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16<sup>th</sup> January 2006

## **260/05: Consultation on Electricity Distribution Use of System Charging Modification Proposals: Central Networks and United Utilities – Reactive Power Charges**

Dear Mark,

Thank you for the opportunity to respond to the consultation on Central Networks and United Utilities' modifications related to Reactive Power charges. It is our view that it is not obvious that the proposals better meet the licence objectives. Greater consideration is needed before any changes are introduced particularly as the revenue falls outside the price control.

This response will consider reactive power charging generally, and then look specifically at generator reactive charging.

### **General Principles**

1. We agree that it is economically efficient for reactive power charges to reflect costs. The relevant costs would be both system capacity related and losses related. However, the definition of costs is not straight-forward because the requirements of the customer interact with the demands of systems.
2. It would appear appropriate that the separation of kW and kVAr related costs give a clear message to customers as to whether it is economically efficient for them to invest in compensation. However, as reactive power charging sits outside the price-controlled revenue this is not possible. Indeed, it is essential that the level of DNO revenue sitting outside the price-control is reasonably small otherwise the control is weakened significantly. Since active and reactive power are intrinsically linked, it is inappropriate to place one component outside the price control. To do so gives DNOs the prospect of windfall gains at the expense of customers. The costs of running the network, including those relating to poor power factor, should be covered within the price-controlled revenues. If it remains without then there is an additional revenue stream with no additional costs. In our view, the licence obligations regarding Charging Methodologies are a more appropriate vehicle to encourage economically efficient charging signals.
3. There appears to be a consensus that 0.95 is an acceptable power factor, but there is no apparent analysis to support this, making it an arbitrary figure. Whilst DNOs will need to address costs as individual entities, consistency of treatment is highly desirable on grounds of supplier efficiency. The basis for calculation of power factor or average power factor should be unambiguous and detailed in the DNO LC Charging Methodologies. The calculation of average power factor should involve consideration of

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- both imported and exported kVARh whilst generating, i.e. be based on a net import, or net export, of reactive power.
4. The DNO Charging Methodologies, in their current state of evolution, and in particular the absence of published models, make an assessment of any proposed modifications difficult, as there is insufficient detail.
  5. Reactive power imported and/or exported should be correctly attributed to accompanying times of active import or export. kVARs imported or exported whilst generating should not form part of the calculation to determine Import Capacity or Import Power Factor. Similarly, kVARs imported or exported by a load (MW import) should not form part of the calculation to determine Export Capacity or Export Power Factor. Correct attribution may demand more sophisticated metering systems.

### **Generator Reactive Power Charges**

Whilst we appreciate being given the opportunity to comment on the specifics associated with the proposed changes to UU methodology for charging generators for excess reactive power, we believe that the issue of generator reactive charging forms a relatively small part of this consultation and that the complex issues associated with generator reactive charges are worthy of a fuller standalone consultation. For example, this consultation does not call for views on how a generator may be rewarded for reactive power, i.e. in cases where its provision benefits the system.

The 'Consultation on the longer term charging framework (May 2005)' recognised (in Section 4.44) that the issues associated with demand power factor 'may not hold true' for the case of generator power factor. The May 05 consultation document also recognised that 'further consideration is needed to determine the most appropriate mechanism to charge or reward generator reactive power'. We would therefore suggest that consideration is given to a fuller standalone consultation to tackle the issues associated with generator reactive power. The views sought by Ofgem with regard to generator reactive charges can, we believe, only be comprehensively addressed via such a consultation.

The specific points below partly address the questions raised by Ofgem in this consultation, but also provide additional points for future consideration.

In summary, we would suggest that any generic solution which always results in a generator being charged for excess reactive power and that takes no account of local operating conditions is inappropriate. Locational signals in reactive power charges are probably even more relevant than in active power charges.

### **Capacity Charges**

Generators connecting under the pre 1st April 05 deep connection charging regime will, where necessary, have paid for upstream distribution system reinforcement based upon their contracted network capacity, in MVA. This contracted network capacity will normally be recorded in the site's Connection Agreement as a MW capacity and associated worst case full load power factor. Generators falling into this category and remaining within their contracted capacity should not be liable for any form of reactive charging until at least 2010. Application of charges post 2010 should be subject to the outcome of the on-going consultations on longer term charging frameworks.

Generators connecting under the new post 1st April 05 shallowish charging regime will still contribute to upstream distribution according to their contracted network capacity, in MVA. Furthermore most DNOs' levy the GDUoS charge based on MVA (rather than MW) and generators are therefore already paying GDUoS at level influenced by their requirement for off-unity power factor operation. Generators falling into either category who exceed their contracted capacity, due to poor power factor, should be required to comply with the minimum permissible power factor under the terms of their Connection Agreement, i.e. to ensure the generator corrects the power factor.

### **Grid Code Reactive Capability Requirements**

The Grid Code, or certain Bilateral Agreements with NGET, requires certain categories of distributed generation to provide a defined range of reactive capability. Whilst, this range may (or may not) be limited to 0.95 power factor at 100% MW output it requires the capability to be able to operate at considerably lower power factors at lower MW load levels. A generator should not be exposed, under current or future dispatch mechanisms, to reactive charges that are as a direct result of providing a system service that assists the transmission system operator.

### Voltage Control Systems

A generator's automatic voltage control operating within a distribution system will adjust its reactive output in order to seek to attain its target voltage. This can result in operation at extreme power factors, particularly at low outputs. Here also it would be perverse for a generator to be exposed to reactive charges that are as a direct result of being asked or required to operate in voltage control by either the DNO or transmission system operator.

### Requested Extreme Power Factors

On occasions generators are asked, by a DNO, to operate at extreme power factors in order to avoid voltage rise issues within a distribution system. This too would be a case where the generator should not be exposed to reactive charges that might be applied as a direct result of being asked or required to operate at an extreme power factor.

### Specific consultations questions

- It is unclear whether the proposed modifications are more cost-reflective as there is no detailed analysis supporting either the existing arrangements or the new proposals.
- They may be local circumstances that justify differences in approach by the DNOs to reactive power charging, but it remains desirable to have a common approach.
- kVA charges may appear to reflect assumed reactive costs but whether they do so efficiently is unsubstantiated. Separation of kW and kVAr charges would appear useful in encouraging efficient investment, but re-combining them in some arbitrary fashion is likely to lead to the prospect of over-charging. A customer exhibiting a poor power factor is certainly likely to be penalised by both kVA and Reactive Power charges. It is not clear that each charge is recovering different additional costs.
- Losses, attributable to poor power factors should be part of the reactive power charge, since this would better reflect costs. It also argues that reactive power charges cannot be separated and placed outside the Price Control.
- We believe a separate consultation is required to tackle the issues associated with generator reactive power. The views sought by Ofgem with regard to generator reactive charges can, we believe, only be comprehensively via such a consultation.
- It is not obvious that the proposals meet the objectives. More consideration is needed before any changes are introduced particularly as the revenue falls outside the price control.

Yours Sincerely

Terry Ballard  
Economic Regulation