STATEMENT OF CHARGING METHODOLOGY FOR USE OF SCOTTISH HYDRO ELECTRIC POWER DISTRIBUTION PLC'S DISTRIBUTION SYSTEM

(WITH ~~LICENSED IDNO~~EHV Interim CHANGES)

Effective from 1st April 2010~~9~~*

The methodology set out in this~~is~~ statement was approved on ~~12th August 2009~~[ ] by the Gas and Electricity Markets Authority.

***Appendix 1 of this Statement effective from 1st May 2009**

Scottish Hydro Electric Power Distribution plc
Registered office:
Inveralmond House
200 Dunkeld Road
Perth
PH1 3AQ
Registered No: SC213460

Price: £5

SSE Power Distribution is a trading name of: SSE Power Distribution Limited Registered in Scotland No. SC213459; Scottish Hydro Electric Transmission Limited Registered in Scotland No. SC213461; Scottish Hydro Electric Power Distribution plc Registered in Scotland No SC213460; S+S Limited Registered in Scotland 214382 (all having their Registered Offices at Inveralmond House 200 Dunkeld Road Perth PH1 3AQ); and Southern Electric Power Distribution plc Registered in England & Wales No. 4094290 having its Registered Office at 55 Vastern Road, Reading, Berks, RG1 8BU
www.scottish-southern.co.uk

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STATEMENT OF CHARGING METHODOLOGY FOR USE OF SOUTHERN ELECTRIC POWER DISTRIBUTION PLC'S DISTRIBUTION SYSTEM

General

After the Introduction section and the Use of System Charging Principles, this statement is split into two parts:

PART A refers charges for HV and LV connected users that are covered by the Common Distribution charging Methodology (CDCM).

PART B1 refers to charges for EHV and legacy HV demand users that are not covered by the CDCM. The methodology for setting these charges is that used prior to 1 April 2010.

PART B2 refers to charges for EHV generation. The methodology for setting these charges is based on that used prior to 1 April 2010.

Introduction

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~~General Introduction~~

Who we are

SSE Power Distribution is a trading name of Southern Electric Power Distribution plc, Scottish Hydro Electric Power Distribution plc and Scottish Hydro Electric Transmission Ltd, part of the Power Systems division of Scottish and Southern Energy plc. Scottish Hydro Electric Power Distribution plc is the licensed electricity distribution business which operates networks in the north of Scotland. It also owns and operates small, embedded distribution systems in other parts of Scotland. This statement is produced by Scottish Hydro Electric Power Distribution plc, referred to in this statement as SHEPD, in accordance with the requirements of its electricity distribution licence.

~~Licence Obligations~~

~~This statement describes the Use of System Charging Methodology under which authorised users will be charged for use of SHEPD's electricity distribution system. SHEPD is obliged, under Condition 4 of its electricity distribution licence, to prepare a statement approved by the Authority setting out the methodology upon which charges will be made for the provision of Use of System. We are also obliged to review our Use of System Charging Methodology statement annually and to make such modifications to the Use of System Charging Methodology as are necessary for the purpose of better achieving the 'relevant objectives' defined in the same condition of the licence.~~

~~The relevant objectives are :~~

~~(a) that compliance with the Use of System Charging Methodology facilitates the discharge by the licensee of the obligations imposed on it under the Act and by the Licence;~~

~~(b) that compliance with the Use of System Charging Methodology facilitates competition in the generation and supply of electricity and does not restrict, distort or prevent competition in the transmission or distribution of electricity;~~

~~(c) that compliance with the Use of System Charging Methodology results in charges which reflect, as far as reasonably practicable, the costs incurred by the licensee in its distribution business; and~~

~~(d) that, so far as is consistent with sub paragraphs (a), (b) and (c), the Use of System Charging Methodology, as far as is reasonably practicable, properly takes account of developments in the licensee's distribution business.~~

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Words and expressions used in this statement have (unless specifically defined herein) the definitions given to them in the Act or the licence and shall be construed accordingly. Charges and costs are current at the time of publication and will not be changed, except as provided for in the relevant agreement for use of system and subject to Condition 4 of the licence.

SHEPD's electricity distribution system is subject to the terms and conditions of the Distribution Code as approved from time to time by the Gas and Electricity Markets Authority (the Authority). In exceptional cases, other parties may be entitled to use of the system under special arrangements to be agreed with SHEPD.

This statement has been approved by the Gas and Electricity Markets Authority. A fee of £5 (excluding VAT) will be payable for each copy of this statement which is provided in accordance with a request.

Price Control

SHEPD's licence contains conditions relating to price control of the revenue that SHEPD is allowed to charge for the provision of regulated services including use of system. In this way, the amount of revenue that SHEPD is allowed to recover from its customer base annually and over the price control period is governed by the detailed terms of its licence. Use of system charges may vary year on year as SHEPD sets its use of system charges to recover its allowed revenue.

Use of System

SHEPD will levy use of system charges for use of its network for the supply of electricity to end-users and for the transportation of electricity across its network from entry points. SHEPD's use of system tariffs are published in our Licence Condition 4A Use of System charging statement.

Users entitled to use SHEPD's electricity distribution system are those who are authorised by licence or by exemption under the Act to supply or generate electricity ("Authorised Electricity Operators"). In order to protect all users of the system, SHEPD will require evidence of authorisation before agreeing terms for use of the system. NOTE: In the rest of this commentary, requirements applying to authorised persons or Authorised Electricity Operators should be taken to mean Licensed Suppliers, Licensed Embedded Electricity Distributor or Licensed Generators only.

Connection and Use of System Boundary

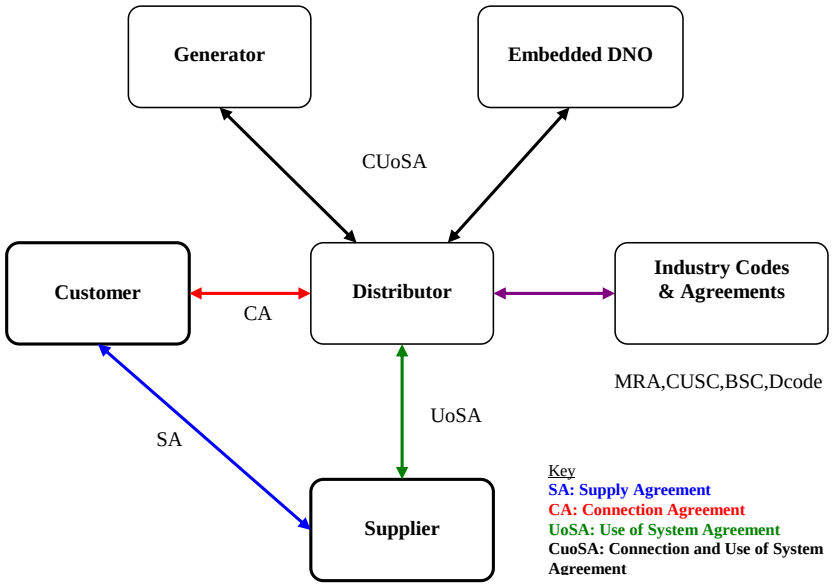
There is a point at which SHEPD splits the recovery of costs between connection to the distribution network and on-going use of system charges for utilisation of the network. The boundary point is common for both demand and generation customers. This statement details the charging methodology that is applied for the calculation of use of system charges. The Licence Condition 4A Statement details the actual use of system charges to be applied, whilst the Licence Condition 4B Statement details the Connection Charging Methodology that is used for calculation of connection charges. These statements can be obtained from our web-site at

www.scottish-southern.co.uk/ssegroup/contractmanagement.asp

or are available on request at a cost of £5 by following up the contact details on page 6.

The Contractual Framework

The following flowchart shows the contractual framework for a customer trading either Supplier Volume Allocation (SVA) or Central Volume Allocation (CVA) Settlements.



Users seeking to use the system will be required, prior to using the system, to enter into an agreement with SHEPD setting out the obligations of both parties. The party seeking use of the system will be required to:

- pay all charges due in respect of use of the system as described in our Licence Condition 4A statement and the accompanying schedules;
- be a party (where the user is a Licensed Supplier or a Licensed Embedded Electricity Distributor) to the Master Registration Agreement (MRA) for the provision of metering point administration services within SHEPD's authorised area;
- enter into any necessary arrangements with NGC for use of the transmission system to reflect arrangements under BETTA, unless SHEPD is informed by NGC that this is not required in any particular case;

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- be a party to the Balancing and Settlements Code; and
- comply with the provisions of the Distribution Code (a copy of which is available at a charge of £30 per serviced copy or £15 per unserviced copy plus packing, postage and VAT from SHEPD on request).

If the applicant and SHEPD fail to agree contractual terms, or any variation of contractual terms proposed by SHEPD, either party may request settlement by the Authority.

While the terms and conditions in the agreements will be consistent with those in this statement, the agreement will take precedence. Where an Authorised Electricity Operator, having entered an agreement for use of SHEPD's electricity distribution system, ceases for whatever reason to be an Authorised Electricity Operator with respect to that use of the system, then the entitlement to use of the system will cease forthwith, but the operator will continue to be liable under the agreement unless and until the agreement is terminated. In order to avoid any liability in this regard, an Authorised Electricity Operator wishing to terminate his agreement or wishing to notify a change should give SHEPD no less than 28 days' notice. SHEPD will normally respond within 28 days of a notification of change.

