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

Appendix 1 - Application from Mr Stephen Davidson

Economic Regulation Authority
WESTERN AUSTRALIA

D197995

Economic Regulation Authority
Level 4, Albert Facey House
469 Wellington Street
Perth WA 6000

Attention: Elizabeth Walters

14th December 2016

Dear Ms Elizabeth Walters,

Ref: Authority's "*Determination on Application for exemption from certain requirements of the Technical Rules 2011 submitted by Western Power, Meadow Springs Zone Substation Exemption*" dated July 2015, that was published on the Authority's web site on 20 July 2015 (**Determination**)[1].

In accordance with section 12.45 of the Electricity Networks Access Code 2004 (**Access Code**) I respectfully apply to the Economic Regulation Authority (**Authority**) for the above exemption granted in respect of the covered network under section 12.41 to be revoked.

In my opinion, the effect of the Determination is inconsistent with the Access Code objectives of Section 2.1 to:

> *"... promote the economically efficient:*
>
> *(a) investment in, and*
>
> *(b) operation of and use of,*
>
> *networks and services of networks in Western Australia in order to promote competition in markets upstream and downstream of the networks*"

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

The issue raised here is important and urgent. It is important because it adversely affects industrial competitiveness and consumer welfare, that is jobs and living standards. It is urgent because preparations to privatise Western Power are well advanced.

We trust the Authority will be mindful of own obligation to consider public interest under Section 9(1), Division 3, Part 2 of the Electricity Industry Act 2004:

> "*The Authority must not exercise a power conferred by this Division unless the Authority is satisfied that it would not be contrary to the public interest to do so."*

Specifically, the Determination did not fulfill its obligation under Section 12.41 of the Access Code:

> "... *if the Authority determines that in all the circumstances the disadvantages of requiring the network persons to comply with the requirement* [SD: of the technical rule] *are likely to exceed the advantages*,"

[1] https://www.erawa.com.au/electricity/electricity-access/western-power-network/technical-rules/era-determinations-on-exemptions-from-the-technical-rules/meadow-springs-zone-substation

because the (literal) application of the technical rule 2.5.4(b) Normal Cycling Rating (NCR) Criterion, as stated in the Technical Rules, was not considered as an option.

Namely, in the Meadow Springs Zone Substation Exemption Application dated 15 May 2015 (**Application**)[2] Western Power ignored technical rule 2.5.4(b) of the Technical Rules and, instead, used own 'creative interpretation' of the technical rule 2.5.4(b). By doing so, Western Power breached Section 2.5(c) of the Access Code:

"*any applicable technical rule*".

On the other hand, in the Review[3] of the Application, technical consultant for the Authority (**Consultant**) uncritically accepted Western Power's 'creative interpretation' in lieu of the (literal) wording of the technical rule 2.5.4(b) Normal Cycling Rating (NCR) Criterion[4].

Consequently and by relying on the incorrect premise, the Authority arrived at a wrong conclusion - the Decision inconsistent with the objectives of the Access Code. The Romans' saying describing this flaw in logic is:

"*Conclusio sequitur partem periorem premise debiliorem*"[5].

Next Step

The option of the (literal) application of the technical rule 2.5.4(b) Normal Cycling Rating (NCR) Criterion (**Option**), as stated in the Technical Rules was considered in James Davidson's earlier submission to the Authority regarding a related issue (**Submission**)[6](attached here for ease of correspondence).

Unexpectedly, its technical content, including the Option, was not considered at the time Western Power Proposed Changes of the Technical Rules - April 2016 were discussed. The Submission was effectively sidelined by the comment:

"We have not analysed Mr Davidson's submission in this report."[7]

I believe that was a significant omission, and its content is central for the argument presented here too.

In the interest of WA electricity consumers I have been addressing you with the objective being to avoid overinvestment in the network. I specifically seek the Authority to:

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

[2] https://www.erawa.com.au/cproot/13583/2/Western%20Power%20application%20for%20tech%20rules%20exemption%20%20-%20Meadow%20Springs%20Zone%20Substation.pdf

[3] https://www.erawa.com.au/cproot/13764/2/Review%20of%20western%20power's%20application%20for%20a%20technical%20rules%20exemption%20for%20meadow%20springs%20zone%20substation.pdf

[4] The Consultant further recommended the "Western Power's creative interpretation" to become a new technical rule; which Western Power used in April 2016 as a key argument to amend the Technical Rules without conducting any techno economic analysis.

