

Re: Application for review of the decision by the Economic Regulation Authority for exemption from compliance with the Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times dated 15 July 2015.

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 (**Decision**) made in July 2015 by the Economic Regulation Authority (**Authority**) and placed on the public register kept by the Code Registrar under the Code on or about 15 July 2015 whereby the Authority approved the exemption from compliance with the Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times submitted by Western Power Corporation on 12 May 2015 under section 12.40 of the Code – approving for Western Power to be exempt from compliance with clause 2.9.4 of the Technical Rules at the Wagin Zone Substation Weak-in-Feed.

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 establish the total amount and timing of the Capital Expenditures (**CAPEX**) Western Power spent on additional communication and SCADA upgrades, to connect Morton Seed and Grain's Private Parallel Generator (**PPG**), at Wagin Zone Substation mentioned in the Decision (the aggregate cost of which was not presented to the public nor apparently estimated at the time, to give effect to the matters asserted in the grounds for this application.

3. Further or alternatively, the Electricity Review Board to compile the list of PPGs¹ connected to the distribution system and transmission system since commencement of the first Access Arrangement.
4. Further or alternatively, the Electricity Review Board to determine the total amount and timing of the Capital Expenditures (**CAPEX**) Western Power spent since commencement of the first Access Arrangement on additional communication and SCADA upgrades to zone substations to connect PPGs of Order 3 here to give effect to the matters asserted in the grounds for this application.
5. Further or alternatively, the Electricity Review Board to remove from the Regulated Cost Base (**RCB**) the CAPEX amount(s) of Order 2, Order 4 and Order 12 here and to remove from the Regulated Asset Base (**RAB**) the assets of Order 2, Order 4 and Order 12 here to give effect to the matters asserted in the grounds for this application.
6. Further or alternatively, the Electricity Review Board to make the adjustments consequential to any order under Order 5 here, for Western Power to effectively pay back for any returns it received from inclusion of the CAPEX of Order 2, Order 4 and Order 12 here into the RAB to give effect to the matters asserted in the grounds for this application.
7. Further or alternatively, the Electricity Review Board to cause a review of the single line diagram(s) for the connection of all PPGs in the SWIN identified under Order 3 here in order to assess whether in each case:
 - a. Western Power enforced compliance with the Technical Rules, including with clauses 2.3.1(c), 2.9.2, 2.9.4, 3.1(b), 3.2.2, 3.2.3, 3.3.3.1, 3.3.3.1(c)(2), 3.4.7, 3.5.2(f), 3.6.7.2, 3.6.9(c), 3.6.10.1(g), 3.6.10.1(i) and 3.6.11?
 - b. Western Power equally treated all PPGs with respect to enforcing compliance with the Technical Rules under Order 7.a here?
 - c. Were the works efficient works?
 - d. Were the shared and connection assets correctly classified?
 - e. Did any installation with PPG(s) receive advantage (financial or risk mitigation) from any works above the efficient works or any incorrect classification of connection assets into shared assets, as determined under Orders 7.c. and 7.d. here?

¹ Not connected under Technical Rules clause 3.7

- f. Did Western Power receive regulatory advantage (financial or risk mitigation) from any works above the efficient works or any incorrect classification of connection assets into shared assets, as determined under Orders 7.c. and 7.d. here?
- g. The amount of Operational Expenditures (**OPEX**) Western spent to rectify power quality problems in the respective zone substation area in which any non-compliance was identified under Order 7.a here.
- h. Were the third party users of electricity in the SWIN disadvantaged (financially or by the risk mitigated away from the PPG or Western Power) from any works above the efficient works or any incorrect classification of connection assets into shared assets, as determined under Orders 7.c. to 7.g. here?
- i. Describe and quantify (in dollar terms) the aggregate financial (and, if possible, the risk mitigated away from the PPGs or Western Power) disadvantage the third party users of electricity in the SWIN received, as determined under Orders 7.c. to 7.h. here.

to give effect to the matters asserted in the grounds for this application.

- 8. Upon request, the Applicant may review the single line diagrams referred to in Order 7 here and conduct a preliminary assessment of Orders 7.a to 7.h.
- 9. Further or alternatively, the Electricity Review Board to cause an order for Western Power to rectify any non-compliance determined under order 7.a here and disadvantage determined under Order 7.i. here to the third party users of electricity in the SWIN, for example by reducing the RCB effective on 30 June 2017, which is the end date for the current Access Agreement (**AA2**) to give effect to the matters asserted in the grounds for this application.
- 10. Further or alternatively, the Electricity Review Board to cause review of adequacy of the rating of the (existing and new) equipment in the MSG plant and connection assets to withstand the increased fault duty imposed by the connection of the new 885kVA rated generator at its operation in Wagin.
- 11. Further or alternatively, the Electricity Review Board to compile the list of any requests by the AEMO (formerly known as the System Management² in WA) for installation of the switching equipment in parts of the SWIN covered by the Market Rules and of those requested by the Network Operations of Western Power for installation of the switching equipment in parts of the SWIN covered

² Note that the term “*System Management*” was not changed in the Technical Rules.

by Chapter 5 of the Technical Rules (not by the Market Rules) since commencement of the first Access Arrangement.

