

IN THE WESTERN AUSTRALIAN ELECTRICITY REVIEW BOARD

No / of 2017

Re: Application for review of the decision by the Economic Regulation Authority for amendment to the Technical Rules dated 2 March 2016 and titled "Three phase fault credible contingency".

Application by:

STEPHEN DAVIDSON

Applicant

APPLICATION FOR REVIEW

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Pursuant to Chapter 10 of the *Electricity Networks Access Code 2004 (the Code)* the Applicant applies for review of the decision made in November 2016 by the Economic Regulation Authority (**Authority**) and placed on the public register kept by the Code Registrar under the Code on or about 9 November 2016 whereby the Authority approved the proposed revised definition of the Credible Contingency Event submitted by Western Power Corporation on 3 November 2016 under section 12.50 of the Code – removing three phase faults from credible contingency scenarios for voltages at or above 66kV (i.e. the transmission system).

The application seeks the following final orders: -

1. The decision of the Authority be set aside or varied to give effect to the matters asserted in the grounds for this application.
2. Further or alternatively the Electricity Review Board to draft and approve a revised definition of the Credible Contingency Event, which gives effect to the matters asserted in this application.
3. Such further or other orders as may be appropriate.

The grounds for this application are annexed.

Applicant

*S. Davidson*

## GROUNDS

1. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving amendment to the Technical Rules dated 2 March 2016 and titled “Three phase fault credible contingency” by substantially relying on the inappropriate, for the purpose of changing the Technical Rules, clause and chapter of the National Electricity Rules (**NER**): clause 4.2.3(e) of Chapter 4 Power System Security.
  - (a) The above is evidenced from the purpose of NER Chapter 4. See Clause 4.1.1 Purpose, for example Clause 4.1.1(a)(iii):

*“to establish processes to enable AEMO to plan and conduct operations within the power system to achieve and maintain power system security;”*
  - (b) The acronym **AEMO** stands for the Australian Energy Market Operator.
  - (c) The NER Chapter 4, hence, applies to power system operation (including planning in the operational time frames), not to the design.
  - (d) In Queensland, New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania the AEMO operates the National Electricity Market (**NEM**) under NER Chapter 4.
  - (e) In Western Australia, the AEMO operates the South West Interconnected System (**SWIS**) under the Wholesale Electricity Market Rules (**Market Rules**), not the under the Technical Rules.
2. In addition, the proposed amendment to remove three phase faults from the definition of the Credible Contingency Event submitted by Western Power Corporation (**Western Power**) on 2 March 2016 was not in good faith and was misleading because past Technical Rules presentations by Western Power referred to NER Chapter 5 (not to NER Chapter 4). For example, at the System Restart Forum in Perth on 25 February 2015, titled “Technical Rules”.
3. Further, not in good faith and misleading, for the purpose of the proposed amendment, were assertions by Western Power that:
  - (a) *“This proposed amendment is supported by similar treatment for this type of event in National Electricity Rules (NER) jurisdiction ...”*, and;
  - (b) *“The NER ... do not include three phase earth faults as a credible contingency below 220kV,...”*.

as evidenced, for example, by the earlier submission(s) to the Authority during the process of creating the Technical Rules (then Technical Code) 2007. In contrast to 2016, at that time while defending its decision to retain inclusion of three phase faults into the list of Credible Contingency Events Western Power presented a different set of arguments proving that the retention was consistent with the practice in the NEM (the NER was then called the National Electricity Code). That important evidence was not presented in 2016.

4. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving for amendment to the Technical Rules dated 2 March 2016 and titled "Three phase fault credible contingency" when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that the Authority ought to have knowledge of and access, or could have caused access, to the Western Power's submission(s) of Item 3 here, containing substantial arguments relevant for decision making with respect to inclusion or otherwise of three phase faults into the list of Credible Contingency Events.
5. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving for amendment to the Technical Rules dated 2 March 2016 and titled "Three phase fault credible contingency" by not relying on the appropriate, for the purpose of changing the Technical Rules, Chapter 5 Network Connection, Planning and Expansion of the **NER** and, for example, to Clause 5.1.2 Purpose and Application.
  - (a) The above is evidenced from the purpose of NER Chapter 5. See Clause 5.2.1, for example Clause 5.2.1(a)(iii):

*"to address a Connection Applicant's reasonable expectations of the level and standard of power transfer capability that the relevant network should provide; "*
  - (b) The stated purpose for the proposed amendment is to increase power transfer capability, for which reference to NER Chapter 5 is relevant (not to NER Chapter 4).
  - (c) Refer to Clause S5.1.2.1 Credible Contingency Events:

*"The Network Service Providers must plan, design, maintain and operate their transmission networks ..."*

which demonstrates that NER Chapter 5 expressly applies to the Network Service Providers – Western Power in this case.