Terms and conditions for connection of premises or other electrical systems to SHEPD's electricity distribution system are contained in our Licence Condition 4B document titled "Statement of Charging Methodology for Connection to Scottish Hydro Electric Power Distribution plc's Distribution System" which is available from our web site at:

www.scottish-southern.co.uk/ssegroup/contractmanagement.asp.

It is also available on request at a cost of £5 by following up the contact details below. Persons seeking use of the system with respect to a new connection point, must apply for connection in accordance with the terms and conditions described in that statement.

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Contact Details

This statement has been prepared in order to discharge SHEPD's obligation under Condition 4 of the licence. If you have any questions about the contents of this statement please contact us at the address shown below. Also given below are contact details for the Office of Gas and Electricity Gas Markets should prospective users wish to enquire separately on matters relating to this statement.

Licence Obligations

This statement describes the Use of System Charging Methodology under which authorised users will be charged for use of SHEPD's electricity distribution system in 2010/11.

SHEPD is obliged, under Condition 13 of its electricity distribution licence, to prepare a statement approved by the Authority setting out the methodology upon which charges will be made for the provision of Use of System. We are also obliged to review our Use of System Charging Methodology statement annually and to make such modifications to the Use of System Charging Methodology as are necessary for the purpose of better achieving the 'relevant objectives' defined in the same condition of the Licence.

The relevant objectives are :

- that compliance with the Use of System Charging Methodology facilitates the discharge by the licensee of the obligations imposed on it under the Act and by the Licence;
- that compliance with the Use of System Charging Methodology facilitates competition in the generation and supply of electricity and does not restrict, distort or prevent competition in the transmission or distribution of electricity;
- that compliance with the Use of System Charging Methodology results in charges which reflect, as far as reasonably practicable (taking account of implementation costs), the costs incurred by the licensee in its Distribution Business; and
- that, so far as is consistent with sub-paragraphs (a), (b) and (c), the Use of System Charging Methodology, as far as is reasonably practicable, properly takes account of developments in the licensee's Distribution Business.

Words and expressions used in this statement have (unless specifically defined herein) the definitions given to them in the Act or the Licence and shall be construed accordingly.

SHEPD's electricity distribution system is subject to the terms and conditions of the Distribution Code as approved from time to time by the Gas and Electricity Markets Authority (the Authority). In exceptional cases, other parties may be entitled to use of the system under special arrangements to be agreed with SHEPD.

The methodology detailed in this is statement has been approved by the Gas and Electricity Markets Authority. .
This statement can be obtained from our website, www.ssepd.co.uk, or is available on request at a cost of £5 by following up the contact details on page 6.

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Price Control

SHEPD's licence contains conditions relating to price control of the revenue that SHEPD is allowed to charge for the provision of regulated services including use of system. In this way, the amount of revenue that SHEPD is allowed to recover from its customer base annually and over the price control period is governed by the detailed terms of its Licence. Use of system charges may vary year on year as SHEPD sets its use of system charges to recover its allowed revenue.

Use of System

SHEPD will levy use of system charges for use of its network for the supply of electricity to end-users and for the transportation of electricity across its network from entry points. SHEPD's use of system tariffs are published in our Licence Condition 14 Use of System charging statement.

Users entitled to use SHEPD's electricity distribution system are those who are authorised by licence or by exemption under the Act to supply or generate electricity ("Authorised Electricity Operators"). In order to protect all users of the system, SHEPD will require evidence of authorisation before agreeing terms for use of the system. NOTE: In the rest of this commentary, requirements applying to authorised persons or Authorised Electricity Operators should be taken to mean Licensed Suppliers, LDNOs or Licensed Generators only.

Connection and Use of System Boundary

There is a point at which SHEPD splits the recovery of costs between connection to the distribution network and on-going use of system charges for utilisation of the network. The boundary point is common for both demand and generation customers. This statement details the charging methodology that is applied for the calculation of use of system charges. The Licence Condition 14 Charging Statement details the actual use of system charges to be applied, whilst the Licence Condition 13 Statement details the Connection Charging Methodology that is used for calculation of connection charges. These statements can be obtained from our web-site, www.ssepd.co.uk,.

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The Contractual Framework

The following flowchart shows the contractual framework for a customer trading either Supplier Volume Allocation (SVA) or Central Volume Allocation (CVA) Settlements.

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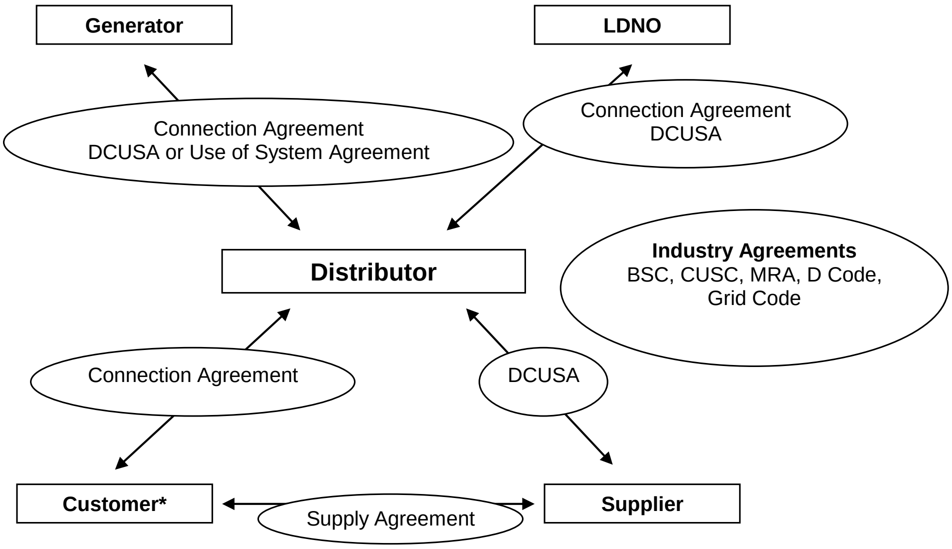

* demand or generator

Users seeking to use the system will be required, prior to using the system, to be a party to the Distribution Connection and Use of System Agreement (the DCUSA) or (if appropriate) enter into an agreement with SHEPD setting out the obligations of both parties . The party seeking use of the system will be required to:

- pay all charges due in respect of use of the system as described in our Licence Condition 14 statement and the accompanying schedules;
- enter into any necessary arrangements with NGET for use of the transmission system unless SHEPD is informed by NGET that this is not required in any particular case;
- be a party to the Balancing and Settlements Code; and
- comply with the provisions of the Distribution Code (a copy of which is available at a charge of £30 per serviced copy or £15 per unserviced copy plus packing, postage and VAT from SHEPD on request).

If the applicant and SHEPD fail to agree contractual terms, or any variation of contractual terms proposed by SHEPD, either party may request settlement by the Authority.

While the terms and conditions in the agreements will be consistent with those in this statement, the agreement will take precedence.

Terms and conditions for connection of premises or other electrical systems to SHEPD's electricity distribution system are contained in our Licence Condition 13 document titled "Statement of Charging Methodology for Connection to Scottish Hydro Electric Power Distribution plc's Distribution System" which is available from our web-site at:

www.ssepd.co.uk

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Contact Details

This statement has been prepared in order to discharge SHEPD's obligation under Condition 13 of the licence. If you have any questions about the contents of this statement please contact us at the address shown below. Also given below are contact details for the Office of Gas and Electricity Gas Markets should prospective users wish to enquire separately on matters relating to this statement.

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~~London~~
~~SW1P 3GE~~
~~Tel: 020 7901 7000~~
~~http://www.ofgem.gov.uk~~

Use of System Charging Principles

Pursuant to the requirements of Condition 13 ~~Pursuant to the requirements of Condition 4 of the licence, the following numbered paragraphs relate to the transport of electricity on SHEPD's system by Authorised Electricity Operators to or from exit points from the system, and to the transport of electricity on the system for supply to Authorised Electricity Operators and to generators including customers with on-site generation.~~

~~1.Where a supply of electricity is provided over electric lines or electrical plant comprising a part of SHEPD's electricity distribution system, a charge for use of the system will be levied either on the Supplier of the electricity or the embedded Distributor. The relevant charges are described in our Licence Condition 4A Statement and are payable by reference to the characteristics of the supply, in accordance with the categories of supply described in the section headed 'Notes on Use of System Tariffs'.~~

~~2.The charges for each category of supply depend upon the criteria that determine eligibility for that category, including the voltage of connection to the system, the characteristics of the load, and installation of the appropriate use of system metering.~~

~~3.The charges for use of the system reflect:~~

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- the costs of providing, operating and maintaining the electricity distribution system to the standards prescribed by the Act other than those costs which are recovered through charges paid to SHEPD's in respect of connection to the system, such that electricity can be transported efficiently through the system to exit points or from entry points; and
- the costs to SHEPD of providing certain services and performing functions for Authorised Electricity Operators, on terms that SHEPD is under a duty to offer under its licence, in order to support the operations of a fully competitive supply market in its authorised area. These services include: Meter provision services; Metering Point Administration Services; Energisation and De-energisation and Re-energisation services; Revenue Protection Services; and Radio Teleswitch Services. SHEPD is either wholly or partly remunerated through use of system charges or through transaction charges for these services. The cost for provision of these services is detailed in our Licence Condition 4A Statement.

