ensure full compliance with the Technical Rules can be a barrier to entry for new generators to enter the market.
38. As outlined above, WestGen has confirmed in writing that it is happy to accept the proposed constrained connection. Western Power has stated that granting the exemption will not impact on other users of the network. It also states that other members of CAG-81 will not be impacted as the current timelines for other members extend beyond the development of the NCT solution and therefore Western Power expects similar requests to be unlikely.
39. As noted in GBA's report, in the event that the Byford sent out power is run back to zero, the operating state of the network will revert back to the state that existed prior to the connection. There will be no disruption of supply to consumers as the lost Byford generation will be offset by increasing the sent out power output of generators connected elsewhere on the network. Based on the information provided by Western Power and the advice of GBA, the Authority considers it reasonable to assume that granting the exemption will not adversely impact on other users of the network.
40. In relation to whether the proposed constrained connection will adversely impact other members of CAG-81, the Authority notes that Western Power's approved Applications and Queuing Policy includes provision for any competing member of the CAG to object to an applicant specific solution if it considers that implementing the solution will impede the ability of Western Power to provide the service requested by the competing applicant compared with what the position would be if the applicant-specific solution were not implemented. The Authority considers this provision should serve to ensure that other members of the CAG are not adversely impacted.
41. In relation to the period for which the exemption applies, Western Power's initial application requested the exemption be granted on a temporary basis until either the establishment of the network constraint tool (NCT) for the Competing Applications Group (CAG) No. 81 South country generation or 1 November 2018, whichever comes first. Taking account of concerns raised in submissions and the technical review, Western Power subsequently amended its application to request the exemption to apply until "the Southern Country Competing Access Group (CAG-81) is operational, or until it is otherwise revoked in accordance with the provisions of the Electricity Networks Access Code 2004". The Authority notes that Section 12.43(c) of the Access Code permits exemptions granted under section 12.41 to be varied or revoked by the service provider after reasonable notice to the user.

¹⁴ Review of Western Power's Application for a Technical Rules Exemption for Byford Photovoltaic Solar Farm, Geoff Brown & Associates, December 2014, p. 4.

42. The Authority considers that removing reference to the proposed NCT solution whilst retaining the temporary nature of the exemption adequately deals with the concerns raised in submissions and in GBA's advice.
43. Although the IMO and Community Electricity have raised concerns in their submissions, these do not relate to the exemption Western Power has requested for the proposed post contingent runback scheme. The Authority notes that the IMO has no objection to the proposed exemption proposed by Western Power. Whilst important and of concern, the Authority considers the issues raised in relation to Western Power's proposed NCT fall outside the scope of this decision. These issues are discussed further below.
44. The Authority notes Western Power's application stated that following the connection of the Byford PV solar farm to the network, the single phase fault levels at the 132kV bus sections at the Kwinana and Southern Terminal stations could potentially exceed 95 per cent of the equipment fault rating. This would result in a non-compliance with clause 2.5.7 of the Technical Rules. Western Power subsequently advised the Authority, in its amended application submitted on 18 December 2014, that it would be submitting a temporary Technical Rules exemption application for clause 2.5.7, in early 2015.
45. Taking account of the matters discussed above, the Authority considers the disadvantages of requiring compliance with the Technical Rules for connection of the Byford PV solar farm are likely to exceed the advantages. Accordingly, as required under section 12.41 of the Access Code, the Authority approves Western Power's application for exemption. However, the Authority notes that in order for Western Power to connect the Byford PV solar farm to the SWIS, a further Technical Rules exemption application for clause 2.5.7 will need to be sought or otherwise resolved.
46. In relation to the concerns raised in submissions regarding the NCT solution proposed by Western Power, the Authority agrees these are important issues which should be resolved before such a solution is adopted.
47. The Authority notes that Western Power is required to use all reasonable endeavours to accommodate applicants' requirements to obtain covered services. The Authority also notes the objective of the Access Code is to promote economically efficient investment in and operation and use of the network in order to promote competition in markets upstream and downstream of the network. If the NCT solution proposed by Western Power impacts negatively on the effectiveness of the WEM, then it is unlikely to meet the objective of the Access Code.
48. The Authority has identified the issue of constrained network access as a key matter for its 2014 report to the Minister for Energy on the effectiveness of the Wholesale Electricity Market.¹⁵ As set out in the Discussion Paper, the Authority has flagged this as an issue since 2008 and recommended that a proper review be undertaken. The Authority agrees with the IMO's view that there is an urgent need for policy guidance in relation to a constrained network access model. In the interim, development of the network needs to be undertaken in a manner that is consistent with the Access Code objectives and avoids creating further issues for the future.
49. The Authority will continue to engage with stakeholders and provide whatever assistance and advice it is able to progress this matter.

¹⁵ See <http://www.erawa.com.au/electricity/wholesale-electricity-market/annual-report-to-the-minister/2014-ministers-report> pp. 10-11.