[5] The conclusion follows the weakest premise.

[6] https://www.erawa.com.au/cproot/14258/2/Steve%20Davidson%20April%202016%20Normal%20Cyclic%20Rating%20Clause%202%205%204%20(002).pdf

[7] https://www.erawa.com.au/cproot/14442/2/GBA%20report%20March%20and%20April%20%2016.pdf.

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

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

For further information or comment, please see contact details per below:

Attachment:

8-Jun-16, Public Submission - Issues Paper (WP Proposal of April 2016) - NCR Criterion - James Davidson[8].

Contact:

Name: Steve Davidson
Email: [redacted]

[8]https://www.erawa.com.au/cproot/14258/2/Steve%20Davidson%20April%202016%20Normal%20Cyclic%20Rating%20Clause%202%205%204%20(002).pdf.

Economic Regulation Authority
Level 4, Albert Facey House
469 Wellington Street
Perth WA 6000

Attention: Elizabeth Walters

3rd June 2016

Dear Ms Elizabeth Walters,

Proposed Amendments to Western Power's Technical Rules Submitted April 2016

It seems that the proposed change to Clause 2.5.4 may not actually result in improved efficiency of investment. In this submission I present some calculations which show possible outcomes.

Of course, the capacity of a substation increases with the addition of more transformers. I provide calculations in Table 1 that show precisely how much the capacity of a given substation increases and how it differs depending on the definition of NCR (Normal Cyclic Rating) in its current form and the proposed amended form.

For simplicity, I make the assumption that each transformer (including the RRST, Rapid Response Spare Transformer) has a capacity of 33 MVA. I have included N-1 substation capacity for illustration and as a sanity check because, as I understand it, the NCR capacity should always be similar to but slightly higher than the N-1 capacity.

Table 1 – Comparison of the three criteria shows that the proposed change leads to reduced substation capacity.

	Number of Transformers	1	2	3	4	5
	Sum capacity	33.0	66.0	99.0	132.0	165.0
Assumption	Capacity of each transformer (including RRST) for simplicity of calculations	33.0	33.0	33.0	33.0	33.0
N-1 now	N-1 substation capacity	10.0	33.0	66.0	99.0	132.0
NCR now	Permissible loss of load = min (33 * 75%, RRST * 90%) = 33 * 75%	24.8	24.8	24.8	24.8	24.8
	Capacity = N-1 capacity + permissible loss	24.8	57.8	90.8	123.8	156.8
NCR proposed	Maximum power transfer is 75% of the power transfer capacity, which is the sum capacity	24.8	49.5	74.3	99.0	123.8

Note: the “N-1” case is only illustrative, the cases to be compared are “NCR now” and “NCR proposed”.

Note: all values are MVA (Mega-Volt-Amperes).

Let me offer an explanation of my understanding that may clarify the way in which I have made the calculations in Table 1. Suppose that a substation comprised of homogenous transformers rated at 33 MVA were required to satisfy the N-1 criterion. The maximum capacity for a station with two transformers would be 33 MVA, the capacity of a single transformer. The maximum capacity for a station with three transformers would be 66 MVA, the capacity of two transformers, and so on.

The N-1 criterion is conservative, because it requires having what is essentially a spare transformer in each zone substation. The NCR risk criterion is less conservative, because it allows a population of zone substations of, say fifty North of the river, to share a single spare transformer (RRST). This is an enormous economic saving, given that each transformer costs say $10 million, whereas making a substation NCR requires a construction effort that is only a fraction of the cost.

According to Table 1, a substation of three transformers will have a capacity of 90.8 MVA under the current NCR definition but a capacity of only 74.3 MVA under the proposed redefinition of NCR. For a substation of four transformers, the capacities are 123.8 MVA and 99.0 MVA respectively which is a huge discrepancy.

A good definition of NCR is one which maximizes the capacity of substations in order to defer investment as long as possible. I hope that the calculations I have presented can prompt more analysis of the quantitative aspects of the proposed amendment.

Yours Sincerely,

James Davidson