All charges for use of the system include a reasonable return on the relevant assets, and the revenues arising from the charges are subject to price regulation in accordance with the terms of the licence.

4.Charges to Suppliers and Licensed Embedded Electricity Distributors for the use of the system are evaluated as if from SHEPD Bulk Supply Point. These charges reflect real electrical flows on the system and the need to provide adequate capacity at all voltage levels to protect the security of the system. Paragraph 10 may also be relevant. Charges are applied to the electricity as measured at the exit or entry points, as indicated in paragraph 5 below.

5.The charges for use of the system may include some or all of the following elements:

- a **standing charge** to cover the costs which do not vary with the extent to which the supply is taken up. This consists of a daily or monthly rate per site;
- an **availability charge** per kVA to cover the system capacity at each voltage level which is attributed to the connection;
- a **unit charge** per kWh unit delivered to the exit point from the system, designed to reflect utilisation of the system at all relevant voltage levels. Units for metered supplies are based on actual meter readings or profiled consumption based on actual meter readings and/or estimated annual advances. Units for unmetered supplies are based on the certified estimated annual consumption of an inventory of unmetered equipment; and
- **transactional charges** for certain services provided by SHEPD on an individual basis to Licensed Suppliers. Details are given in our Licence Condition 4A Statement.

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6.The standing charge for use of system noted in paragraph 5 above may include, (dependant on tariff), an amount to reflect the cost of the service cable to the premises and its termination, a contribution to the cost of the local network except as recovered within the connection charge, the costs of data processing, maintaining customer records, the costs of the registration service in accordance with the Master Registration Agreement and the cost of use of system billing and collection.

The Availability Charge (available capacity charge) recovers an amount, other than that recovered through the connection charge, towards the costs of providing and maintaining the network. With the exception of licensed Embedded Distribution Networks (see 15 below), this charge will be based on the agreed available capacity when the connection is first provided, or a modification made to existing connection arrangements. The agreed available capacity will remain unchanged for a minimum period of 5 years for demand and 15 years for generation, and availability charges will be payable on this capacity basis. After this period any agreed reduction to the connection capacity will be limited to once per annum. These constraints are in place to ensure that the assets are sized for optimum utilisation on an enduring basis, thereby enabling the company to meet its statutory duty to "develop and maintain an efficient, co ordinated and economical system of electricity distribution".

7.The charges for use of system exclude charges for the provision of distributor metering and data services in SHEPD's distribution services area. The terms and conditions for the provision of non half-hourly distributor metering and data services are detailed in a separate statement.

Full details of our metering charges are available in our Licence Condition 36B document titled, 'Statement of Charges for Scottish Hydro Electric Power Distribution plc's Distributor Metering and Data Services. This statement can be obtained from our web site, www.scottish-southern.co.uk/ssegroup/contractmanagement.asp, or is available on request at a cost of £5 by following up the contact details on page 7.

Authorised persons seeking use of the system shall procure that the Meter Operator, Data Collector and Data Aggregator appointed for each metering point supplied in relation to which the supply of electricity is measured by the metering equipment for the purposes of Settlement, shall provide SHEPD with any data required to be provided to SHEPD, without charge, by the person appointed in that capacity under, as appropriate, the Distributor Metering and Data Services Agreement, Data Collection Services Agreement or Data Aggregation Services Agreement in accordance with the timescales specified in such agreements. Whether SHEPD is appointed to carry out this task or the supplier installs his own energy metering, SHEPD reserves the right to install use of system metering equipment and apply an additional charge for this equipment.

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8.Charges for use of system will normally be payable on demand, in accordance with the billing period and payment terms agreed with the party using the system. SHEPD reserves the right to require appropriate security in respect of the charges estimated to arise, depending on the circumstances of the supply and on the basis of the agreed payment terms. Interest payment may be applied to late payments. Invoices for residential and most business supplies will generally be calculated according to the Supercustomer Methodology for Use of System Billing, a description of which is given in our Licence Condition 4A Statement. However, for supplies with complex pricing structures driven by site-specific components, site-specific invoices will be rendered, listing the supplies to which the invoice refers, the information about the supply on which the charge has been calculated, and the amount due for each supply identified in the invoice.

9.Where a supply is to be provided wholly or partly over SHEPD's electricity distribution system to an exit point from that system, the Supplier or embedded Distributor must demonstrate that at all times the quantity of electricity entering the system for the purpose of providing that supply equals the metered quantity delivered from that exit point plus the amount of electrical losses appropriate to the voltage at which the supply is delivered and to the source of the supply, as shown in the schedule of loss adjustment factors in our Licence Condition 4A Statement. Relevant metering information or being a party to the Balancing and Settlement Code will be considered to be adequate demonstration. Suppliers should refer to the above statement in order to calculate the amount of electricity that they must provide. The same loss adjustment factors are reflected automatically in the settlement system.

10. Where the supply is to be provided over SHEPD's electricity distribution system on either an intermittent or continuing basis to any premises with own generation, charges for use of the system will be levied with respect to the system capacity provided to meet the maximum power required as requested by the party seeking use of the system and the extent to which that supply is taken up.

11. Where SHEPD, after evaluation of the characteristics of the requested use of the system, accepts that none of the categories of charges in the schedules of our Licence Condition 4A Statement is appropriate, SHEPD will offer appropriate arrangements in these exceptional circumstances and following discussion with the customer. In most cases, SHEPD will make its offer of terms within 28 days of receiving the application, following receipt of the full and final information necessary for the preparation of the terms.

12.Where use of the system is sought at a standard of security different from that referred to in the Distribution Code, SHEPD may consider special arrangements with respect to that supply. In respect of loads with power factors which fall outside the range of 0.8 lagging and unity, any specific conditions related to the power factor will be stated in the Connection Agreement.

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13.Use of System Charges for demand only include a contribution to recovery of transmission exit charges. These amounts are calculated to be appropriate to each class of customer. This is on the basis that the total contribution to transmission exit charges paid by any class of customer is in proportion to the demand of that class of customer and is generally recovered through the unit charges.

14. Charges to generators for use of SHEPD's distribution system will be made both in respect of electricity that the generator imports from and exports to the system. The generator will be charged for use of the system in respect of such imports or exports in accordance with paragraphs 1 to 13 above and the detail provided in the following sections. The Loss Adjustment Factors set out in our Licence Condition 4A Statement may also be relevant.

15. Embedded Distribution Networks

15.1 Where a connection is provided to an LDNO licensed distribution network embedded within the SHEPD network, the level of demand recorded at the connection point between the SHEPD network and the LDNO network may take a period of time to materialise to the extent of the maximum available capacity stated in the Connection Agreement between SHEPD and the LDNO (the "Maximum Capacity").

15.2 Where capacity charges are applicable to such an LDNO network connection, the availability charge shall initially be based on the recorded demand in the month or the highest recorded demand in any previous month since energisation of the connection, whichever is the higher value.

15.3 SHEPD will review the level of the Maximum Capacity in conjunction with the LDNO and this review will take place three years from the date of energisation of the connection for the licensed embedded distribution network.

15.4 If, during this review, the LDNO chooses to relinquish any proportion of the Maximum Capacity, the released capacity will be made available for use by SHEPD's other customers and the Maximum Capacity in the Connection Agreement will be reduced to match the LDNO's required capacity level.

15.5 Following this review, the availability charge will equal the applicable Maximum Capacity in the Connection Agreement, with effect from the month following the review.

15.6 If, at any time prior to or following this review, the LDNO should require to increase the Maximum Capacity, the LDNO should apply to SHEPD in the manner described in SHEPD's Statement of Charging Methodology for Connection.

Tthe following numbered paragraphs relate to the transport of electricity on SHEPD's system by Authorised Electricity Operators to or from exit points from the system, and to the transport of electricity on the system for supply to Authorised Electricity Operators and to generators including customers with on-site generation.

1. Where a supply of electricity is provided over electric lines or electrical plant comprising a part of SHEPD's electricity distribution system, a charge for use of the system will be levied either on the Supplier of the electricity or the LDNO. The relevant charges are described in our Licence Condition 14 Statement and are payable by reference to the characteristics of the supply, in accordance with the categories of supply described in the section headed 'Notes on Use of System Tariffs'.

2. The charges for each category of supply depend upon the criteria that determine eligibility for that category, including the voltage of connection to the system, the characteristics of the load, and installation of the appropriate use of system metering.

3. The charges for use of the system reflect:

- the costs of providing, operating and maintaining the electricity distribution system to the standards prescribed by the Act other than those costs which are recovered through charges paid to SHEPD in respect of connection to the system, such that electricity can be transported efficiently through the system to exit points or from entry points; and

- the costs to SHEPD of providing services and performing functions for Authorised Electricity Operators, on terms that SHEPD is under a duty to offer under its licence, in order to support the operations of a fully competitive supply market. These services include: Meter provision services; Metering Point Administration Services; Energisation and De-energisation and Re-energisation services; Revenue Protection Services; and Radio Teleswitch Services. SHEPD is either wholly or partly remunerated through use of system charges or through transaction charges for these services.

4. The charges for provision of these services are detailed in the relevant SHEPD charging statement.

5. All charges for use of the system include a reasonable return on the relevant assets, and the revenues arising from the charges are subject to price regulation in accordance with the terms of the licence.