12. Further or alternatively, the Electricity Review Board to determine the total amount and timing of the CAPEX and OPEX Western Power spent on any design, construction and installation of the switching equipment in parts of the SWIN under Order 11 here to give effect to the matters asserted in the grounds for this application.
13. Further or alternatively, the Electricity Review Board to investigate completeness and adequacy of any Western Power's procedures for compliance with own regulatory obligations and exercise of its discretion under the Access Code and Technical Rules.
14. Further or alternatively, the Electricity Review Board to investigate completeness and adequacy of any Authority's procedures for compliance with own regulatory obligations and exercise of its discretion under the Access Code.
15. Further or alternatively, the Electricity Review Board to investigate whether the actions of Western Power and the Authority asserted in the grounds for this application amount to just a coincidence, cooperation or collusion, as well as what was the motive and intent.
16. Such further or other orders as may be appropriate.

The grounds for this application are annexed.

Applicant

S. Davidson

GROUNDS

Background

Societal

The issue raised here is important and urgent. It is important because any rise in electricity tariffs adversely affects Western Australian industrial competitiveness and consumer welfare, which is job and living standards. It is urgent because the current Access Arrangement expires on 30 June 2017 and the regulatory financial adjustments are made effective on that day.

Concern

Of concern is the extent to which the network investment (for example, Transmission Works to Connect Collgar Windfarm) will be financed by increasing the regulated network tariffs applying to all network users.

New Facilities Investment Test

Only that amount of the new facilities investment that meets the new facilities investment test can be added to the capital base of the network and recovered through regulated network tariffs.

Application of Clause 1.9.4

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 the exemption from compliance with Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that the Authority uncritically accepted Western Power's assertion that clause 1.9.4 requires costly upgrade of the Wagin zone substation, whereby no upgrade of the Wagin zone substation pursuant to clause 1.9.4 was required for the expansion of the Morton Grain and Seed's (**MSG**) operation in Wagin.
2. Namely, it was stated in the Issues Paper³:

³ Economic Regulation Authority, *Application for exemption from certain requirements of the Technical Rules submitted by Western Power - Wagin Substation Weak In-Feed*, Issues Paper, paragraph 13, page 3, June 2015.

“The Wagin substation is deemed to comply with the Technical Rules under clause 1.9.4 as it existed prior to 2007. However, for Western Power to connect MSG’s PPG and remain compliant with the Technical Rules, a substantial upgrade would be required at the Wagin substation including new 66 kV and 22 kV circuit breakers, current transformers and associated protection equipment. Western Power has estimated the upgrade cost at \$2 million, plus costs for additional communication and SCADA upgrades.”

3. However, the assertion of Item 2 here was not justified nor explained.

4. For the reasons of Item 3 here, the assertion of Item 2 here is just an unsubstantiated (and erroneous) opinion.

According to Paragraph 26 of the Decision, the Authority’s technical consultant apparently shares that view; further explaining the purpose of the \$2 million substation upgrade was to effectively (and unnecessary) ‘gold plate’ the Wagin zone substation but not to comply with clause 2.9.4 of the Technical Rules.⁴

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 the exemption from compliance with Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that the Authority uncritically accepted Western Power’s assertion that clause 1.9.4 requires costly upgrade of the Wagin zone substation of Item 2 here as a fact, whereby that assertion was just an erroneous opinion.

6. The applicant submits that, for Western Power to connect MSG’s PPG and remain compliant with clause 2.9.4 of the Technical Rules, the substantial upgrade of Item 2 here would NOT be required at the Wagin substation. This is explained in more details in Items 19 to 24 here.

Background on the PPG expansion of MSG’s Operation in Wagin

7. The MSG’s operation is located 7km away from the Wagin 66/22kV zone substation and supplied via a 22kV line emanating from it. It cannot be

⁴ Probably based on the information not publicly available.

ascertained from the information publicly available whether the 22kV feeder is dedicated or not to the MSG operation.

