

Application to revoke Technical Rule temporary exemption granted to Western Power for Meadow Springs Zone Substation

Consultation Paper

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Economic Regulation Authority

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Invitation to make submissions

Submissions are due by 4:00 pm WST, Thursday, 15 March 2019

The ERA invites submissions on this paper and encourages all interested parties to provide comment on the matters discussed in this paper and any other issues or concerns not already raised in this paper.

We would prefer to receive your comments via our online submission form <https://www.erawa.com.au/consultation>

You can also send comments through:

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Post: PO Box 8469, PERTH BC WA 6849
Fax: 08 6557 7999

Please note that submissions provided electronically do not need to be provided separately in hard copy.

All submissions will be made available on our website unless arrangements are made in advance between the author and the ERA. This is because it is preferable that all submissions be publicly available to facilitate an informed and transparent consultative process. Parties wishing to submit confidential information are requested to contact us at info@erawa.com.au.

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Introduction

On 20 July 2015, the Economic Regulation Authority approved Western Power's application for a temporary exemption from compliance with clause 2.5.4(b) of the Technical Rules' capacity requirements at the Meadow Springs zone substation.¹ The approval was granted under section 12.41 of the *Electricity Networks Access Code 2004*.

Clause 2.5.4(b) sets out the Normal Cyclic Rating (NCR) Criterion, which determines the maximum allowable power that can be transferred through the Meadow Springs zone substation under normal operating conditions.² The exemption allows a higher level of power to be transferred than would be the case if there were no exemption.

On 14 December 2016, the ERA received an application from Mr Stephen Davidson to revoke the exemption. Mr Davidson's application was made under section 12.45 of the Access Code.

On 19 May 2017, Mr Davidson applied to the Electricity Review Board for a review of the ERA's decision. The ERA suspended its review of Mr Davidson's application during the Electricity Review Board process.

Following completion of the Electricity Review Board review in October 2018,³ the ERA restarted its review of Mr Davidson's application, and asked Western Power to provide any new information relevant to the exemption.

The ERA is now seeking views from stakeholders on the application to revoke the Meadow Springs zone substation Technical Rules exemption.

This paper has been prepared to assist interested parties to make submissions on the application. These submissions will assist the ERA to make its determination.

Regulatory Requirements

Technical Rules contain the standards, procedures and planning criteria that govern the construction and operation of an electricity network. They are required under the Access Code for all covered networks.

Under section 12.40 of the Access Code, a service provider may apply to the ERA for an exemption from one or more requirements of its Technical Rules.

Under Section 12.41 of the Access Code, when it receives an application the ERA must determine it as soon as practicable. The Access Code requires the ERA to consider the application as a reasonable and prudent person on reasonable technical and operational grounds, and have regard to the effect the proposed exemption would have on the service providers and users of the network and any interconnected network.

The ERA must grant the exemption if it determines that the disadvantages of requiring the network persons to comply with the requirement are likely to exceed the advantages in all circumstances.

¹ The Meadow Springs zone substation transfers power from the transmission network to the distribution network in the Mandurah area.

² The NCR criterion permits the loss of a portion of power transfer capacity at a submission following the unplanned loss of a supply transformer.

³ The Electricity Review Board dismissed the application on the basis that it did not fall within the scope of the Board's jurisdiction and because Mr Davidson was not a person aggrieved.

Under section 12.43 of the Access Code, an exemption may be:

- granted for a specified period or indefinitely;
- 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
- varied or revoked by the service provider after reasonable notice to the network persons.⁴

Section 12.47 of the Access Code requires the ERA to publish a notice giving details of any exemption.

Under section 12.45 of the Access Code, a person may apply to the ERA to revoke any exemption granted under section 12.41. The ERA must consider the application and within a reasonable time and advise the person of the ERA's determination.

Application to revoke exemption

Mr Davidson applied to the ERA to revoke the temporary exemption from compliance with clause 2.5.4(b) of the Technical Rules for capacity requirements at the Meadow Springs zone substation, which was granted to Western Power in July 2015. A copy of the application is included as Appendix 1.