6. Charges to Suppliers and LDNOs for the use of the system are evaluated as if from a SHEPD Grid Supply Point. These charges reflect real electrical flows on the system and the need to provide adequate capacity at all voltage levels to protect the security of the system. Paragraph 10 may also be relevant. Charges are applied to the electricity as measured at the exit or entry points, as indicated in paragraph 7 below.

7. The charges for use of the system may include some or all of the following elements:

- one or more unit charges;

- a fixed,daily or monthly -charge;

- a capacity charge;

- a reactive power charge; and

- **transactional charges** for certain services provided by SHEPD on an individual basis to Licensed Suppliers. Details are given in our Licence Condition 14 Statement.

8. The charges for use of system exclude charges for the provision of distributor metering and data services in SHEPD's distribution services area. The terms and conditions for the provision of non half-hourly distributor metering and data services are detailed in a separate statement.

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9. Full details of our metering charges are available in our document titled, 'Statement of Charges for Southern Electric Power Distribution plc's Distributor Metering and Data Services. This statement can be obtained from our web-site, www.ssepd.co.uk, or is available on request at a cost of £5 by following up the contact details on page 6.

10. Authorised persons seeking use of the system shall procure that the Meter Operator, Data Collector and Data Aggregator appointed for each metering point supplied in relation to which the supply of electricity is measured by the metering equipment for the purposes of Settlement, shall provide SHEPD with any data required to be provided to SHEPD, without charge, by the person appointed in that capacity under, as appropriate, the Distributor Metering and Data Services Agreement, Data Collection Services Agreement or Data Aggregation Services Agreement in accordance with the timescales specified in such agreements. Whether SHEPD is appointed to carry out this task or the supplier installs his own energy metering, SHEPD reserves the right to install use of system metering equipment and apply an additional charge for this equipment.

11. Terms for payment of charges for use of system, any requirement to provide appropriate security to SHEPD in respect of the charges billed but unpaid and/or estimated to arise, and interest payments applicable to late payments shall be in accordance with the terms of the DCUSA. For supplies with complex pricing structures driven by site-specific components, site-specific invoices will be rendered, listing the supplies to which the invoice refers, the information about the supply on which the charge has been calculated, and the amount due for each supply identified in the invoice.

12. Where a supply is to be provided wholly or partly over SHEPD's electricity distribution system to an exit point from that system, the Supplier or embedded Distributor must demonstrate that at all times the quantity of electricity entering the system for the purpose of providing that supply equals the metered quantity delivered from that exit point plus the amount of electrical losses appropriate to the voltage at which the supply is delivered and to the source of the supply, as shown in the tables ~~schedule of loss adjustment factors~~ in our Licence Condition 14 Statement. Relevant metering information or being a party to the Balancing and Settlement Code will be considered to be adequate demonstration. Suppliers should refer to the tables~~above statement in order~~ to calculate the amount of electricity that they must provide. The same loss adjustment factors are reflected automatically in the settlement system.

13. Where the supply is to be provided over SHEPD's electricity distribution system on either an intermittent or continuing basis to any premises with own generation, charges for use of the system will be levied with respect to the system capacity provided to meet the maximum power required as requested by the party seeking use of the system and the extent to which that supply is taken up.

14. Where SHEPD, after evaluation of the characteristics of the requested use of the system, accepts that none of the categories of charges in the schedules of our Licence Condition 14 Statement is appropriate or where supplies are to be provided at Extra High Voltage (EHV), as defined in the our Licence Condition 14 Statement, SHEPD will offer appropriate arrangements in these exceptional circumstances and following discussion with the customer. In most cases, SHEPD will make its offer of terms within 28 days of receiving the application, following receipt of the full and final information necessary for the preparation of the terms.

15. Where use of the system is sought at a standard of security different from that referred to in the Distribution Code, SHEPD may consider special arrangements with respect to that supply. In respect of loads with power factors which fall outside the range of 0.8 lagging and unity, any specific conditions related to the power factor will be stated in the Connection Agreement.

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16. Use of System Charges for demand only include a contribution to recovery of transmission exit charges. These amounts are calculated to be appropriate to each class of customer. This is on the basis that the total contribution to transmission exit charges paid by any class of customer is in proportion to the demand of that class of customer and is generally recovered through the unit charges. For EHV customers, transmission exit charges may be recovered through the capacity related charge.

17. Charges or credits to generators for use of SHEPD's distribution system may be made in respect of electricity that the generator imports from and exports to the system. The generator will be charged for use of the system in respect of such imports or exports in accordance with paragraphs 1 to 13 above and the detail provided in the following sections.The Loss Adjustment Factors set out in our Licence Condition 14 Statement may also be relevant.

18. Embedded Distribution Networks

18.1 Where a connection is provided to an LDNO licensed distribution network embedded within the SHEPD network, the level of demand recorded at the connection point between the SHEPD network and the LDNO network may take a period of time to materialise to the extent of the maximum available capacity stated in the Connection Agreement between SHEPD and the LDNO (the "Maximum Capacity").

18.2 Where capacity charges are applicable to such an LDNO network connected at EHVion, the availability charge shall initially be based on the recorded demand in the month or the highest recorded demand in any previous month since energisation of the connection, whichever is the higher value.

18.3 SHEPD will review the level of the Maximum Capacity in conjunction with the LDNO and this review will take place three years from the date of energisation of the connection for the licensed embedded distribution network.

18.4 If, during this review, the LDNO chooses to relinquish any proportion of the Maximum Capacity, the released capacity will be made available for use by SHEPD's other customers and the Maximum Capacity in the Connection Agreement will be reduced to match the LDNO's required capacity level.

18.5 Following this review, the availability charge referred to in paragraph 18.2 will equal the applicable Maximum Capacity in the Connection Agreement, with effect from the month following the review.

18.6 If, at any time prior to or following this review, the LDNO should require to increase the Maximum Capacity, the LDNO should apply to SHEPD in the manner described in SHEPD's Statement of Charging Methodology for Connection.

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PART A – Use of System Methodology – Regulated HV and LV Tariffs covered by the Common Distribution Charging Methodology (CDCM)

Charges for HV and LV connected demand, generation and licenced embedded distribution networks are set in accordance with the Common Distribution Charging Methodology (CDCM).

The CDCM is available from our web-site at:
www.ssepd.co.uk

Further background information on the CDCM is also available from Energy Networks Association (ENA) at :
http://2009.energynetworks.org/structure-of-charges/

PART B1 – Use of System Methodology – EHV & HV Site-specific Demand

The following section describes the use of system charging methodology used to determine EHV and some legacy HV connected users that are not covered by the Common Distribution Charging Methodology (CDCM).

To set these charges, the methodology used prior to 1 April 2010 is applied. Whilst the methodology produces charges for all voltage levels, only the EHV and legacy HV site-specific tariffs are used.

~~**Use of System Methodology – Regulated Demand Tariffs**~~

Principles

The methodology to calculate use of system charges involves the following process:

- Yardstick Calculation;
- Revenue Calculation;
- Setting Final Tariffs.

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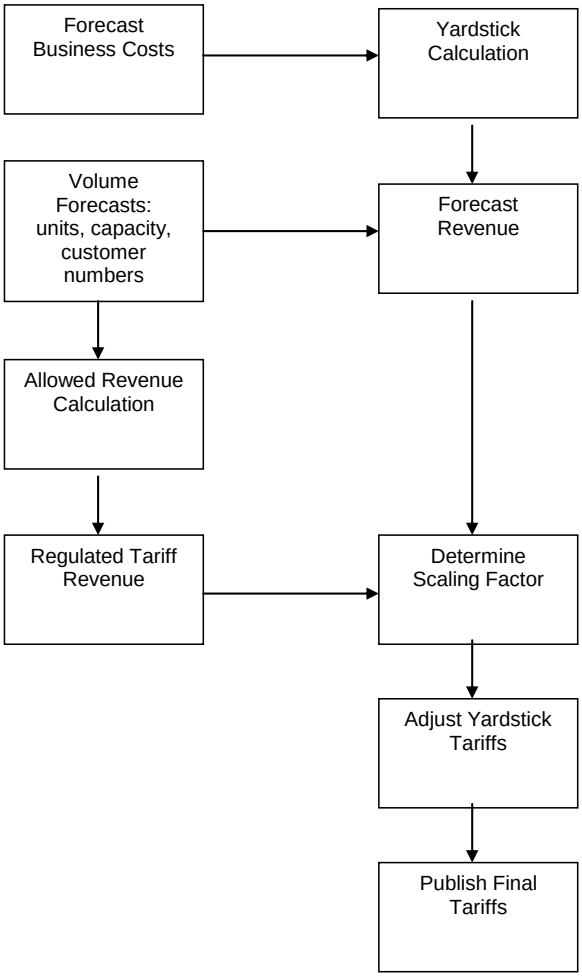
The process produces use of system charges that maintain appropriate cost recovery between customer groups, provide price stability, cost reflectivity and ensure that target allowed revenue is achieved.

The stages in the process are described in the following sections, and depicted in Fig 1: High level flowchart of the process, on the following page.

Fig 1: High Level flowchart of the process



Yardstick Calculation

The use of system yardstick tariff costs are derived by calculating costs based on a modern replacement value simulation of the distribution netork, with the asset value at each distribution voltage being calculated.