8. The expansion of the MSG's load user operation consists of a PPG.
9. After completion of the PPG expansion, the MSG's operation became a load and generator user. This requires consideration of the simultaneous operation of the MSG's loads and on-site generator.
10. When consuming electricity from the network, the MSG must meet the requirements of a load user.
11. The relevant point for assessment of the MSG's compliance with the requirements of the Technical Rules is the connection point. In the laymen's terms this is where the electricity is metered. Its location cannot be ascertained from the limited information publicly available.
12. The Western Power's request for exemption and the Authority's Decision are not explicit on whether the MSG is a High Voltage (**HV**) user or a Low Voltage (**LV**) user of electricity. Both are, however, explicit that the MSG's PPG is connected at the LV. These could be interpreted as leading readers to believe the MSG is a LV user or that the MSG PPG (in itself) is a stand-alone LV user that can be considered separately from the remainder of the MSG load operation. Adding to the apparent confusion, both documents are silent on whether the MSG PPG is connected to the Western Power's public LV distribution network or to the MSG's private LV installation. This vagueness and lack of clarity required to professionally assess technical design and its regulatory compliance is concerning.
13. The Technical Rules stipulate slightly different requirements for connection of PPGs to the LV distribution network from those to the HV distribution network. Although the safety and technical considerations are the same, the different requirements in the Technical Rules reflect technical difference between the LV and HV networks, the Applicant understands.
14. The additional requirements for plant, equipment and verification of the ongoing performance requirements at the connection point arise due to the connection of the on-site generator.
15. The Western Power's request for exemption and the Authority's Decision are silent on whether or not these additional requirements are complied with.

16. On 12 May 2015, Western Power submitted to the Authority the request for exemption from compliance with the requirements of Technical Rules clause 2.9.4 under section 12.40 of the Code at the Wagin Zone Substation.⁵
17. The request of Item 16 here described the PPG as a low voltage induction generator, rated 885kVA, intended to reduce the MSG's maximum demand, but not to export electricity into the public distribution network.
18. It shows the cost of works to comply with clause 2.9.4 of the Technical Rules is very high \$2M (for installing new 66kV and 22kV circuit breakers, current transformers and associated protection equipment in the zone substation) plus costs for additional communication and SCADA upgrades. The cost of the latter was not stated.

Application of Clause 2.9.4

19. The Applicant submits that the potential for non compliance with Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times arises only when one of the two 66kV supply transmission line to Wagin zone substation is disconnected, for either planned or unplanned reasons. No such a potential exists during periods of time when both 66kV lines are in service.
(The Authority shares this opinion, as evidenced, for example, from the 2nd sentence of the quote of Item 25 here)
20. Central to ensuring economically efficient compliance with the requirements of clause 2.9.4 is to identify the least cost engineering solution that would disconnect the MSG generator when it is in service and prevent its connection to the power system when it is out of service when the adverse circumstances described in Item 19 here exist.
21. The Applicant submits that least cost solution is the inter-trip of clause 3.6.11 of the Technical Rules⁶, where the inter-trip logic meets the functional specification of Item 20 here (via 'close enable' and 'disconnect' signals). Its

⁵ Western Power, "*Exemption Request – Wagin Zone Substation Weak-in-Feed*", Submission for Economic Regulation Authority, 12 May 2015.

⁶ Clause 3.6.11 Intertripping reads:

"In cases where, in the opinion of the Network Service Provider, the risk of undetected islanding of part of the distribution system and the Generator's facility remains significant, the Network Service Provider may also require the installation of an intertripping link between the Generator's main switch(es) and the feeder circuit breaker(s) in the zone substation or other upstream protection device nominated by the Network Service Provider."

implementation would ensure compliance with the requirements of clause 2.9.4 of the Technical Rules.

22. The least cost solution of Item 21 (needed for compliance with clause 2.9.4 of the Technical Rules) here was referred to as “*additional communication and SCADA upgrade*” in the Issues Paper (as quoted in Item 2 here).
(The Authority apparently shares this opinion, as evidenced, for example, from the 1st sentence of the quote of Item 25 here).
23. 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 the exemption from compliance with Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that the Authority uncritically accepted Western Power’s assertion that compliance with clause 2.9.4 for the expansion of the MSG operation in Wagin would require the Works quoted in Item 2 here, whereby the low cost compliant technical solution of Item 21 was not considered on its merits.
24. The Applicant submits that the low cost compliant technical solution of Item 21 here does not require the exemption the Authority granted in the Decision in respect of clause 2.9.4.
According to Paragraph 30 of the Decision, EnergySafety WA apparently shares that view.
25. 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 the exemption from compliance with Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that the Authority uncritically accepted Western Power’s assertion that the proposed design does not comply with clause 2.9.4 of the Technical Rules, whereby the design for which the exemption was granted apparently does comply with clause 2.9.4 of the Technical Rules.

