



Department of Consumer
and Employment Protection
Government of Western Australia
EnergySafety

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Dear Peter

Western Power's Proposed Access Arrangement

Please find attached ESD's comments on the Proposed Technical Rules which I understand will be placed on ERA's website for public information.

As part of our technical support for ERA on the Reliability and Quality issues we will be forwarding, via e-mail, ESD's assessment of the economic aspects of the proposed Western Power Access Arrangements. As previously agreed this information will be provided for ERA's use as it sees appropriate, but will no doubt be collated with information from other sources prior to final judgements being made on its dissemination.

While I realise we have yet to formalise our mutual cooperation MoU, I believe our current level of interaction and support should continue until we can both find the time to discuss and sign it.

Yours sincerely

for

Albert Koenig
Director of Energy Safety

10 November 2005

Energy Safety Division Comments on WPC proposed Access Code

Draft Technical Rules – Version 1 as of August 2005

2.2.1 Frequency Variations

A range of 47 - 52.5 Hz has been specified. In the existing Western Power Transmission Access Code maximum variation specified was up to 52 Hz. Also, the figure of 52.5 Hz does not match with Table 2.1 and to other references such as in clause 2.6.9 under Steady State Frequency limits. More importantly, the Electricity Act 1945 specifies $\pm 2.5\%$, which is 48.75 Hz to 51.25 Hz so, until the Act is changed, these limits must be replicated under the Code.

Voltage Fluctuations (s 2.2.3) and Voltage Waveform Distortion (s 2.2.4)

Under Voltage Fluctuations (section 2.2.3) the requirements have been revised to include aspects of AS/NZS 61000.3.7:2001. Also, under Voltage Waveform Distortion (section 2.2.4) the requirements include aspects of AS/NZS 61000.3.6:2001. It has to be mentioned that the existing Western Power Transmission Access Code also has similar requirements. While the above standards are the latest available and have been adopted from IEC Standards, they do not set any particular levels of harmonics that must be met and could be enforced from a regulatory point of view.

For example in AS/NZS61000.3.6:2001 table 2 refers only to “indicative values of planning levels” While these values may be acceptable to adopt as absolute operating values, there is no linkage in the standard, as it essentially only dictates the methodology for determining whether a load may be connected to the system, not the limits on the system when the load is operational. This is also the situation for flicker limits.

The *Electricity (Supply Standards and System Safety) Regulations 2001* requires network operators to ensure that voltage fluctuations of electricity supplied to a consumer's electrical installation are compatible with the "threshold of irritability curve" for low voltage supply and "threshold of perceptibility curve" for high voltage supply. These curves are given in Schedule 4 (Voltage Fluctuation Limits) of the Regulations. The Regulations also require network operators to ensure that under normal operating conditions the harmonic voltage distortion of a network does not exceed the levels set out in the table in Schedule 5 (Harmonic voltage ratio limits at any point on the system, including background levels). These limits were taken from earlier Australian Standards that set limits for networks. Given the deficiencies

described above it is necessary for this part of the proposed Access Code to be modified to comply with current regulatory requirements. If Western Power wishes to establish different network interference limits, it should be done in full consultation with industry or preferably through the Standards Australia committee EL-052 which will ensure input from across Australia, so that there will be consistency across the industry, once the new values are adopted into regulatory requirements.

Tables 2.3 and 2.4 refer to transmission planning levels, which is incorrectly worded and should read as planning levels.

Table 2.5 for Negative phase sequence limits is incorrectly worded and should not be transmission limits, just limits.

Also in table 2.5 averaging times for negative phase sequence limits have not been specified. Specifying separate percentage limits for normal conditions and under contingency conditions would be more meaningful and provide guidance to Users of the system.

2.3 Stability

In 2.3.4.1 clarification is required as to whether the fault types indicated do represent the most severe disturbance conditions that may occur on the system to determine the stability of the system.

Types of credible contingencies may need to be more clearly defined for planning and operations purposes, for example if there are any lines over 66kV without overhead earth conductors and /or lines with tower footing resistances greater than 10 ohms, should the case of a single circuit three phase solid fault be considered to cover the increased risk to stability. Another possible credible contingency may include a fault condition together with the disconnection of any single generating unit or transmission line.

Figure 2.1 for temporary over voltages is not easy to read. A clearer picture is required.

Under 2.7 Safety Criteria, Network Safety is legislated by the Electricity (Supply Standards and System Safety) Regulations 2001, and Electrical Installation safety by the Electricity Regulations 1947 and Electricity (Licensing Regulations) 1991.

Under 2.11 Distribution Construction Standards Criteria, Network design, construction, maintenance, repair and operation is legislated by the Electricity (Supply Standards and System Safety) Regulations 2001, and work including the design and construction of electrical installations is legislated by the Electricity (Licensing Regulations) 1991.

Under 3.2.4.8 Protection of Generating Units from power system disturbances there is a comment in clause (b) that "Western Power shall bear no responsibility for any loss or damage incurred by the *User* as a result of a fault on either the *power system*, the *User's facilities* or within the *generating unit* itself", which does not appear to allow redress to be available to affected parties.

3.3.2 Design Standards

A *User's* installation must comply with the Electricity (Licensing) Regulations 1991 amongst other requirements such as the WA Electrical Requirements (which are called up by the former), which also deal with "service rules" and the interface with an external network.

3.4.2.5 Maximum Acceptable Total Fault Clearance Time

The Standard fault clearance times in Table 3.3 and 3.4 indicate a significant difference in circuit breaker fault clearance times for existing and new circuit breakers on Western Power's network. This means that *User's* facilities have to be designed to cater to the greater circuit breaker operating times, which could be considered as a barrier to entry. Moreover, slower operating circuit breakers can have a detrimental impact on system stability and safety. It is suggested that a funded replacement program by a certain date to eliminate this constraint is likely to provide a net benefit to the community in both economic and safety dividends and should be examined.