Costs

Modern equivalent asset prices and trends were used to produce costs at each voltage level. This cost was then converted into an annual charge by means of an annuity factor, which included a target rate of return and an allowance for obsolescence. The annuitisation factor used was based on the allowed rate of return over the assumed lifetime of the asset. In addition to annuitised capital costs, the yardstick model also builds in annualised operation ands maintenance costs.

Each year, the simulation is updated to reflect the addition and removal of assets at each voltage level. Historical capital expenditure and operating cost figures are revised and new forecasts incorporated.

All of the cost inputs to the simulation are gathered into two groups: customer-related costs and asset-related costs. The asset-related costs are those which are driven by demand on the assets. Customer-related costs are driven by the existence of the customer rather than by the customer's demand on the assets. Together the annuitised capital costs and the annual operation and maintenance costs derive the total £/kW over each voltage level of the system.

Other business costs including local authority rates, corporate overheads, minimum supply connection costs, and billing and collection costs are included in the various yardstick components.

A yardstick tariff is developed for each class of customer. It takes into account the costs at each level of the system from 33kV to LV and over each voltage level. Average diversity factors, load factors and assumed coincidence factors are then utilised to turn the £/kW into a cost reflective yardstick unit rate for the customer class. The allocation of the costs to the customer class is based on annual total demand.

SHETL charges are treated as a pass through cost and recovered across each element of a customer class tariff.

The underlying rationale is to attribute costs in the most cost-reflective manner, consistent with the available metering.

Revenue Calculation

The following process explains the revenue calculations that ~~will~~ need to be performed in order to set the final use of system tariffs. The purpose of this process is to (a) calculate the combined allowed distribution revenue (ie the "single pot"); (b) to calculate the EHV Demand and Generation allowed revenues; (c) to calculate the CDCM Inputs (HV/LV allowed revenue). These calculations also take account of the recovery ('K') positions (which may be +ve or –ve) from 2009/10. The distributed generation 'K' can be treated as a separate calculation only in the transition from DPCR4 into DPCR5 (ie 2009/10 into 2010/11). Thereafter, it is part of the total combined distribution 'K'.

Steps to derive revenue under a single pot

(1) Calculate total allowed revenue pot from price control formula and add the under/over recovery (' K') for Demand and Generation (DG). This is the combined allowed distribution revenue, referred to in (a), above.

(2) Aggregate the ~~Calculate the~~ EHV & HV/LV DG allowed revenues, calculated using the Draft Licence Condition CRC11 formulae~~element of the pot from price control formula~~ and add the 2009/10 under/over recovery ('K')~~-K~~ for DG. This enables dis-aggregation of the DG component of the combined allowed distribution revenue.

(3) ~~Use the EHV DG allowed revenue in step (6)~~

~~(4)~~ Subtract the revenue given by (2) from the total allowed revenue pot (1). This is the total demand allowed distribution revenue (ie HV/LV plus EHV), from which the EHV demand distribution revenue is calculated (4, below)

(4~~5~~) Using the current methodology and the demand allowed distribution revenue calculated in (step 3~~4~~), calculate the EHV Demand charges.

(5~~6~~) Sum the EHV DG allowed revenue calculated in (step 2) with the EHV Demand allowed revenue, from the EHV Demand charges (step 4),~~Use the sum of the numbers from (3) and (5)~~ to populate the table of target revenue in the CDCM, under "revenues recovered outside this model"

~~Allowed Revenue~~

~~The Allowed Revenue is derived from the distribution price control formula set out in the licence. The calculation produces the maximum average allowed revenue per unit distributed. Adjusting for the pass-through of excluded service revenue gives the total use of system revenue that SHEPD is allowed to recover via its tariffs. This is known as the Regulated Tariff Revenue.~~

Setting Final Tariffs

Once the amount of revenue required from the regulated tariffs has been determined, a uniform scaling process is then undertaken across all yardstick tariffs, to ensure that the forecast revenue recovered matches the regulated tariff revenue.

Use of System Charges for EHV Demand Customers

Standard charges for EHV Demand customers will be derived as described above and will comprise of a Fixed charge (£/month), Availability charge (p/kVA/month) and unit rates (p/kWh).

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Format of Tariffs – EHV, HV and LV

Tariff structures relate to the metering installed in the customer's premises, which is driven by the settlements data requirements and can result in restriction of the format of the tariff a distributor may offer.

Those tariffs relating to customers without Maximum Demand metering consist of the following components:

- Customer related or MPAN charge;
- Unit related charge(s)

Those tariffs relating to customers with Maximum Demand metering consist of the following components:

- Customer related or MPAN charge;
- Unit related charge(s);
- Capacity related charge.

The tariffs applicable to various customer groups (e.g. Domestic, Non-domestic) are identified by unique Line Loss Factor Class (LLFC) codes.

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Out of Area Networks

Where SHEPD operates distribution networks outside its distribution services area, it will charge any demand connecting to those networks after 1 April 2006 in a manner which ensures that the overall UoS charges payable do not exceed those which would be payable if the connection had been made to the network of the "host" distribution network operator in whose distribution services area SHEPD's network is situated.

~~Charges for Licensed IDNO (Including LDNO) Connections~~

~~The use of system charges for Licensed IDNO connections are calculated as a discount from our standard charges as described below:~~

- ~~distinguish between predominantly domestic and predominantly non-domestic developments and, for predominantly non-domestic developments, between "small non-domestic" and "large non-domestic".~~

~~For LV and HV connected predominantly domestic Licensed IDNO sites, the tariffs are determined by applying a percentage discount to a calculated combined unrestricted and day/night all the way domestic tariff. The same percentage discount will apply to the day unit charge, the night unit charge and the fixed charge.~~

~~For LV connected predominantly small non-domestic Licensed IDNO sites, the tariffs are determined by applying a percentage discount to a calculated combined unrestricted and day/night all the way small non-domestic tariff. The same percentage discount will apply to the day unit charge, the night unit charge and the fixed charge.~~

~~For LV connected predominantly large non-domestic Licensed IDNO sites the day and night unit rates are calculated by applying the relevant percentage discount to the all the way tariff for a large LV non-domestic user.~~

~~For EHV Licensed IDNO sites and for HV Licensed IDNO sites with predominantly non-domestic load, normal non-domestic tariffs apply.~~

~~The discount is calculated by using three sources of information:~~

1. ~~The DPCR4 final settlement which gives the split of allowed revenue for the DPCR4 period between operating costs, depreciation and return on regulated asset base.~~
2. ~~07/08 RRP data is used to allocate reported costs across voltage levels and is used to apportion operating costs. Many direct costs are allocated in the RRP data with indirect costs apportioned on the basis of the gross modern equivalent asset value of the network.~~
3. ~~Current DPCR5 forecasts contain forecasts of capital investment split by voltage level. This is used to apportion both depreciation and return.~~

~~The proportion of the allowed revenue that is to be split between SEPD and the Licensed IDNO is then determined by taking the in-year allowed revenue (excluding any k-factor adjustments) and excluding incentive revenue and the pension deficit payment allowance. The remaining allowed revenue is split across voltage levels using the percentages derived from the data detailed above and this revenue is converted to a p/kWh figure at each voltage level. The proportion of the overall price that is attributable to the LV system is then allocated between SEPD and the Licensed IDNO. This split represents the proportion of the LV network that, on average, LV embedded networks use in respect of each end user, relative to the amount of LV network used by SEPD end users. This is used to reduce the direct proportion of the LV allocation. The entire indirect cost element is attributed to the Licensed IDNO. For the predominantly domestic HV tariff the above method used also includes the costs apportioned to the HV/LV substation.~~

PART B2 – Use of System Methodology – EHV Generation

~~**Use of System Methodology – Generation Tariffs**~~

Introduction

Generators who connect to the distribution system based on terms offered in compliance with the methodology set out in SHEPD's connection charging methodology statement will, where applicable, be required to pay generator distribution use of system (GDUoS) charges, as discussed in this section. These charges apply to the characteristics of the generator's export to the distribution system. Where the generator also imports energy from the distribution system, the appropriate demand tariffs will apply.

Rationale

Ofgem, in DPCR4, introduced ~~have proposed~~ a ~~-~~mechanism to incentivise SHEPD in the efficient connection of~~to connect~~ generators to its distribution network. The mechanism allows SHEPD to recover a percentage of the reinforcement costs associated with the connection of generation, a value per kW of generation connected and an allowance per kW for the operation and maintenance of the assets used to connect generation. The approach involve~~d~~s the development of a ~~distributed~~ Distributed ~~generation~~ Generation (DG) allowed revenue income stream.

Charging arrangements for EHV generators connected prior to 1 April 2005 are subject to appropriate charging arrangements being developed through industry collaboration. Until this is developed, no charges will apply to these generators.

If a generator connected prior 1 April 2005 makes a significant alteration to their export requirement (due to, for example, increased export capacity) the incremental increase in export capacity will be charged generator use of system on the same basis as post 1 April 2005 generators.

~~Pre April 2005 generators to date have been exempt from GDUoS. Ofgem have removed the blanket exemption from 1 April 2010 and the charging methodology described below should not unduly discriminate between pre and post April 2005 generators.~~

This methodology statement explains the calculation of SHEPD's Interim EHV GDUoS charges for 2010-11.