Classification of Assets

26. It is stated in the Determination:⁷

⁷ Economic Regulation Authority, *Determination on Application for exemption from certain requirements of the Technical Rules submitted by Western Power - Wagin Substation Weak In-Feed*, Determination, Paragraph 18, page 3, July 2015.

“In order to reduce the risk exposure, Western Power is proposing that a SCADA style intertrip arrangement is put in place as an integral part of the connection. This is to ensure that the disconnection of the PPG only occurs at times when the 66 kV transmission lines supplying the Wagin substation are out of service for planned or unplanned outages.”

27. The statement of Item 26 here could be interpreted as referring to the term “*additional communication and SCADA upgrade*” of Item 22 here, because the communication is an integral part of any inter-trip.
28. The statement of Item 26 here could be further interpreted that the Works for the “*SCADA style intertrip arrangement is put in place*” / “*additional communication and SCADA upgrade*” referred to in Item 22 here, will be classified as shared assets and paid by all users of electricity in the SWIN through network tariffs, rather than by its causer - MSG.
29. Namely, as explained in Items 19 to 24 here, the Works to Connect MSG’s PPG considered by Western Power include additional communication and SCADA upgrades. These works provide new services to exclusively support the MSG operation and MSG’s PPG.
30. Prior to the MSG’s application for expansion of its existing operation by addition of the PPG, Western Power had no plans for communication and SCADA upgrades between the Wagin Zone Substation and MSG operation. No other user of the network is supplied from the MSG, other than the MSG’s loads and its PPG.
31. The Applicant advises that no benefit will be realised by existing customers as a result of the MSG’s PPG. Hence the Applicant submits that all Works to Connect MSG’s PPG should be classified as connection assets.⁸
32. 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 the exemption from compliance with Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that the Authority uncritically accepted Western Power’s inferred assertion that the Western Power proposed Works for the “*additional communication and SCADA upgrade*” (“*SCADA style intertrip arrangement is put in place*”) will be

⁸ Note for information the Access Code definition for connection assets is: for a *connection point*, means all of the *network assets* that are used only in order to provide *covered services* at the *connection point*.

classified as shared assets and paid by all users of electricity in the SWIN through network tariffs, whereas these Works should be classified as connection assets (so its cost is not passed to other SWIN users via network tariffs).

33. However, in the event that the Electricity Review Board determines that a portion of the Works to connect MSG's PPG should be classified as shared assets, the Applicant requests that the classification be explained so that reasoning can be reflected in future submissions on customer connection works.
34. Further or alternatively, it is stated in the Determination⁹ that MSG accepted such an arrangement:

"MSG has expressed its acceptance of the proposed connection arrangement and the associated operating restrictions..."
35. The statement quoted in Item 34 here is not surprising: who would not accept that others pay for their own connection?
36. In the Applicant's opinion, Western Power apparently made generous offer to MSG that other network users (effectively) pay for the Western Power's 'gift' of Item 34 here to MSG. In the Author's opinion, as a corporation, Western Power has right to spend their own money it wishes to do so, but not to shift the burden of its discretionary spending to other SWIN network users of electricity via regulated tariffs, when they do not benefit from that discretionary spending.

Application of Technical Rules Clauses Other Than Clause 2.9.4

37. The Applicant submits that the engineering design of the MSG's expanded operation, for which the requested exemption was granted, apparently does not comply with the requirements of the Technical Rules. This concern stems from the information publicly available on the Authority's web site, including from the public submissions.
38. The concern of Item 37 here needs to be investigated and, if confirmed, rectified at the Western Power's cost. It is important to:
 - (a) ensure safety and performance as stipulated in the Technical Rules;

⁹ Economic Regulation Authority, Determination on *Application for exemption from certain requirements of the Technical Rules submitted by Western Power - Wagin Substation Weak In-Feed*, Determination, July 2015, Paragraph 20, page 3.

- (b) the cost of enforcing compliance not to be passed to the SWIN network users via network tariffs.
39. The Applicant will highlight next key potential non-compliances of the MSG expansion design with clauses other than clause 2.9.4 of the Technical Rules, as inferred from the limited information publicly available.

