17 Moran Close
Bull Creek WA 6149
Ph: 9424 1887
Mob: 0427 449 230
Email: noel.schubert@shoobs.net

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Access Arrangement Review
Electricity Access
Economic Regulation Authority
PO Box 8469
PERTH BC WA 6849

also by email to: electricityaccessreview@era.wa.gov.au

Dear Sir

CALL FOR SUBMISSIONS ON WESTERN POWER'S PROPOSED ACCESS ARRANGEMENT REVISIONS FOR THE SOUTH WEST INTERCONNECTED NETWORK

Thank you for the opportunity to comment on Western Power's proposed Access Arrangement revisions. Please find my submission following. The submission recommends that the ERA ensure that Western Power:

1. Substantially increases its annual-peak demand management focus and effort. Western Power is to be commended for the demand management trials it is doing.
2. Introduce new Reference Services and Tariffs to help focus network users' attention on managing their "coincident demand" (their demand coincident with the annual network peak demand) rather than their "anytime maximum demand" as now;
3. Modify the Distribution Headworks Scheme to focus applicants/users on managing their demand that is actually coincident with the annual peak demand of the constrained part of the network requiring the headworks; and
4. Pay for network "line losses", without being able to just pass the charges through, to the extent that Western Power is able to influence the losses by design, construction, commissioning, operation and maintenance of the network;

all for the purpose of ensuring economically efficient investment in the network.

Without the above four items being implemented, each to its economically-efficient extent, the local and SWIN-wide network annual peak demands will continue to grow excessively and drive excessive capital expenditure and charges, for which approval is being sought in this proposed access arrangement revision.

I am happy to discuss any aspect of the submission and can be contacted on the above numbers or by email at noel.schubert@shoobs.net.

Yours sincerely

NOEL SCHUBERT
Senior Renewable Energy Engineer.
Former Demand Management Coordinator – SECWA/Western Power – between 1993 and July 2005

SUBMISSION ON WESTERN POWER'S PROPOSED ACCESS ARRANGEMENT REVISIONS FOR THE SOUTH WEST INTERCONNECTED NETWORK

In response to the large increases in capital expenditure and network charges proposed by Western Power I make the following comments.

There are three main causes of the need to undertake significant network augmentation or reinforcement at high capital cost:

1. Extension of the network, or augmentation of the existing network, to supply new or larger residential, commercial and industrial premises and facilities being constructed as a result of normal economic growth. This is a legitimate reason for the expenditure, although with the financial crisis and slowing of economic growth Western Power's forecasts for this should be revisited before approving the revisions being sought.
2. Replacement of existing ageing lines and equipment in the network which are beyond their safe and/or economic life. This is also legitimate.
3. Unchecked (unmanaged) and therefore unnecessarily high annual peak demand growth from new and existing consumer's facilities in parts of the electricity network both at a local level (local feeders, transmission lines and associated equipment (eg transformers etc)), and system-wide (the aggregated demand of the whole SWIN), due to sub-optimal demand management effort, programs and pricing. Excluding causes 1. and 2. above, there is still significant proposed capital expenditure driven by unmanaged annual peak demand growth in various parts of the SWIN.

It is this third cause of significant capital expenditure that requires more attention before agreeing to the large increases in capital expenditure and increases in charges to pay for the capital expenditure.

DEMAND MANAGEMENT

Western Power is to be commended for the demand management trials and programs it has started to implement, such as the "Beat the Peak" advertising campaigns of past summers, the air-conditioner cycling controls trial in Perth's western suburbs and the demand management work in the Denmark – Walpole area.

These are positive indications of attention to managing annual peak demands in the network. However there is a long way to go to make use of most of the opportunities where the savings from such programs exceed the implementation costs.

A significant amount of extra effort, expenditure and resources on well-designed and implemented programs is required from Western Power and Retailers to reach an economically efficient level of demand management in the SWIN.

Demand management programs can be very broad in nature from direct load control (a favourite of network operators), through energy efficiency programs to pricing, regulation and education to name a few categories.

Climate change is a major reason to include energy efficiency programs in the mix.