- (d) Clause S5.2.1(a) mandates, as a credible contingency, a single circuit three phase fault for all transmission lines operating at below 220kV:

*“The credible contingency events must include ... a single circuit three-phase solid fault on lines operating below 220 kV.”*

In Western Australia these are lines operated at voltage levels 132kV, 66kV, 33kV, 22kV, 11kV, 6.6kV and 0.415kV.

- (e) In addition and for technical reasons, Clause S5.2.1(b) further requires a single circuit three phase fault to be a Credible Contingency Event for a transmission line which features one of the following two designs:

- (i) *“not protected by an overhead earth wire and/or*
- (ii) *lines with tower footing resistances in excess of 10 ohms.”*

In a manner that:

- (iii) *“such lines must be examined individually on their merits by the relevant Network Service Provider.”*

In Western Australia these are lines operated at voltage levels 330kV, 220kV, 132kV and 66kV.

6. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving for amendment to the Technical Rules dated 2 March 2016 and titled “Three phase fault credible contingency” when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code by not considering safety to be a relevant issue.
7. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving for amendment to the Technical Rules dated 2 March 2016 and titled “Three phase fault credible contingency” when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code by not considering the impact of the Credible Contingency Events upon safety of equipment, plant, earthing systems, operators and public as is stipulated in Clause 2.5.8 of the Technical Rules.
8. Clause 2.5.8(c) of the Technical Rules mandates use of the Credible Contingency Events as an input for calculation of the fault duty:

*“Equipment ... where the fault level is unlikely to exceed the lower rating for credible contingency events.”*

9. Further, the Australian Standard AS3851-1991: *The calculation of short-circuit currents in three-phase. a.c. systems* mandates calculation of three phase faults during evaluation of the fault duty of the equipment.
10. The International Electrotechnical Commission (IEC) standard IEC60909: *Short-circuit currents in three-phase a.c. systems* mandates the calculation of three phase faults during evaluation of the fault duty too.
11. Failure to design equipment, plant and earthing systems to withstand the fault duty imposed by three phase faults or to achieve the required performance of providing adequate safety for operators and public is not a good industry practice. It may cause, damage, explosions, fires, harms, injuries and fatalities.
12. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving for amendment to the Technical Rules dated 2 March 2016 and titled "Three phase fault credible contingency" when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that its decision degraded safety below the acceptable level, as is explained in Items 6 to 11 here.
13. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving for amendment to the Technical Rules dated 2 March 2016 and titled "Three phase fault credible contingency" when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code whereby advising<sup>1</sup>:

*"Had the frequency of three phase faults been a concern we would have expected other stakeholders to raise the issue."*

This raises the following question:

- (a) What volume of concerns from stakeholders would trigger a regard for safety?
14. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving for amendment to the Technical Rules dated 2 March 2016 and titled "Three phase fault credible contingency" when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code whereby only

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<sup>1</sup> Geoff Brown & Associates: "*Review of Western Power's Application for Technical Rules Amendments*", *Final Report for Economic Regulation Authority*, 31 August 2016, p.6, 3<sup>rd</sup> last bullet point, last sentence.

explaining that the purpose of the proposed amendment is to increase the power transfer capacity, without providing neither specific examples nor the aggregate net financial benefit.

That was unexpected, given that the Technical Rules largely determine Western Power's Capital Expenditures (**CAPEX**) and the aggregate financial impact of a single rule change in the Technical Rules can be hundreds of millions of dollars of expenditures. These amounts are well in excess of the Regulatory Test threshold for a single project of \$30M for the transmission system and \$5M for the distribution system.

One would expect at least the same level of the techno-economic scrutiny for proposals to change the Technical Rules as that for the Regulatory Test.

15. One transmission line was mentioned in the proposal for amendment, the 220kV transmission line to the Eastern Goldfields (**EGF**) region. Its transfer capacity was declared to be 155MW and the proposal stated<sup>2</sup>:

*"The greatest impact ... will potentially be on Users with generating facilities in the Eastern Goldfields, where power transfer limits can affect network operations."*

The potential benefit was not explored nor quantified.

16. A public comment suggestion to verify whether the existing 155MW power transfer capacity limit of the 220kV EGF line was correctly determined (and whether it can be increased without changing the Technical Rules) was not followed up. That was unexpected, given that it would be straightforward to examine that document, required under Clause 2.3.8 of the Technical Rules. In addition to questions raised in sections (a), (b) and (c) of Item 13 here, the issues raised in this Item 16 also raise the following questions on has Western Power:

- (a) The list of its own regulatory compliance obligations?
- (b) Internal work procedures to ensure compliance with its own regulatory obligations?
- (c) Internal work procedures to ensure compliance with its own obligations arising from each applicable rule of the Technical Rules?

17. The Authority erred in its finding of facts or the exercise of its discretion was incorrect or was unreasonable having regard to all the circumstances in approving for amendment to the Technical Rules dated 2 March 2016 and

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<sup>2</sup> Section 2.6

titled "Three phase fault credible contingency" when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code whereby not exploring the issues raised in Item 15 and Item 16 here.