Worked Examples UU/2007/001 Title: Proposal to amend Licence Condition 4B Statement 2007/08 to incorporate updates to the Worked Examples suite. Organisation's Name: United Utilities Electricity PLC Details of Proposer: Frank Welsh (Policy Manager) Name: Organisation: United Utilities Electricity PLC Telephone Number: 01925 233365 Email Address: mailto:frank.welsh@uuplc.co.uk Description of the Proposed Modification: As part of the 2007/08 annual review of its Licence Condition 4B Statement (Connection Charging Methodology and Charges) United Utilities proposes to make changes to the existing Worked Examples and include a new Worked Example, within section 6. Reasons for the change with an explanation of how the proposed change better meets the relevant objectives: This proposal has been brought forward to ensure the examples better describe how we calculate connection and reinforcement charges, and to add a new example to aid the customer's understanding of the Cost Apportionment Factor rules. These changes better meet 'relevant objectives' (b) and (c) as the better descriptions and inclusion of a new Worked Example will help customers to understand the likely charges associated with typical new connections to United Utilities distribution network and facilitate competition in the provision of connection services. Proposed wording for the methodology statement and (if applicable) the charging statement: The proposed changes are shown below. A full strikethrough version of the changes can be found in the attached Licence Condition 4B Statement. Example 1 - A new connection to a domestic premises A customer requests a 230 V single phase 100 amp supply to a new house in an urban location. The new premises can be connected to an existing LV main cable in a nearby street. The assets provided from the point of connection to the customer's premises are fully chargeable as a new connection. Existing LV mains cable > POC Chosen route for service cable Estimated cost of contestable activity Cost 15m Service cable, excavation in footpath to customer £ laid duct, backfill and termination

Cost

£

Estimated cost of non - contestable activity

Single Service breech joint and joint hole

Estimated Connection Charge

The estimated cost of this connection is \pounds (VAT is not applicable to new domestic connections).

Example 2 - New connections on a domestic housing development

A housing developer requests connections for 200 domestic premises. A new distribution substation will be established to provide the collective load requirement of the site. To meet the required engineering design and specifications as regards security levels, the substation will be looped into the existing HV network and this is the minimum cost scheme. The assets provided from the points of connection to the developer's premises are fully chargeable as a new connection.



Example 9 - New connection for distributed generator requiring reinforcement

The connection of 3 MVA distributed generator involves the upgrading of 500 m of overhead line (between points A and B on the distribution network) to carry the export capacity of the distributed generator, the upgrading of the switchgear at point A for increase fault level on the distribution network and the laying of 500 m of new cable (between B and the customer's installation). Point B is the point of connection for the distributed generator.



The switchgear replacement will increase the fault level from 150 MVA to 250 MVA.

Estimated cost of contestable activity

	Cost
Provision and laying 500 m HV cable	£

Estimated cost of non - contestable activity

	Cost
Construction of 500 m HV overhead line	£
Provision and installation of new switchgear (<u>11 Panel</u>)	£
HV pole top termination	£

Estimated Connection Charge

- 1. The assets and work concerned with the connection only are charged in full to the customer. Estimated connection charge is £ (ie £ for contestable assets and £ for non-contestable assets).
- 2. The network has been reinforced by upgrading the HV overhead line and replacing the switchgear. The cost of these assets and associated work is apportioned to the customer using the appropriate Cost Apportionment Factor.

The switchgear upgrade is required to remove fault level constraints, whilst the overhead line upgrade is required to remove capacity constraints.

Fault level contribution from connection = 10 MVA New equipment fault level = 250 MVA Customer required capacity = 3 MVA New network capacity governed by switchgear rating = 5 MVA

Fault Level CAF = (3 x 10)/250 x 100% = 12% Security CAF = 3/5 x 100 % = 60% The reinforcement re-apportionment charge for the new switchgear = £ x 12% = £ The reinforcement re-apportionment charge for the overhead line = $\pounds x 60\% = \pounds$

3. Total estimated cost of this connection = $\pounds + \pounds + \pounds = \pounds$

Example 10 - New connection of a 70MW generator to the 132kV network.

An application for a new 70 MW distributed generator connection is requested. The point of connection is onto an existing 132kV overhead line. To allow the full generation export capacity of 70MW, part of this line has to be uprated (between points A and B on the diagram) by re-conductoring to give a circuit capacity of 213MVA.

Contestable works include installation of the new 132kV substation including a metered breaker, 132kV cable, a 90MVA 132/33kV grid transformer, 33kV switchgear and outgoing 33kV circuits to the wind turbines.

Non contestable works include the re-conductoring of the existing line, and the final connection from the line to the new 132kV substation.



Estimated Connection Charge

- 1. <u>The assets and work concerned with the connection only are charged in full to the customer</u>. Estimated connection charge is £X for contestable works and £X for non-contestable).
- 2. <u>The network has been reinforced by re-conductoring 15km of overhead line and</u> replacing 10 towers to accommodate the larger conductor. The cost of these assets and associated work is apportioned to the customer using the appropriate Cost Apportionment Factor.

Customer required capacity = 70 MVA

New network capacity = 213 MVA

Security CAF = 70/213 x 100% = 32.86%

The reinforcement re-apportionment charge for the overhead line = $\frac{\text{£} \times 32.86\%}{\text{1} \times 32.86\%}$ =

3. Total estimated cost of this connection = $\pounds + \pounds =$

A timetable for the implementation of the modification and charge changes:

United Utilities intends to publish the amended Licence Condition 4B Statement on 1st April 2007.