~~**Transitional Arrangements**~~

~~Generators already connected to the distribution system will not be liable for any GDUoS charges unless there are material changes in their required export capacity and/or connection arrangements after 1 April 2005. Similarly, generators who have accepted a connection offer based on the connection charging methodology applicable prior to 1 April 2005 will be connected according to the agreed contractual arrangements and will not be liable for GDUoS charges. Due to the 90-day timescale for providing connection quotations, the last application date for which a connection offer based on the previous methodology can be guaranteed is 31 December 2004.~~

~~Generators applying for connection after 1 April 2005 will be liable for GDUoS. Since generators applying for connection on or after 1 January 2005 are likely to be provided with terms for connection on or after 1 April 2005, the new connection charging methodology will be used in providing these terms. These generators will then be liable for GDUoS once connected.~~

Methodology

The methodology used to establish EHV GDUoS has ~~is expected to~~ evolved during DPCR4 ~~over time~~ as ~~further~~ experience has been ~~is~~ gained of the capacities of generators connecting and the costs of reinforcing the distribution system to accommodate them. This section deals specifically with the ~~Initially, two categories of~~ capacity-related charges associated with EHV connected generation, which are used to ~~have been developed (one for EHV and one for HV/LV) by~~ build~~ing~~ up the elements of the EHV DG allowed revenue income stream.

The EHV DG allowed revenue is the sum of 7 elements. These are:-

1. The incentive allowance. This is the allowance applied to the relevant MW of EHV DG capacity (MW) and is £1/kW..
2. The operation and maintenance allowance. This allowance is applied to each MW of relevant EHV DG capacity and is £1/kW.
3. The DG capex pass through revenue. This is an allowance for the pass through of Use of System Capex for DG, based upon a pass-through rate of 80%, over 15 years. In the EHV GDUOS Tariff Setting Examples, below, this pass through is referred to as the "Network Charge", expressed in £/kW.
4. The Registered Power Zone (RPZ) allowance. This is an additional allowance applied to relevant DG MW connected in an RPZ Area and is £3.45/kW.
5. The previous price control (DPCR4) amount. This is an annual allowance in respect of relevant DG connected in the DPCR4 period, and has been set at £0.5m per annum for SHEPD.
6. The values in respect of an Inset Electricity Distributor. These are amounts calculated for the 5 allowances above, and at the same rates, applied to relevant DG connected within an Inset Electricity Distributor's network within the SHEPD Licensed DNO Area.
7. The DG Recovery ('K') adjustment for the previous financial year.

Some elements of allowed income are already expressed in £/kW terms. In order to express the allowed pass-through of reinforcement costs (the DG Capex pass-through) for EHV Generation~~the above two categories~~ in similar terms, forecasts and assumptions are made about the level of reinforcement costs, the contribution to those costs made by generators through their connection charge and any other factors affecting the EHV DG allowed revenue income stream. The resulting costs are then annuitised to provide an equivalent £/kW figure, referred to as the network charge.

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~~The Incentive Allowance Rates designated in the DPCR5 Final Proposals will be applied to the relevant EHV capacity (kW). Currently these have been modelled as £2/KW), applied to generators connected between 1st April 2005 and 31st March 2010, and £1/kW applied to those generators connecting after 31st March 2010.~~

EHV Generation Tariff Setting Example

The following example illustrates the charge setting process- described above.

Expected DG Capacity (MW) (A)	Expected RPZ MW included in (A)	Expected Pass-through costs £m (B)	Cost per kW (B) / (A) £/kW
800	3	8	10

Annuity Factor	0.1091	Price control assumption, reflecting 6.9% rate of return over 15 years
Network Charge £/kW	1.1	£10/kW x 0.1091
Operation and Maintenance Charge £/kW	1.0	~~Price control allowance~~
£/kW Incentive Allowance	12.0	~~Price control allowance~~
RPZ Allowance £/kW	0.010.2	
Inset Electricity Distributor Allowances £/kW	0.00	
Previous Price Control Allowance £/kW	0.63	
Total Charge £/kW	**3.7443..3**	

In the above example, the Incentive Allowance Rate (£12/KW) is applied to generators connectinged after ~~between 1st April 2005 and~~ 31st March 2010. ~~For those relevant generators connected between 1 April 2005 and 31 March 2010.the Incentive Allowance Rate is £2/KW.~~

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~~The DG incentive allowance rates designated in the DPCR5 Final Proposals will be applied to the relevant EHV capacity. These have been modelled as £2/kW (SHEPD) and £0/kW (SEPD), applied to generators conencted between 1 April 2005 and 31st March 2010, and £1/kW (SHEPD and SEPD) applied to those generators connecting after 31 March 2010. An operation and maintenance allowance of £1/kW per annum are applied to the Relevant DG capacity (kW).~~ These DG Incentive values and ~~the O&M~~ allowances are inflated by the price adjuster index (PIAGt) and ~~, and~~ added to the aggregate network charge~~asset annuity charge~~.

The total charge derived above is then uplifted to reflect forecast incidence of generation connection during the year such that allowed annual revenue is still achieved.

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T~~It is intended to apply t~~his charge setting process will apply to ~~to~~ generation connecting at ~~both~~ EHV ~~and HV/LV~~ voltages on a £/kVA basis to the export capacity specified in the generator's connection agreement. ~~At this stage, the methodology does not provide charges for generation connecting at non-half hourly metered sites due to the low materiality of expected costs from this class of generator. The charging methodology may be refined in future to incorporate charges for such generators and/or to set different GDUoS charges in different geographical areas.~~

PART B2 – Use of System Methodology – EHV Generation (alternative)

Development of Charges over time

SHEPD will set charges based in the above manner based on the forecasts of generation connecting, the associated costs and the final price control parameters relevant to the calculation of DG allowed revenue. The charges for subsequent years will be updated to reflect: inflation-linked changes to the price control parameters; updated forecasts of generation connecting together with its associated costs; and any under or over-recovery of allowed revenue in the previous year. In the interests of maintaining a stable path of GDUoS charges, SHEPD will limit any year on year increase in generator charges to 10% in real terms.

Other Matters

- Payment Period for GDUoS Charges. A connection start date will be established with each generator to reflect the date from which access to the distribution system is required to be available. GDUoS charges will be payable for the agreed capacity level from the connection start date~~. GDUoS charges at the prevailing rate will be payable for 5 years~~.

- Network ~~Access~~ Unavailability Rebate~~s~~ Payments.

  For EHV generators SHEPD will rebate GDUoS charges as described in the CDCM in Part 3 - Network Unavailability Rebate Payments.

~~For EHV generators who SHEPD will rebate GDUoS charges by £2/MWh of eligible network unavailability in situations where an agreed baseline level of expected network unavailability is exceeded in any financial year. This baseline level will be established on a site-specific basis and will take into account the specific relevant features of the connection arrangements. Pre-arranged outages will not be subject to this rebate mechanism.~~

~~After the end of the financial year, SHEPD will arrange for the appropriate payment to be made to the party liable for the GDUoS payments on the basis of the number of complete hours of network unavailability above the site-specific baseline level that occurred during that financial year.~~

- Out of Area Networks. Where SHEPD operates distribution networks outside its distribution services area, it will charge any generators connecting to those networks after 1 April 2005 in a manner which ensures that the overall GDUoS charges paid by the generator do not exceed those to which it would be liable if it connected to the network of the "host" distribution network operator in whose distribution services area SHEPD's network is situated.

Nested Distribution Systems in Out of Area Networks

Where SHEPD operates distribution networks outside its distribution services area, it will charge any nested networks in a manner which ensures that the overall UoS charges payable do not exceed those which would be payable if the connection had been made to the network of the "host" distribution network operator in whose distribution services area SHEPD's network is situated.

Where our Use of System charges are published

SHEPD's Use of System tariffs are published in our Licence Condition 14 Statement. . This statement can be obtained from our web-site at:
www.ssepd.co.uk
and is also available on request at a cost of £5 by following up the contact details on page 7.

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Where our Use of System charges are published

SHEPD's Use of System tariffs are published in our Licence Condition 4A Statement. This statement can be obtained from our web-site at:

www.scottish-southern.co.uk/ssegroup/contractmanagement.asp

and is also available on request at a cost of £5 by following up the contact details on page 7.