Distributed generation (renewable or conventional, including making use of customers' existing standby diesel generators) can be used to defer the need for network reinforcement if the right commercial arrangements are in place and the technical rules for connection are not more onerous than really necessary and a barrier to entry as has been the case in the SWIN to date.

It is recommended that the ERA instate an obligation on Western Power to actively encourage and facilitate the connection of distributed generation to defer the need to reinforce the network wherever the former is more economically efficient.

Specialist demand management companies or consultants should be used to identify, target, design, implement and monitor demand management and energy efficiency programs.

It is recommended that the ERA ensure that significantly increased proportion of Western Power's future expenditure is directed to economically efficient and effective demand management programs to defer network reinforcement where annual peak demand is the main driver, rather than just continuing to reinforce the network as the demand grows in an unconstrained way.

Pricing

A key requirement for demand management to be effective and sustained is having in place the appropriate pricing and reward systems. More cost-reflective network and retail pricing is a necessary prerequisite to economically efficient demand management.

Cost-reflective pricing based more on electricity demand (driven by time of day and season (really weather or extreme temperatures) is an important element of an effective annual peak demand management program.

Wholesale electricity prices have in recent years (since the start of the WEM) moved to more closely reflect real costs of supplying peak demand. We now need network pricing to also reflect the real costs of meeting peak demand so that combined with the wholesale market prices there is an even stronger signal seen by retailers and other large wholesale customers to manage demand. Retailers will then have more incentive to offer smarter tariffs with more cost-reflective pricing such as critical peak pricing.

At each opportunity where network users are charged for a network service, the charges should be structured to be sufficiently cost-reflective and precise that customers and other users (eg retailers) are focussed on the value of reducing their demand at the actual time and day of the year when the annual peak demand occurs that actually drives the need for the network reinforcement.

For example in locally constrained parts of the network like the feeders to Ravensthorpe, Denmark and Walpole, where the annual peak demand occurs at around 6pm on cold nights for less than two hours, customers should see from pricing and other demand management programs the high cost of their demand at those times. The same principle should apply for hot-weather annual peaking parts of the network.

At present customers in such locations requiring network reinforcement do not see any such price signals due to the lack of cost-reflectivity based on demand that exists in the current charges as described in the following sections. It is no wonder that annual peak demand is growing in an unconstrained manner and huge capital investment is looming to meet demand in these locations.

Lack of cost-reflectivity by demand
Three specific examples of charges in the SWIN that are not cost-reflectively based on electricity demand, to help drive beneficial customer and other user annual peak demand management SWIN-wide or locally, are as follows.

1. **Network Reference Tariffs**. New Reference Services and corresponding Reference Tariffs need to be designed and provided so that they are structurally more cost-reflective to feed into new retail tariffs (like critical peak pricing tariffs) to stimulate offering of improved retail tariffs that are more cost-reflective in turn to encourage "coincident demand" management.
2. **Retail Tariffs**, including the regulated (gazetted) tariffs, which are typically built up to include pass through of the existing insufficiently-cost-reflective network reference tariff charge component.
3. **Distribution Headworks Scheme Charges**, which charge relatively high charges per kVA of user demand irrespective of whether that demand occurs at the actual time of the local network annual peak (coincident demand), driving the need for the network reinforcement, or at some other time.

Each of these is discussed in more detail in the following sections.

NETWORK REFERENCE TARIFFS

The majority of existing network reference tariffs in the SWIN, for the major classes of customers, don't correctly reflect the real underlying fixed and variable network costs, cost drivers and the actual time they occur. They may be cost-reflective on average, but the averaging in their design has removed more precise time-of-day and demand-based price signals that would focus attention on the customer demand that actually drives the need for network reinforcement.

This means these tariffs do not signal to customers correctly to shift consumption from the critical peak periods to off-peak periods - periods when there is plenty of spare network and generation capacity.

The following table comments on each of the network reference tariffs and how they are not structured correctly to be sufficiently cost-reflective and encourage customers to reduce their demand at times that matter to the network.