In his application, Mr Davidson stated that the determination to approve the exemption was inconsistent with the Access Code objectives to promote efficient investment and:

“has quite the opposite effect of allowing and fostering Western Power's economically inefficient investment in zone substations – hundreds of millions of dollars”.

Mr Davidson said that Western Power's application did not consider the correct application of clause 2.5.4(b), and this resulted in the ERA making an incorrect decision.

Mr Davidson's application also referred to the subsequent amendment to clause 2.5.4(b) proposed by Western Power in April 2016 and approved by the ERA on 9 November 2016. He notes a submission made by Mr James Davidson on 3 June 2016 in response to the ERA's public consultation that the proposed change may not actually result in improved efficiency of investment. Mr Stephen Davidson said the submission “[was] central for the argument presented here too”.

Mr Stephen Davidson requested that the ERA:

“Revoke the decision on the basis that it fosters overinvestment in the network.

Perform a techno economic analysis of the Option (of the literal application of the technical Rule 2.5.4(b) Normal Cycling Rating (NCR) Criterion of the Technical Rules 2011.

List all the implicit and explicit assumptions, data and workings for that analysis, facilitating transparency and public scrutiny.”

⁴ “network persons” means the service provider, applicants, users and controllers of a covered network where the service provider of the covered network has applied to the ERA for an exemption from one or more requirements of the technical rules applying to the covered network.

Summary of ERA decisions referred to in the application

Mr Davidson's application refers to two decisions made by the ERA. The first is the exemption from the Technical Rules for the Meadow Springs zone substation approved by the ERA on 20 July 2015.

The second is the amendment to clause 2.5.4(b) of the Technical Rules approved by the ERA on 9 November 2016.

A summary of both these decisions is set out below. Elements of the reasoning particularly relevant to the matters raised in Mr Davidson's application about the NCR criterion have been included.

Meadow Springs Technical Rule exemption

On 15 May 2015, Western Power submitted an application to the ERA for a temporary exemption from compliance with clause 2.5.4(b) of the Technical Rules (that is, NCR) for the Meadow Springs zone substation. Western Power requested the exemption to apply until the completion of Stage 2 of the Mandurah load area investment strategy, or unless otherwise revoked under the provisions of the Code.

Western Power requested the exemption to enable it to defer capital expenditure:

...Western Power's 2014 load forecasts indicate the NCR capacity of the Mandurah and the Meadow Springs zone substations in the Mandurah load area will be exceeded within the five year outlook. The Mandurah zone substation has forecast non-compliance exposure with the NCR Criterion from 2016/17 and the Meadow Springs zone substation has forecast non-compliance exposure with NCR Criterion from 2015/16.

Western Power studies, based on the Technical Rules planning criteria, have shown that in order to maintain compliance obligations at both substations, the required network investment option (Mandurah Extension Project) would involve significant substation augmentation at Mandurah. The project cost estimate is \$27 million.

Western Power has undertaken a cost benefit analysis using risk-based planning techniques. Based on this analysis, Western Power proposes deferring the Mandurah Extension Project to 2019/20 and, instead, bringing forward capacity expansion at the Meadow Springs substation to 2016/17. The Meadow Springs expansion project cost estimate is \$9.2 million.

The ERA issued an invitation for submissions and received one from Community Electricity.

Community Electricity noted its support of avoidance of over investment in the network. However, Community Electricity also noted that Western Power appeared to intend to proceed with its proposal with or without the exemption and that granting the exemption would enable it to do so with reduced "impact on its compliance, reputation and financial risk exposure". Community Electricity considered, if this was the case, it was not an appropriate use of an exemption and did not support it.

The ERA also obtained technical advice from Geoff Brown & Associates (GBA).

At the time of the application, clause 2.5.4(b) stated:

- 1) The NCR risk criterion permits the loss of a portion of power transfer capacity at a substation following the unplanned loss of a supply transformer within that substation.
- 2) The portion of the power transfer capacity that may be lost is the lesser of:
 - (A) 75% of the power transfer capacity of the smallest supply transformer within the substation; and
 - (B) 90% of the power transfer capacity of the rapid response spare supply transformer.