Glossary of Terms

Act	The Electricity Act 1989 as amended by the Utilities Act 2000 and the Sustainable Energy Act 2003.
Authorised Electricity Operator	Persons entitled to use SEPD's distribution system are those who are authorised by licence or by exemption under the Act to supply, distribute or generate electricity.
Authority	The Gas and Electricity Markets Authority (GEMA) – the regulatory body for the gas and electricity industries established under the Section 1 of the Utilities Act 2000.
BSC	Balancing and Settlements Code governing wholesale electricity trading arrangements introduced in England and Wales in 2001.
CUSC	NGC's Connection and Use of System Code
CVA	Central Volume Allocation – centrally registered metering point with no MPAN allocated and not registered in MPRS.
DG	Distributed Generation
Distribution Code, D Code	The Distribution Code of the Licensed Distribution Network Operators (DNOs) of Great Britain; produced in accordance with Condition 9 of the licence and approved by the Authority to define the technical aspects and planning criteria of the working relationship between the DNO and all those connected to its distribution system.
EHV	Extra High Voltage – 22,000 volts or higher voltage.
GDUoS	Generation Distribution Use of System
GEMA	See "the Authority"
HV	High voltage – 6,600 volts or 11,000 volts plus or minus 6% measured between any two-phase conductors.
kVA	Kilo-volt Ampere – a unit of capacity

LDNO	a distribution network operator authorised by a licence granted under the Act to undertake the distribution of electricity and shall include an IDNO Party as defined in the DCUSA
Licence	The Electricity Distribution Licence granted to SEPD under Section 6(1)(c) of the Act.
Licensed IDNO	An independent distribution network operator authorised by a licence granted under the Act to undertake the distribution of electricity and shall include an IDNO Party as defined in the DCUSA
LLFCs	Line Loss Factor Classes
LV	Low voltage – 230 volts plus 10% or minus 6% measured between the neutral conductor and any two-phase conductor.
MPAN	Meter Point Administration Number
MPRS	Meter Point Registration Service
MRA	Master Registration Agreement –The MRA is the multi-party agreement that all Ofgem licensed Suppliers and Distribution Business enter into that governs the essential interactions between them.
NGC	National Grid Company which owns and operates the high-voltage electricity transmission network in England and Wales.
Ofgem	The Office of Gas and Electricity Markets.
RPZ	Registered Power Zones
SEPD	Southern Electric Power Distribution plc
SVA	Supplier Volume Allocation – relates to units that enter settlements from an MPAN registered in MPRS

~~Act~~

Authorised Electricity Operator	Persons entitled to use SHEPD's distribution system are those who are authorised by licence or by exemption under the Act to supply, distribute or generate electricity.
Authority	The Gas and Electricity Markets Authority (GEMA) – the regulatory body for the gas and electricity industries established under the Section 1 of the Utilities Act 2000.
BETTA	British Electricity Transmission and Trading Arrangements, due to come into force on 1 April 2005
BSC	Balancing and Settlements Code governing wholesale electricity trading arrangements introduced in England and Wales in 2001.
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CVA	Central Volume Allocation – centrally registered metering point with no MPAN allocated and not registered in MPRS.
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EHV	Extra High Voltage – 22,000 volts or higher voltage up to and including 33,000 volts
GDUoS	Generation Distribution Use of System
GEMA	See "Authority"
HV	High voltage – 6,600 volts or 11,000 volts plus or minus 6% measured between any two-phase conductors.

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LLFCs	Line Loss Factor Classes
LV	Low voltage – 230 volts plus 10% or minus 6% measured between the neutral conductor and any two-phase conductor.
MD	Maximum Demand
MPAN	Meter Point Administration Number
MPRS	Meter Point Registration Service
MRA	Master Registration Agreement – The MRA is the multi-party agreement that all Ofgem licensed Suppliers and Distribution Business enter into that governs the essential interactions between them.
NGC	National Grid Company which owns and operates the high-voltage electricity transmission network in England and Wales.
Ofgem	The Office of Gas and Electricity Markets.
RPZ	Registered Power Zones
SHEPD	Scottish Hydro Electric Power Distribution plc
SVA	Supplier Volume Allocation – relates to units that enter settlements from an MPAN registered in MPRS

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Licence	The Electricity Distribution Licence granted to SEPD under Section 6(1)(c) of the Act.
Licensed IDNO	An independent distribution network operator authorised by a licence granted under the Act to undertake the distribution of electricity and shall include an IDNO Party as defined in the DCUSA
LLFCs	Line Loss Factor Classes
LV	Low voltage – 230 volts plus 10% or minus 6% measured between the neutral conductor and any two-phase conductor.
MPAN	Meter Point Administration Number
MPRS	Meter Point Registration Service
MRA	Master Registration Agreement –The MRA is the multi-party agreement that all Ofgem licensed Suppliers and Distribution Business enter into that governs the essential interactions between them.
NGC	National Grid Company which owns and operates the high-voltage electricity transmission network in England and Wales.
Ofgem	The Office of Gas and Electricity Markets.
Relevant DG	Means Distributed Generation (except for standby generation operating in parallel with SHEPD's Distribution System for testing purposes only) which has a connection start date on or after 1 April 2010 and is eligible for Use of System Charges.

RPZ	Registered Power Zones
SHEPD	Scottish Hydro Electric Power Distribution plc
SVA	Supplier Volume Allocation – relates to units that enter settlements from an MPAN registered in MPRS

Appendix 1 – Losses methodology

Statement of Loss Adjustment Factor Methodology for Scottish Hydro Electric Power Distribution plc Electricity Distribution Network

1. General Information

1.1. This appendix describes the methodologies applied by Scottish Hydro Electric Power Distribution plc (SHEPD) in the calculation of its Loss Adjustment Factors (LAFs) for authorised users of its distribution network in 2009/10.

1.2. SHEPD is providing this statement as an appendix to the Use of System Charging Methodology. It details the methodology that is used for the calculation of its published loss adjustment factors and is made available in order to provide clarity and transparency for users of its distribution network. The statement is in addition to the Use of System Charging Methodology statement and is not subject to approval by the Authority.

1.3. SHEPD is obliged under Standard Condition 14 of the Distribution Licence to publish a statement of charges for the use of the distribution system that is in a form approved by the Authority. The statement is required to contain "a schedule of adjustment factors to be made for distribution losses" in the company's Condition 14 statement. SHEPD's loss adjustment factors are made available to Elexon (and therefore all market participants) through the provision of the dataflow, D0265 for SVA loss adjustment factors and an Elexon prescribed data format for CVA loss adjustment factors. All loss adjustment factors are calculated to an accuracy of 3 decimal places (BSCP128 Principle 2) and in accordance with the following Seasonal Time of Day (SToD) time periods (BSCP128 Principle 8).

Time Periods	
Winter Peak	1600–1900, Monday – Friday during the months of November, December, January and February
Winter Weekday	0730–1600 & 1900-2000 Monday – Friday during the months of November, December, January and February
Night	0030 – 0730, Every night of the year
Other	Any other time not specified above

1.4. Loss adjustment factors are determined through the application of two methodologies. The generic (or mass market) loss adjustment factors are calculated using a methodology similar to that developed by EA Technology, in conjunction with ourselves and the majority of distribution businesses. This methodology has been built into our "General System Losses model". This process produces averaged loss adjustment factors for use with all customers connected at LV and HV voltage levels and temporarily for new customer sites connected at Extra High Voltage (EHV) until a site specific LAF is calculated.

1.5. Site specific loss adjustment factors are calculated for those sites connected at EHV and where DNO agree to apply Site Specific calculation following a Customer's particular request (BSCP128 Principle 1) using an electricity industry methodology employing specific load flow models developed for each individual site. The treatment of both demand and generation sites within these models follows the substitution method. This is described for generation in accordance with industry guidance documents issued by the Settlement Subcommittee Operations (SSC(OP)). In particular the following documents, SSC(OP) 1390 (Revised), "Guidance note for the calculation of loss factors for embedded generators in settlement" (1992) and the sub group report MDC/54/1166 (1995) refer.

2. Generic LAFs

2.1. Generic factors are calculated for all SVA (non EHV) registered authorised users for the predetermined SToD time periods of the year. The allocation methodology and software model (program newLAF), similar to that developed by EA Technology, is utilised to calculate the generic loss adjustment factors. The generic LAFs are recalculated and published at least every 2 years (BSCP128 Principle 12) at the following 5 exit point voltage levels (BSCP128 Principle 7):

2.2. The LLFC Groups for which generic LAFs are calculated in SHEPD are listed below and are consistent with Principle 7 of BSCP128:

- 33 kV Extra High Voltage (Generic EHV33)
- 11kV provided at the terminals of a 33kV substation (HVS)
- High Voltage (HV) (11kV)
- Low voltage provided at the terminals of a HV/LV substation (LVS)
- Low voltage (LV)

2.3. Customer's import or export supply connected at LV, HV or EHV at the same site and at the same voltage level shall have the same values (BSCP128 Principle 6).

2.4. The overall process of estimating LAFs is as follows: A forecast is made of the demand in terms of units entering the system from known purchases at GSPs and from embedded generation and the units leaving the system, based upon known unit sales. The total system losses therefore take into account both technical and non-technical (BSCP128 Principle 4) losses and are given by the following expression.

Total System Losses = Units Entering System - Units Leaving System

2.5. The forecast is based on smoothing historic data from the settlement system allowing for weather corrections and unexplained fluctuations in the settlement data and extrapolating or interpolating to take into account the changed level of demand. Forecasts are also made of the metered volume of energy to be supplied by embedded generation at each voltage level. The remaining units to balance the demand + losses - embedded generation define the units supplied from the transmission system at the GSPs.

2.6. In detail the three voltage levels of 33kV, 11kV and LV and the two transformation levels of 33/11kV and 11kV/LV are represented within a network model. The model is populated with the set of standing data. For example, the fixed loss constant (megawatts) and the variable loss constant (megawatts per megawatt squared) for each voltage and transformation level are contained within the standing data.

2.7. The model is also populated with the metered volumes of energy per annum at the various network voltages. Energy metered profiles are included at the connection points with National Grid Company and for site specific demand and generation. Common profiles for demand and generation (net demand) are supplied for each of the HV/LV LLFC groups (HVS, HV, LVS). The LV profile is determined by subsequent calculation. The data enables accurate LAFs to be calculated for the predetermined SToD time periods of the year.