Application of Clause 3.1(b) and Clause 3.6.10.1(i) Restricted Operation

40. Clause 3.1(b) reads:
“This section 3 assumes the times a User’s facility may operate will not be restricted, except in accordance with these Rules. Additional operating restrictions may be agreed by a Network Services Provider and a User. In such circumstances the Network Services Provider may impose requirements over and above those shown in this section 3 to ensure that the User’s facility only operates in accordance with the agreed restrictions. The additional operating restrictions and any additional requirements must be specified in the relevant connection agreement.”
41. Clause 3.6.10.1(i) reads:
“All small power stations that have an export limit shall have directional (export) power or directional current limits set appropriate to the export limit.”
42. Pursuant to clause 3.1(b) and clause 3.6.10.1(i), the requested non-exporting operation of Item 17 here requires a reverse power protection relay. This relay must be located at the connection point (where the MSG is connected to the public distribution system and its electricity consumption measured). The relay should be set to 0 (zero) export limit and instantaneous trip time, ie with 0 (zero) intentional trip delay time.
43. 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 the exemption from compliance with Technical Rules clause 2.9.4 Maximum Total Fault Clearance Times when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that the Authority granted the exemption for 1000milliseconds fault clearance time, whereby the 0 (zero) milliseconds trip delay time is required to comply with the requirements of clause 3.6.10.1(i) and clause 3.1(b).

44. The Applicant respectfully requests that the Electricity Review Board cause review of compliance of the MSG's operation with clause 3.1(b) and clause 3.6.10.1(i) as per Items 40 to 42 here and, if necessary, cause any non compliance to be rectified and the rectification cost not to be passed to other SWIN network users via regulated tariffs.

Application of Clause 3.5.2(f) and Clause 3.6.7.2 Main Switch

45. Clause 3.5.2(f) reads:

"If a generating unit is connected to the distribution system the Generator must provide a circuit breaker close inhibit interlock with the feeder circuit breaker at the Network Service Provider's zone substation in accordance with the requirements specified by the Network Service Provider.

This interlock is required in addition to the islanding protection specified in clause 3.5.2(d)(3) on account of the potential safety hazard if a de-energised distribution feeder was energised by an embedded generating unit."

46. Clause 3.6.7.2 Main Switch reads:

- "(a) Each facility at which a generating unit in a small power station is connected to the distribution system must contain one main switch provided by the User for each connection point and one main switch for each generating unit, where a generating unit shares a connection point with other generating units or loads. For larger installations, additional connection points and main switches or a dedicated feeder may be required.*
- (b) Switches must be automatically operated, fault current breaking and making, ganged switches or circuit breakers. The relevant facility may also contain similarly rated interposed paralleling switches for the purpose of providing alternative synchronised switching operations.*
- (c) At each relevant connection point there must be a means of visible and lockable isolation and test points accessible to the Network Service Provider's operational personnel. This may be a withdrawable switch, a switch with visible contacts, a set of*

removable links or other approved means. It must be possible for the Network Service Provider's operational personnel to fit safety locks on the isolation point."

47. Failures to comply with the requirements of clause 3.5.2(f) and clause 3.6.7.2 cause operational difficulties that typically result in higher than necessary Operational Expenditure (**OPEX**) to the Network Service Provider.
48. When the operational difficulties of Item 47 here reach a certain threshold, then, typically the AEMO (formerly known as the System Management¹⁰ in WA) may request installation of the switching equipment in order to alleviate the operational difficulties on parts of the SWIN covered by the Market Rules.
49. Similarly, the Network Operations of Western Power may also request installation of the switching equipment in order to alleviate the operational difficulties on parts of the SWIN that is covered by Chapter 5 of the Technical Rules (which are not covered by the Market Rules).
50. The Applicant respectfully requests that the Electricity Review Board cause review of compliance of the MSG's operation with clause 3.6.7.2 and clause 3.5.2(f) as per Items 45 and 46 here and, if necessary, cause any non compliance to be rectified and the rectification cost not to be passed to other SWIN network users via regulated tariffs.

Application of Clause 3.6.10.1(g) Earth Fault Protection and Sensitive Earth Fault Protection

51. Clause 3.6.10.1(g) reads:

*"All small power stations must provide earth fault protection for earth faults on the distribution system. All small power stations connected at high voltage must have a sensitive earth fault protection scheme."*¹¹
52. The Applicant respectfully requests that the Electricity Review Board cause review of compliance of the MSG's operation with clause 3.6.10.1(g) as per Item 51 here and, if necessary, cause any non compliance to be rectified and the rectification cost not to be passed to other SWIN network users via regulated tariffs.

¹⁰ Note that the term "System Management" was not changed in the Technical Rules.

¹¹ Note that, in order to perform these functions, the metering equipment must measure electrical quantities on the network side of the connection point.