Network Reference Tariff	**Comments**
RT1 & RT2 – Anytime Energy	No time-of-use signals. Therefore not structurally cost-reflective. No incentive to reduce demand at any particular time.
RT3 & RT4 – Time of Use Energy	More cost-reflective, although off-peak charges seem higher than marginal network off-peak variable costs and therefore somewhat discourage customers from shifting consumption from peak to off-peak, to reduce network peak demands and costs of supply. Do not signal customers to reduce demand at the actual time the network peak demand occurs.
RT5 – High Voltage Metered Demand	Charges are based on **any-time** maximum demand (over a rolling 12-month period) with a discount based on proportion

Network Reference Tariff	Comments
	of off-peak energy out of total energy. Does not properly reflect the main, real drivers of network costs (annual network peak demand and the time it occurs) – the customer's contribution to which, drives network capital expenditure. Anytime maximum demand does not encourage customers to move their maximum demand away from the system peak and help reduce it. They are charged for the same demand no matter when their anytime maximum demand is. Unless a customer is so large that they cause their part of the network to peak at the same time as their own maximum demand, and so drive network capacity and capital expenditure, **a more appropriate basis for the charges would be "Coincident Demand" - Customer demand coincident with when the network peak occurs.**
RT6 – Low Voltage Metered Demand	As above.
RT7 – High Voltage Contract Maximum Demand	As above, with Contract Maximum Demand substituted for Anytime Maximum Demand. It does not encourage customers to move their demand away from the annual network peak that drives network capital expenditure. **Customer coincident demand - coincident with the network peak - would be a better signal and basis for the charges.**
RT8 – Low Voltage Contract Maximum Demand	As above.

It is recognised that these network tariffs were originally designed to cover the network services that matched the corresponding gazetted retail tariffs that existed at the time and still exist.

New network reference services and tariffs should be developed and made available in future to more correctly reflect the true customer demand contributions (coincident demand) at the times that actually drive network costs – ie when the network annual peak demands occur, typically on the hottest weekday afternoons of the year, or in some local parts of the network on the coldest evenings of the year.

The standard electronic metering already installed, or being installed, in the premises of large numbers of customers these days is capable of measuring customers' coincident (half-hourly) demand and customers could be billed on this basis if the necessary meter reading and billing systems were modified.

If this is not done, then simply passing existing network charges through to customers results in retail tariffs (or network charges if shown separately on the bill) that are not properly cost-reflective. Off peak charges will be higher than they should be, and on-peak charges or demand charges will not be as high as they should be and the demand charges will not apply correctly at the actual times that matter to the network.

The result will be less incentive for customers to help reduce the annual system peak demand, and more network reinforcement at higher capital cost will be required.

Large sums of capital are being spent on network upgrade projects because of peak network loads, but network and retail tariffs are not generally structured to focus customers on reducing their demand at the times of annual network peak that drive the need for the upgrades.

RETAIL TARIFFS

Retail tariffs need to be made more cost-reflective by making more use of the electronic metering which is so prevalent now and will be more so in future, and by introducing critical peak pricing and other more cost-reflective tariff structures.

I refer you to my draft discussion paper[1] submitted to the Office of Energy in July 2008 on the Review of Electricity Tariff Arrangements. This paper can be made available on request. It discusses many of the shortcomings of the existing suite of regulated (gazetted) tariffs and recommends introduction, as the standard default tariffs, of a range of more cost-reflective tariffs as a necessary pre-requisite to more effective annual peak demand management.

DISTRIBUTION HEADWORKS SCHEME CHARGES

This scheme charges relatively high charges per kVA of user demand irrespective of whether that demand occurs at the actual time of the local network annual peak driving the need for its reinforcement, or at some other time. Significant state government rebate subsidies are also paid to soften the financial impost in some localities.

This scheme could be significantly enhanced by Western Power, without a lot of effort, to make it an effective network demand management tool in its own right for Western Power to use and manage/promote. It would also reduce the resultant financial burden on customers (headworks charges) and Government (rebate) if it is enhanced, as well as reducing the rate of annual peak demand growth that drives the network expenditure.

[1] Discussion paper on the April 2008 Draft Recommendations Report, Review of Electricity Tariff Arrangements Office of Energy Report to the Minister of Energy, June 2008, by Noel Schubert.