In its advice to the ERA, GBA noted the wording of clause 2.5.4(b) was “unfortunate” as:

“...it does not convey its intended meaning. The intent is to specify the maximum allowable power transfer through a substation under normal operating conditions, having due regard for the need to maintain spare transformer capacity to cater for contingency situations. As interpreted by Western Power, this is determined by the total installed power transformer capacity within the substation rather than the capacity of the smallest supply transformer. For the purposes of this review we have used Western Power’s interpretation of the clause, but we recommend that the wording be revised in the next revision of the Rules so that it accurately conveys its intended meaning”.

GBA also noted:

While we consider the 75% planning threshold to be reasonable, it is nevertheless deterministic in nature. When mandated as a regulatory requirement, deterministic criteria can give rise to suboptimal outcomes by limiting the options available to a service provider to manage risk in specific situations. For example, the optimum loading at which a particular substation might be loaded could be impacted by the available distribution transfer capacity and the extent to which the transformer capacity in adjacent substations is utilised. It would be reasonable for the maximum allowable power transfer to be a higher proportion of total transformer capacity if load could be readily transferred to adjacent substations following a transformer failure than if this option was not available.

GBA recommended granting the exemption application, although noted:

Insufficient information has been provided for us to undertake a full analysis, and we would like to have seen more information on the detail and timing of Western Power’s planned augmentations and also on the available risk mitigation options. However, there is sufficient information in the application for us to be satisfied that the risk in granting the exemption application is low and is likely to be overshadowed by the potential for suboptimal or inefficient investment if the exemption is not granted.

GBA also recommended:

If the NCR planning criterion is to be retained when the Technical Rules are next revised, the wording of clause 2.5.4(b) of the Rules be revised to more accurately reflect the way the criterion is applied.

After considering Western Power’s application, independent advice and the public submission received, the ERA determined the disadvantages of requiring compliance with the Technical Rules were likely to exceed the advantages. The ERA approved the exemption on 20 July 2015. In its determination, the ERA noted:

...there is considerable uncertainty in the demand forecasts for the Mandurah area. Proceeding to invest now based on the prescriptive requirements of the Technical Rules could result in significant underutilised assets in future.

Based on Western Power's application and GBA's advice, it appears the risk of interruption to customers over the next five years is small and mitigation measures can be put in place to mitigate this further. The Authority also notes Western Power has a transformer capacity augmentation plan in place to ensure that both the Mandurah and Meadow Springs substations will comply with the NCR criterion requirement of the Technical Rules by 2020. Furthermore, this investment could be brought forward in the event that projected demand increased above the current forecasts.

Taking account of the information in Western Power's application and the advice of GBA, the Authority considers Western Power's proposed investment strategy provides a balance between minimising the financial risk of premature investment in the Mandurah load area and the risk to customer supplies. It also provides flexibility for changes to be made in response to changes in forecast demand.

Accordingly, the Authority considers an exemption from clause 2.5.4(b) of the Technical Rules to enable Western Power to adopt its proposed risk based approach, rather than the deterministic requirement of the Technical Rules is appropriate.

In response to Community Electricity's concern that Western Power appeared to intend to proceed with its proposal with or without the exemption and that granting the exemption would enable it to do so with reduced "impact on its compliance, reputation and financial risk exposure", the ERA considered:

...Western Power's proposed risk based investment strategy is more efficient than what would be required using the deterministic planning criterion in the Technical Rules. To enable Western Power to use a different planning methodology from the one prescribed in the Technical Rules, an exemption is required.

The ERA noted, as identified in GBA's report, that the information included in Western Power's submission for the planned investment and mitigation of risks was limited.

The Authority considers future applications should be customer focussed with a comprehensive explanation of the drivers behind Western Power's proposed course of action and its risk assessment to enable stakeholders to better understand and assess the proposal in terms of its benefits to customers.