Application of Clause 3.4.7 Power Factor

53. In essence, Clause 3.4.7 Power Factor requires that large distribution system users (>1MVA) maintain own power factor above the value of 0.9. Small users (<1MVA) are required to maintain own power factor above the value of 0.8. See Table 3.3 of the Technical Rules.
54. A combination of induction generator(s) type PPGs supplying predominantly motor loads is intrinsically prone to breaching the plant performance requirement of clause 3.4.7 Power Factor. Achieving compliance typically requires a remedial measure on the causer's side – MSG in this case.
55. Further or alternatively, customer installations with embedded inverter type PPGs operating at the unity power factor are also intrinsically prone to breaching the plant performance requirement of clause 3.4.7 Power Factor, regardless of the type of load, be it domestic, commercial, industrial or mixed.
56. It is much more cost effective to address the power factor issue on the customer's side of the connection point, rather than to fix the resulting problems on the public network side.
57. The resulting problems (due to non compliance with clause 3.4.7) on the public network include unacceptable over-voltages and under-voltages, leading to customer complaints, equipment failures, etc.¹²
58. These are addressed in operational time-frames, usually as power quality related remedial works. The rectification costs are typically classified as OPEX. These have large impact on the regulated tariffs and increases in the price of electricity.
59. In the Applicant's opinion, OPEX (or CAPEX) caused by the Network Service Provider's negligence or failure to exercise discretion granted to it under the Technical Rules (as well as any other regulation and legislation) to minimize costs should be born by the Network Service Provider and not passed to the SWIN network users via regulated network tariffs.
60. However, in the event that the Electricity Review Board determines that the Network Service Provider has no obligation to exercise own discretion in order to minimize the cost of electricity to network users via regulated network tariffs, the Applicant requests that the determination be explained so that reasoning can be reflected in future submissions on customer connection works.

¹² Note that these may also occur within the customer's own installation.

61. It is a regulatory challenge to identify the costs incurred under Item 58 here, in order to rectify problems of Item 54 here, and to ensure these are not included in the RCB (RAB).
62. This Application is an attempt to address the regulatory challenge of Item 61 here, on the example of the Wagin zone substation.
63. The Applicant respectfully requests that the Electricity Review Board cause review of compliance of the MSG's operation with clause 3.4.7 Power Factor as per Items 53 to 59 here and, if necessary, cause any non compliance to be rectified and the rectification cost not to be passed to other SWIN network users via regulated tariffs.

Application of Clause 3.2.3 User's Power Quality Monitoring Equipment

64. Clause 3.2.3 User's Power Quality Monitoring Equipment reads:
 - (a) *The Network Service Provider may require a User to provide accommodation and connections for the Network Service Provider's power quality monitoring and recording equipment within the User's facilities or at the connection point. In such an event the User must meet the requirements of the Network Service Provider in respect of the installation of the equipment and shall provide access for reading, operating and maintaining this equipment.*
 - (b) The key inputs that the Network Service Provider may require a User to provide to the Network Service Provider's power quality monitoring and recording equipment include:
 - (1) three phase voltage and three phase current and, where applicable, neutral voltage and current; and
 - (2) digital inputs for circuit breaker status and protection operate alarms hardwired directly from the appropriate devices. If direct hardwiring is not possible and if the Network Service Provider agrees, then the User may provide inputs measurable to 1 millisecond resolution and GPS synchronized."
65. Detailed power quality requirements in the Technical Rules require ongoing verification. Of concern for this section of the Application are those imposed by Technical Rules upon individual network users. Clause 3.2.3 details

technical interface requirements for their measurement and compliance assessment.

66. It is important to stress that the cost to the user (who causes the power quality non compliance at its own premises) to rectify the non-compliance would be considerably lesser than the cost the Network Service Provider would incur to achieve the same outcome.
67. For efficient operation of the power networks, it is essential to rectify power quality non-compliances at their source, not at the upstream network.
68. A prerequisite for achieving the objective of Item 67 here, is that the Network Service Provider exercise its discretion granted under clause 3.2.3 and require Users to provide accommodation and connections for the Network Service Provider's power quality monitoring and recording equipment within the User's facilities or at the connection point. Only then, the user's power quality non-compliance can be established and the Network Service Provider's request made to the user to rectify it.
69. Otherwise, if the Network Service Provider do not exercise its discretion or choose not to exercise its discretion of clause 3.2.3, the much higher rectification (OPEX) cost will be (eventually) born by the Network Service Provider and passed onto other network users via regulated tariffs.
70. It is a regulatory challenge to distinguish between the costs of Item 68 here and those of Item 69 here. The latter, if undetected, would result in avoidable, hence unreasonable, rises of the electricity prices to consumers.
71. The Applicant respectfully requests that the Electricity Review Board cause review of compliance of the MSG's operation with clause 3.2.3 as per Items 65 to 70 here and, if necessary, cause any non compliance to be rectified and the rectification cost not to be passed to other SWIN network users via regulated tariffs.
72. The requested assignment of Item 71 here includes a review on whether: a) Western Power has or not an internal procedure that ensures its own compliance with clause 3.2.3, and; b) the PPG expansion of the MSG plant was designed to facilitate the user's power quality monitoring equipment of clause 3.2.3.

