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**To:**

**Att: Mr Lyndon Rowe**  
**Chairman**  
**Economic Regulation Authority**  
**Perth, WA**

By email: [publicsubmissions@erawa.com.au](mailto:publicsubmissions@erawa.com.au)

Dear Sir,

**Re: Comments on the proposed changes to the Western Power's Technical Rules, August 2011**

On behalf of Public Transport Authority (PTA), Perth, WA, we offer the following comments in relation to the proposed changes to the Network Rules

***Background***

Public Transport Authority owns and operates passenger railway services in Perth Metropolitan Area. Service is based on using Electric Multiple Units (EMU) that are powered at 25kV ac single phase and rated between 1 and 4 MW depending on the train consists. Due to the nature of operation, (frequent accelerations between stations, stopping at stations and signals and a varying number of units on the network during the day), the actual power taken from the network fluctuates from approx 5 to 100% of maximum demand within short periods (typically several seconds). EMU's propulsion system is also a source of harmonics.

At present, there are 5 railway substations, consisting of 2 or 1 power transformers at each site that are connected at 132kV Western Power transmission exit points and then transformed to 25kV. Transformers are connected across two phase 132kV supply. There is no 132kV 3 phase grid or connection present at any of the railway substations.

In 2009, at its Summers St railway substation, PTA has commenced work to install power quality compensating equipment to address the requirements of harmonics and power factor specified in Network Rules 2007. Project is in its final stage of commissioning and it is planned to be completed in September this year.

DACE Engineering has prepared project scope and tender document and, upon contract award, has been appointed to act as the contract superintendent.

*ELECTRICAL ENGINEERS SERVICING INDUSTRY*

*POWER CONTROL AUTOMATION*

### ***Comments***

In a process of preparation of tender documentation, project delivery and especially during the validation period, it has become apparent that there are several deficiencies in the present revision of Network Rules.

A review of the proposed changes indicate that not all of the issues appear to be satisfactory addressed. Please note that given there was no prior consultation with railway operator and a very limited time allocated for the public comments, the notes below shall be treated as preliminary only. We suggest that a briefing would be necessary and further discussions would be welcome.

The comments are:

#### *Power factor.*

- Proposed document does not specify a load range at which the required power limit shall be applied. It needs to be understood that railway load, unlike an industrial load, varies significantly during the periods of operation. At low power demand, the p.f. it would be expected to be much lower than the required levels.
- There is an urgent need to clarify and then to determine against which method of measurement of p.f. shall be validated.
- Document shall specify at which point the p.f. shall be measured.

#### *Harmonics.*

- The document does not specify a process how the customer limits are to be allocated.

#### *Grid Connection, Negative Phase Sequence Voltage*

- A new Clause 3.2.1 (d) (2) requires a customer's load to be connected across 3 phase 132kV supply. It needs to be understood that this is not possible in case of railway substations and against the present practice. PTA is in a process of expanding their electrified network and 2 new substations are being procured.

We are awaiting your response

Yours truly,

On behalf of Mr Fred Bahadori, Electrical Engineering Manager, PTA,

Jan Stelmach  
Principal Engineer

9<sup>th</sup> September 2011