The ERA also noted GBA's recommendations to review the wording of clause 2.5.4 and the more general comments GBA had made about the shortcomings of prescriptive planning standards.

The Authority notes that the State Government is currently considering the transfer of network regulatory functions to the national regime. The Authority recommends these points be considered by the project group investigating the means for this transfer.

Decision to amend clause 2.5.4(b)

In April 2016 Western Power submitted an application to amend clause 2.5.4(b) of the Technical Rules. Western Power noted:

"The preparation of the recent submission for a Technical Rules exemption for Meadow Springs works led to closer scrutiny of the NCR criterion clause in the Rules. On the basis of the Meadow Springs work, and feedback from the ERA's technical consultant, a more practicable wording for this Rule is being proposed."

The ERA published an issues paper on 2 May 2016, inviting submissions. One submission was received from Mr James Davidson, who noted:

“It seems that the proposed change to Clause 2.5.4 may not actually result in improved efficiency of investment.”

Mr James Davidson’s submission included some calculations that he considered showed possible outcomes.

The ERA’s technical consultant noted:

“The intent of the proposed change is to clarify the existing requirement, rather than to change it as suggested by Mr James Davidson. That said, Mr James Davidson’s submission has been very useful because it has highlighted the fact that the wording proposed by Western Power does not accurately reflect the intent of the proposed change.”

GBA recommended some changes to the wording to clarify the requirement.

On 7 September 2016 the ERA published a draft decision to not approve the proposed amendment:

“The Authority considers good electricity industry practice, as required under Chapter 12 of the Code, is for all clauses of the Technical Rules to be clearly worded to enable users to properly understand the requirements. Accordingly, the Authority does not approve Western Power’s proposed amendments to clause 2.5.4. The Authority considers the wording recommended by GBA would provide clarity in relation to the intent of the clause.”

Western Power submitted a revised proposal. Western Power agreed with the comments from GBA and the ERA’s draft decision about clarifying the NCR criterion and adopted the wording recommended by GBA.

A public submission on the draft decision was received from Mr Stephen Davidson, who said:

“If a techno-economic comparison of the existing requirement in the TR (NCR now) and proposed (NCR proposed change in April 2016) is performed, it will show to what extent that the proposed leads to inefficient outcomes (relevant to NCR now).”

GBA reviewed Mr Stephen Davidson’s submission, noting:

“There is no change to the existing requirement. The only issue is the clarity with which the NCR requirement is prescribed in the Rules.”

The ERA approved the amended wording on 9 November 2016, noting:

“Western Power agreed with the Authority’s required (draft decision) amendment and in its revised proposal has adopted the recommended wording of GBA in full. The Authority notes the submission from Mr Steve Davidson regarding the NCR, but also notes the advice from GBA that there is no actual change to the existing requirements and that the change relates purely to a clarification of the NCR requirement in the Technical Rules.

The Authority considers that good electricity industry practice, as required under chapter 12 of the Code, is for the Technical Rules to be clearly worded to enable users to understand its requirements. Accordingly, the Authority approves Western Power’s revised proposed amendments to clause 2.5.4 of the Technical Rules.”

Assessment of Mr Stephen Davidson's application

Mr Stephen Davidson applied to the ERA to revoke the temporary exemption from compliance with clause 2.5.4(b) of the Technical Rules for capacity requirements at the Meadow Springs zone substation, which the ERA approved on 15 July 2015.

In his application, Mr Davidson said that the determination to approve the exemption was inconsistent with the Access Code objectives to promote efficient investment and:

“has quite the opposite effect of allowing and fostering Western Power's economically inefficient investment in zone substations – hundreds of millions of dollars”.

As the basis of Western Power's application for the Meadow Springs Technical Rules exemption was to allow Western Power to defer capital expenditure, it was initially unclear to the ERA how approving the exemption could result in over-investment.

Based on further communication with Mr Davidson, the ERA understands Mr Davidson's view to be that, if a literal interpretation of clause 2.5.4(b)⁵ had been applied by Western Power, no investment would have been required and the request for the exemption would not have been needed.