Application of Clause 3.3.3.1(c)(2) as illustrated in Figure 3.2

73. The required reactive power capability of induction generators is specified in clause 3.3.3.1(c)(2) and Figure 3.2.

74. Of concern is the ability of the PPG induction generator installation to deliver in the capacitive range of Figure 3.2, ie to export the reactive power.
75. The Applicant respectfully requests that the Electricity Review Board cause review of compliance of the MSG's operation with clause 3.3.3.1(c)(2) and Figure 3.2 as per Item 73 here and, if necessary, cause any non compliance to be rectified and the rectification cost not to be passed to other SWIN network users via regulated tariffs.

Application of Clause 3.6.9(c) Communication Link

76. It is the obligation of the user, MSG in this case, to provide the communication link from its facility to the Western Power's control centre: Clause 3.6.9(c) last sentence (on page 83) reads:

“A Generator must provide a continuous communication link with the Network Service Provider's control centre for monitoring and control for generating units exporting 1 MVA and above to the distribution system. For generating units exporting below 1 MVA, non-continuous monitoring and control may be required e.g. a bi-directional dial up arrangement.”
77. The Applicant respectfully requests that the Electricity Review Board cause review of compliance of the MSG's operation with clause 3.3.3.1(c)(2) as per Item 76 here and, if necessary, cause any non compliance to be rectified and the rectification cost not to be passed to other SWIN network users via regulated tariffs.
78. The requirements of Clause 3.6.9(c) explicitly support the arguments presented in Items 26 to 31 here that the communication and SCADA works required for PPG expansion of the MSG's operation in Wagin should be classified as connection assets.

Application of Clause 2.3.1(c) Protection Equipment to be of Protection Equipment Quality

79. It is the explicit requirement of clause 2.3.1(c) of the Technical Rules that protection equipment meets the protection equipment standards applicable for the location and environment of its installation. Specifically, the standard IEC60255 applies for relays and AS60044 for voltage and current metering equipment. The latter supply input signals for operation of the former.

80. The standards for protection equipment are higher than those for the control equipment. Nowadays, control equipment is typically programmed to perform protection functions, however its operation is generally unreliable for the protection purpose, unless the measurement, signal transportation channels and signal processing devices are built to the standards applicable for the protection equipment.
81. The Applicant respectfully requests that the Electricity Review Board cause review of compliance of the protection equipment in the MSG's operation with clause 2.3.1(c) of the Technical Rules as per Items 79 and 80 here and, if necessary, cause any non compliance to be rectified and the rectification cost not to be passed to other SWIN network users via regulated tariffs.

Related Issue – ‘Blank Cheque’ Approval

82. Reference is made to the quote of Issue 2 here. Of concern is the cost of the works for ‘*additional communication and SCADA upgrades*’ when the cost of these works was not provided.
83. Namely, sections 6.9 to 6.12 of the Access Code, allow for the (end-of-the Access Arrangement period) adjustment of the regulated revenue resulting from any changes to the TR. (the relevant clause 2.9.4 was changed in November 2016). This apparent lack of transparency can be interpreted as effectively giving to Western Power a signed ‘blank cheque’ to withdraw the amount of customers’ money it chooses to do.
84. This applies generally when changing any rule of the TR when the cost benefit was not provided.
85. The opinion of the Electricity Review Board on adequacy of the practice of Issues 82 to 84 would be appreciated.

Related issue - Safety and public consultation

86. The Paragraph 23 of the Determination reads:¹³.

“It is noted in the submissions from Community Electricity, EFK Consulting Engineers, the Shire of Wagin and from Jim Chown

¹³ Economic Regulation Authority, *Determination on Application for exemption from certain requirements of the Technical Rules submitted by Western Power - Wagin Substation Weak In-Feed*, Determination, Paragraph 23, page 3, July 2015.

MLC, that granting the exemption will not of itself compromise safety or reliability of supply for other users.”