Recommendations and discussion:

- The recommendation is that the headworks $/kVA.km charges for new supply connections, or increased capacity of existing connections, are based on the actual kVA demand for each applicant that will occur at the actual time of the annual peak demand of the constrained part of the network that will require upgrading - ie based on their coincident demand (coincident with the relevant network peak) rather than a kVA demand that may occur at some other time and which will not cause the need for any network upgrade.
- The Denmark feeder is an example of a winter peaking feeder, which has a very distinct evening peak (eg. 6pm to 7.30pm). This is largely due to residential heating.
- As an example, if the Denmark feeder annual peak is between 6pm and 7:30pm on cold evenings (probably really only on a holiday long weekend), then charging the kVA headworks charge based on each applicant's kVA demand only during the actual annual peak demand period (as narrowly defined as possible to what really matters to the network - 6pm to 7:30 pm on cold evenings on long weekends) will provide each applicant with the incentive and opportunity to work out as many ways of keeping their demand at those important times as low as possible.
- Suggestions on how to do this (there are many ways) could be provided as part of a demand management information program supporting the headworks scheme. Dairy farmers could install ice-storage chilling systems to continue to chill the milk while their refrigeration compressors are turned off for the relatively short peak period. The economics of this would depend on the kVA charges for coincident demand to apply during the actual network peak. Shop owners could turn off unnecessary equipment for the short peak and/or schedule closing time to suit the peak. There are many other opportunities to manage demand at these times.
- The narrower the time period, the greater the ability of applicants to respond to the signal to manage demand when it really matters, and the greater the response will be (reduced kVA demand).
- It empowers the applicant to save headworks charges (and Government rebates) more easily by managing their demand when it actually matters to the network.
- Higher demand from these applicants at other times does not really matter to the network, or cause the need for network augmentation. In fact it increases utilisation of the network at other times and maintains normal network revenue.
- An applicant who does not contribute to the relevant network peak should not be charged a headworks charge because they are not contributing to the need for network augmentation.
- In hot-weather-peaking network locations, the appropriate hours and days should be chosen - as narrow as possible whilst adequately covering the relevant network annual peak period.
- The modern electronic metering being installed these days for new/upgraded connections also allows the possibility of an additional headworks charge to be made at a later date by Western Power if the customer exceeds (at the time of the network peak) their kVA demand applied for.
- There are also practical measures that could also be taken to ensure customers do not exceed, at the time of the local network annual peak demand, the kVA demand they have paid for in the headworks charges.

Given that the scheme has been established to help fund distribution reinforcement to increase peak demand network capacity, there should be some relief/dispensation given to applicants who will not increase the demand during the annual peak demand periods.

The proposed changes to the scheme:

1. require little change to the structure of the scheme
2. would be based on the "User pays" principal
3. provide a strong signal to new Users to shift their demand to off-peak periods (where possible)
4. provide some good news (relief) for commercial Users in regional areas
5. can be incorporated with a demand management scheme.

The land developer would need to pass on to future owners/occupiers the obligation/commitment to keep their kVA demand at the time of the network peak below the "booked" kVA paid for in the headworks charges. This could be done in a number of ways through various formal mechanisms or agreements and be monitored by normal electronic metering.

LINE LOSSES

The current WEM rules for treatment of line losses do not provide an economically efficient financial incentive for Western Power to manage and reduce line losses because the whole cost of line losses is borne by the Retailers and other large wholesale purchasers of electricity.

Western Power can influence line losses by the way in which it designs, constructs, commissions, operates and maintains the network facilities.

Climate change and greenhouse gas emissions reduction is another strong reason for reducing line losses.

When the load on a network circuit doubles, the “line losses” increase by a factor of four. Such line losses result in considerable lost energy, with associated emissions. The network and generation capacity taken up to supply line losses is significant, and is not available to supply customer load.

Western Power must have sufficient financial incentive to reduce line losses in order to stimulate an economically efficient response, to help contain network capital and operating costs.

To the extent that Western Power is able to influence line losses, WP should bear the cost of those losses, without being able to pass those losses directly through to users.

CONCLUSION

I recommend that the ERA give due attention to these aspects in considering Western Power’s proposed Access Arrangement and initiate improvements in these areas to help contain network expenditure and charges into the future.

NOEL SCHUBERT
Senior Renewable Energy Engineer. Former Demand Management Coordinator – SECWA/Western Power – between 1993 and July 2005