Mr Stephen Davidson considered the NCR capacity for the Meadow Springs zone substation, based on a literal interpretation of clause 2.5.4(b), was 62.1 MVA, rather than the 55.6 MVA assumed by Western Power in its application for the exemption.

When the Meadow Springs exemption was granted in July 2015, clause 2.5.4(b) of the Technical Rules was worded as follows:

Normal Cyclic Rating (NCR) Criterion

- (1) The NCR risk criterion permits the loss of a portion of *power transfer* capacity at a substation following the unplanned loss of a *supply transformer* within that substation.
- (2) The portion of the power transfer capacity that may be lost is the lesser of:
 - (A) 75% of the power transfer capacity of the smallest supply transformer within the substation; and
 - (B) 90% of the power transfer capacity of the rapid response spare supply transformer.

Meadow Springs had two transformers with ratings of 38.64 MVA and 35.51 MVA respectively. Assuming the largest transformer lost supply, the transformer capacity would be reduced to 35.51 MVA. A literal interpretation of clause 2.5.4(b) – which Mr Davidson considered to be the correct interpretation – meant the maximum power loss permitted was 75 per cent of 35.51 MVA (the smallest transformer). So the NCR capacity would be 62.1 MVA (calculated as 35.51 MVA + 75 per cent of 35.51 MVA).

However, Western Power had calculated the NCR capacity limit as being 75 per cent of the total power transfer capacity of the substation with all supply transformers in place. That is, 75 per cent of (38.64 MVA + 35.51 MVA) = 55.6 MVA.

⁵ As it was defined at the time of the exemption application.

Taking account of the information provided by Mr Davidson, the ERA asked Western Power to clarify the capacity limits used in its May 2015 application and its ongoing requirement for the exemption should these limits change.

In its response provided in May 2017, Western Power acknowledged the capacity limits referred to in its exemption submission were based on a more conservative approach than required by clause 2.5.4(b) at the time of the application, and provided a corrected version of its application.⁶

In its amended application, Western Power corrected the NCR capacity limit for Meadow Springs from 55.6 MVA to 62.1 MVA. Consequently, Meadow Springs did not exceed its NCR capacity limit in 2014 (as was stated in Western Power's original application) and, based on the growth rate and forecast assumed in the original application, would become non-compliant in the 2015/16 financial year rather than during 2015 as was originally projected.

Western Power's amended application noted the actual peak load for 2015/16 was 63.36 MVA. Therefore, Meadow Springs would have been non-compliant in 2015/16 (if the exemption had not been granted) regardless of which calculation method was adopted.

Western Power noted that, the effect of the capacity limit correction does not materially alter the requirement for an exemption, as the actual peak loading at Meadow Springs zone substation for 2015/16 exceeded the capacity limit, regardless of which calculation was used.

As discussed above, the ERA's assessment of Mr Davidson's application was suspended while the Electricity Review Board considered an application by Mr Davidson for a review of the ERA's decision to grant the exemption.

Following completion of the Electricity Review Board process in October 2018, the ERA asked Western Power to provide an update on the Meadow Springs exemption.

Mr Davidson made a further submission on his initial application in November 2018. A copy of the submission is included at Appendix 4.

Western Power provided the Meadow Springs exemption update in January 2019. A copy of the update is included at Appendix 3.

In its updated response, Western Power said that during the 2016 summer the Meadow Springs zone substation's actual peak load exceeded the NCR capacity limit, regardless of which calculation was used. Western Power forecast that the risk of non-compliance for the 2019 summer would exist until the installation of the Meadow Springs third transformer. Western Power expects the transformer will be in service in the first quarter of 2019 and will review then whether the exemption is still required.

The ERA is seeking comment from interested parties on whether the temporary exemption from compliance with clause 2.5.4(b) of the Technical Rules for capacity requirements at the Meadow Springs zone substation granted to Western Power in July 2015 should be revoked.

⁶ Included as Appendix 2 to this document.