87. That comment could be interpreted that the Authority substantially relied on public submissions to assess safety.
88. The methodology of Item 86 is unlikely to deliver the required scrutiny under circumstances where (only) interested parties and those involved in the project make submissions favoring their own interests, mutual agreements, own work and any short-cuts made when assessing safety.
89. What was the basis for the opinions quoted in Item 86 here?
90. For example, was any safety assessment conducted or not to verify adequacy of the (existing and new) equipment in the MSG plant and connection assets to withstand the increased fault duty imposed by the connection of a 885kVA rated generator at the LV installation? If so, was the assessment conducted as per AS3851 requirements?
91. The Applicant respectfully requests that the Electricity Review Board cause review of adequacy of the rating of the (existing and new) equipment in the MSG plant and connection assets to withstand the increased fault duty imposed by the connection of a 885kVA rated generator at the LV installation, the need for which was explained in Items 88 to 90 here.

Related Issue – Other Installations with PPGs

92. Paragraph 21 of the Issues Paper¹⁴ reads:

“Further, Western Power states that refusal to connect MSG may be seen as an unnecessary barrier to connection because the connection will not be adding significantly to present risks and there may be a possible equity issue as the solar PV systems already connected to the feeder present similar risks.”
93. It shows that other “solar PV systems” were already connected to the feeder, apparently without Western Power seeking exemption from compliance with clause 2.9.4 of the Technical Rules.
94. The inference of the quote of Item 92 here is that Western Power have had inconsistent approach towards compliance: it did not seek the exemption

¹⁴ Economic Regulation Authority, *Application for exemption from certain requirements of the Technical Rules submitted by Western Power - Wagin Substation Weak In-Feed*, Issues Paper, paragraph 121, page 4, June 2015

when connecting the solar PV PPGs of Items 92 and 93 here, while it sought the exemption when connecting the MSG PPG.

95. The finding of Item 94 here also implies there are few non-compliant PPG connections on the 22kV feeder supplying the MSG facility, and possibly few other non-compliant PPGs on other 22kV feeders emanating from the Wagin zone substation.
96. The safety and power quality assessment needs to consider the effect of the simultaneous operation of multiple PPGs, including the residential solar PV systems connected under clause 3.7 of the Technical Rules.
97. The aggregate impact of the embedded generation connected to the same feeder and zone substation of Item 96 here does not seem to have been conducted, in case of the MSG's PPG expansion supplied from Wagin zone substation.
98. The generalization of the finding of Item 95 here here leads to a conclusion that there are many non-compliant installations with embedded PPGs across the SWIN, largely due to the inconsistent attitude towards safety and compliance of Item 94 here.
99. If (numerous) non-compliances (with the Technical Rules, aimed to keep the electricity prices low) of numerous PPG connections of Item 96 here remain undetected and their compliance was not enforced, then the electricity prices SWIN network users pay via regulated tariffs unnecessary and unreasonably rise. This reduces the competitiveness of the WA industry and lowers the living standards.
100. The adverse effects of Issue 99 here should be and could be rectified.
101. In accordance with the submission of Item 100 here, the Applicant respectfully requests the Electricity Review Board to cause a review of all PPG connections in the SWIN (not connected under clause 3.7 of the Technical Rules) in order to assess whether in each case Western Power and the Authority, as applicable, 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 the connection when this is inconsistent with the objectives and sections 12.1, 12.2 and 12.3 of the Code in that the Authority uncritically accepted Western Power's inferred assertion that the proposed design complies with all applicable clauses of the Technical, whereby the design for which the connection was granted apparently does not comply with all applicable clauses of the Technical Rules, including with clauses 2.3.1(c),

2.9.2, 2.9.4, 3.1(b), 3.2.2, 3.2.3, 3.3.3.1, 3.3.3.1(c)(2), 3.4.7, 3.5.2(f), 3.6.7.2, 3.6.9(c), 3.6.10.1(g), 3.6.10.1(i) and 3.6.11.

Related Issue – Approach not balanced

102. The approach taken by the Authority and Western Power does not seem to be balanced, as it does not provide adequate protection to consumers. For example, it is stated in the recent Authority's (technical consultant's) report:
- “This assessment is regardless of where the cost falls – in our view an inappropriate barrier to entry is created if the costs imposed on users are materially greater than the costs that Western Power would incur to achieve the same outcome.”*
103. In the Applicant's opinion, consumer protection would require the reverse to apply too, ie mandatory consideration of the least cost option. For example, in a recent submission to the Authority Western Power did not consider technical solutions where new facilities and equipment were owned by the causer and located on its premises, even when the cost to the causer/applicant would be materially lesser than the cost the Western Power would incur to achieve the same outcome. (These situations may not necessary arise due to breaches of the Technical Rules)
104. However, in the event that the Electricity Review Board determines that the Network Service Provider has no obligation to exercise own discretion in order to minimize the cost of electricity to network users via regulated network tariffs, the Applicant requests that the determination be explained so that reasoning can be reflected in future submissions on customer connection works.