Issue 1

The ERA is seeking comment from interested parties on whether the temporary exemption from compliance with clause 2.5.4(b) of the Technical Rules with respect to capacity requirements at the Meadow Springs zone substation granted to Western Power in July 2015 should be revoked.

The ERA is also seeking stakeholder views on the definition of the NCR criterion and the matters raised by Mr Davidson in his submissions on how the NCR capacity should be determined.

The current wording of clause 2.5.4(b), approved by the ERA on 9 November 2016,⁷ is as follows:

Normal Cyclic Rating (NCR) Criterion

- (1) The NCR risk criterion permits a limited amount of unmet demand for power transfer capacity following the unplanned loss of a supply transformer within a substation.
- (2) The maximum power transfer through a substation subject to the NCR risk criterion must be the lesser of:
 - (A) 75% of the total power transfer capacity of the substation, with all supply transformers in service; or
 - (B) The power transfer for which the maximum unmet demand for power transfer capacity following the loss of the largest supply transformer in the substation is equal to 90% of the power transfer capacity of the rapid response spare supply transformer.

As Mr Davidson has raised concerns that Western Power's interpretation of the NCR criterion has led to inefficient investment, the ERA asked Western Power to provide information on all zone substations subject to the NCR requirement. Western Power was asked to provide:

- a list of all NCR substations showing NCR capacities using both calculations.
- a list of all new transformers installed at NCR substations since network regulation commenced
- the current and projected load information for each NCR substation.

Western Power has provided the requested information which is included at Appendix 5. Western Power has identified all transformers installed at NCR substations since network regulation commenced in 2006 but notes:

- The dates provided are the actual installation dates of the transformers. The approval date for each investment would be a few years prior to it. Therefore some investments may have been approved prior to the first Access Arrangement and the introduction of the Technical Rules.

⁷

[https://www.erawa.com.au/cproot/14546/2/Final%20Decision%20on%20Western%20Power's%20Proposed%20Amendments%20to%20the%20Technical%20Rules%20\(Submitted%20April%202016\).pdf](https://www.erawa.com.au/cproot/14546/2/Final%20Decision%20on%20Western%20Power's%20Proposed%20Amendments%20to%20the%20Technical%20Rules%20(Submitted%20April%202016).pdf)

- The reason for the investment may not be limited to the Technical Rules 2.5.4.2 NCR criterion requirement, but may include other drivers such as asset replacement, customer connections and asset relocations or refurbishment.⁸

In the most recent access arrangement review for the period 2017/18 to 2021/2022, the ERA did not approve any expenditure resulting from the NCR requirement, except for completion of the Meadow Springs zone substation project.

Issue 2

The ERA is seeking stakeholder views on the matters raised by Mr Davidson about how the NCR capacity should be determined and the effect on investment decisions.

⁸ 2.5.4.2 Application of the NCR Criterion

- (a) The Network Service Provider may apply the NCR Risk criterion to zone substations in the Perth metropolitan area. Zone substations supplying essential services and zone substations where the application of the NCR Risk criterion is technically or economically unviable may be exempt from classification as NCR classified substations and must fully meet the N-1 planning criteria.
- (b) No zone substation may be classified an NCR substation unless a rapid response spare transformer is available to temporarily replace the failed supply transformer within a target period of 12 hours.
- (c) Following the loss of a supply transformer from an NCR classified zone substation, the Network Service Provider must use its best efforts to minimise load shedding by transferring load to other supply transformers or zone substations by utilising available spare capacity.
- (d) Following the deployment of the rapid response spare transformer, the Network Service Provider must install a suitable spare transformer or procure a new transformer to replace the failed transformer permanently and release the rapid response spare transformer to cater for future contingencies.

Appendix 1 Application from Mr Stephen Davidson

This Appendix is published as a separate publication on the ERA's website.

Appendix 2 Western Power – Clarification to Technical Rules exemption request

This Appendix is published as a separate publication on the ERA's website.

Appendix 3 Western Power – Update to Technical Rules exemption request

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Appendix 4 Submission from Mr Stephen Davidson following ERB process

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Appendix 5 Western Power – NCR substation capacities, load forecast and investment data

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