2.8. A 'Top-Down' approach is used for estimating network losses starting from the 33kV bar at GSPs. The energy delivered from the higher voltage level is used to deduce the losses on the assets and thus the energy passed through to the lower voltage level.

2.9. The model calculates for each half-hour in the year the energy passed through the network into the next voltage level below using the following empirical equation

$$P_{out} = P_{in} - v.P_{in}^{2} - f - L + G$$

2.10. where Pin = Power into voltage level from higher voltage level, Pout = Power out of voltage level into lower voltage level, f = Fixed loss constant for voltage level, v = Variable loss constant for voltage level, L = Metered sales at voltage level, G = Metered generation at voltage level.

2.11. This is illustrated by the following example which is carried out for each half-hour:

	Units of power are average MW for each half-hour					
	import	LAF	Losses	Residual demand	Residual losses	Generic LAF
BSP import	1000	1.000		1000	0	**1.000000**
BSP generation	100	1		1100	0	
33kV fixed losses			0.2	1099.8	0.2	
33kV variable losses			9.8	1090	10	
33kV site specific generation	300	1.02		1390	16	
33kV site specific demand	-200	1.012		1190	13.6	
33kV network generic LAF				1190	13.6	**1.01143**
33kV/HV fixed losses			5	1185	18.6	
33kV/HV variable losses			15	1170	33.6	
33kV/HV site specific demand	-50	1.025		1120	32.35	
33kV/HV generic LAF				1120	32.35	**1.02888**

2.12. The above illustrates how losses caused by site-specific customers are incorporated: Aggregated data from all Site Specific SVA and CVA sites and weighted Site Specific LAFs at each voltage level are entered into the model. The model then calculates the specific generic losses associated with these groups of Site-Specific sites along with the losses for the other generic LLFC groups (BSCP128 Principle 5). This process is repeated through the voltage and transformation levels until the LV network is reached. The half-hourly metered load for that half-hour is then subtracted to leave the estimated demand for that half-hour attributed to the quarterly metered customers. This is not known for each individual half-hour. Therefore the total estimated quarterly metered demand for the year is compared with that used in producing the estimate of the Units Leaving System. There will always be at least a very small discrepancy in these two figures due to assumptions in the model (BSCP128 Principle 4) and variations in LV metered data accuracy, e.g. time registration unmetered supplies, theft etc. This discrepancy represents unapportioned electrical losses and is thus reapportioned iteratively across all voltage levels by the model itself to match the two values. The model achieves this by adjusting the variable losses via the variable loss constants. Since estimates of fixed losses and of variable loss constants at EHV are more robust than the estimates of the variable loss constants at lower voltages the adjustments are weighted towards the variable loss constants at the lower voltages.

2.13. At this stage the model also apportions losses in the system at each voltage level to each electrical unit of energy flowing through that level.

2.14. The output is a generic LAF for each half-hour at each voltage level. This is identical for import and export.

2.15. The LAF for a predefined time period, at each voltage level, is calculated as the average weighted value for that time period. For the HVS, HV, LVS these are based on the profiles supplied for the net demand at each level.

2.16. A customer's import or export supply is thus allocated LAFs dependent upon their point of connection with the network in relation to the 5 exit points identified.

3. Site Specific LAFs

3.1. Site specific LAFs are calculated for all CVA and EHV SVA registered authorised users on an individual basis. Each customer's supply is modelled individually using a model representation of the distribution network that contains details of the customers load profile, the system load profile and the specific DNO assets used to supply them. They are recalculated when there has been a relevant change (as defined in BSCP 128) to the site or network, and at least every 5 years (BSCP128 Principle 13).

3.2. The site specific LAF comprises a fixed loss element and a variable loss element. Losses are calculated for the four periods of the year similar to the system losses, taking into account real current flows and asset sharing. They therefore account for technical losses only (BSCP128 Principle 3).

3.3. Significant changes year to year are much more likely to occur when losses are calculated on a site-specific basis. Changes in demand or consumption on one site can cause significant changes to the losses incurred due to that particular customer's connection. Such changes are not swamped by the overall inertia of the entire network and consequently site-specific losses are more volatile. However such significant changes are the exception rather than the rule as customers' overall demands and consumptions tend to remain fairly consistent (allowing for seasonal variations) given no major site or economic changes.

3.4. Site specific LAFs are calculated for both load and generation customers using the substitution method.

4. Substitution method

4.1. Load flow and energy loss calculations are carried out with the customer connected and then disconnected from the network in the 4 time periods as specified. The change in losses is attributed to the customer.

4.2. A load flow approach is used for calculating network losses on all assets employed to service each customer, from the 33kV bar (or other lower voltage where applicable) at the GSP to the users point of metering with the network.

4.3. As a general principle load flow studies calculate a single set of results based upon a single set of network parameters and conditions. Therefore load flow studies are carried out, one for each of the time periods of interest using the customer's maximum demand attained in each period and the network demand corresponding to the time of maximum demand at the supply point within the time period. An adjustment factor of 0.8 is applied to the change in variable losses to make allowance for the customer and the network demand not continuously operating at their maximum values within any given time period and therefore not contributing to losses on a consistent basis.

4.4. Half hour metered profile data is available for these customers from which the customers MD can be readily determined for each of the predetermined SToD time periods from actual or assumed half hourly metered data or assumed profiles. Where the customer maximum demand is less than 200kVA or the customer generation is less than 200kW in any time period, then in order to reduce numerical inaccuracy, values of 200kVA or 200kW are used.

4.5. The network model used to calculate Site Specific losses is based on SHEPD's Long Term Development Statement and uses the best available asset data throughout.

4.6. Fixed and variable losses at transformers are determined using the actual transformer iron and copper loss data derived at commissioning for each transformer supplying the customer. In general using the substitution method the change in fixed losses will be zero except in the case when the customer is the sole user of the asset.

4.7. Variable losses within cables and overhead lines are determined using actual impedances derived from manufacturers' cable data together with the calculated current flows.

4.8. Where assets are only used to supply the customer then 100% of the losses generated by those assets are allocated to the customer.

4.9. Where more than one site specific customer exists locally on the network then the substitution method is carried out similarly with the customers being connected to the losses model in the order of their date of commissioning e.g. For a network containing 2 customers the following calculations are performed

- Total energy loss calculated in absence of both customers (T)
- Total energy loss calculated with customer 1 connected (T1)
- Total energy loss calculated with customer 1 and 2 connected (T2)

Difference in loss attributable to customer 1 = T1 – T (normally -ve for a generator)
Difference in loss attributable to customer 2 = T1 – T2

Where the order of connection is unknown or indeterminate due to historic changes in customers' maximum demand or generation, then the analysis is carried out independently for each customer assuming the demand of other customers is unchanged.

4.10. The LAF is given for demand customers by the ratio: 1 + (the losses attributable to the customer)/(customer demand) calculated as described above for each time period. The LAF is given for generators by the ratio: 1 + (decrease in losses attributable to the customer)/(customer generation).

4.11. LAFs for generation whose output causes an overall reduction in system losses will be >= 1 (generators are assigned a benefit). Generation whose output causes an overall increase in system losses will have LAFs <=1. Demand customers which offset generation losses and provide an overall reduction in losses also would receive a LAF <=1.

5. Revision of Published LAFS, Quality Assurance and Publication of LAFs

5.1. SHEPD makes all reasonable efforts to maintain the consistency and accuracy of LAFs output by the calculation process. Examples of the steps taken, but not limited to, are:

- To calculate Generic LAFs, use of the highest quality data available such as the use of settlement metered half hourly data and reconciliation R2 settlements data or greater and from a complete 12-month period as determined by the Panel (BSCP128 Principle 9),
- Validation of input data by comparison with previous year(s) to identify potential errors, inconsistencies or trends with corrective action taken where appropriate,
- Use of proven models and automated processes wherever practicable to increase consistency and reduce the introduction of errors,
- Thorough documentation of calculations and associated quality assurance processes,
- Validation of calculated LAFs by comparison with previous year(s) to identify potential errors, inconsistencies or trends with corrective action taken where necessary,
- Identification of the main contributory changes in electrical network parameters where LAFs change significantly,
- Adjustment to LAFs, to take into account historic market wide issues noted in the BSC Auditor's latest Report, will be made if instructed by the Panel (BSCP128 Principle 10).

5.2. LAFs production will follow SSE internal procedures and checks (BSCP128 Principle 11). LAFs published through the above process are made available as an annual update and take effect from the 1st April each year. No changes will be made to approved generic LAFs mid year. Where default LLFs have been applied due to an audit failure, these may be updated to the approved LLFs on a prospective basis as determined when the LLFs resubmitted by the LDSO have been approved by the Panel. (BSCP128 Principle 14). Changes to site specific LAFs will only be made mid year if there has been a material change (as defined in BSCP 128) affecting the site and when approved by the Panel (BSCP128 Principle 16). Annual updates will have an effective from

date of 1 April. Where default LLFs have been applied due to an audit failure, these may be updated to the approved LLFs on a prospective basis as determined from time to time by the Panel.

5.3. In addition, retrospective changes shall not be made to approved site specific or generic LAFs other than to correct material manifest errors (BSCP128 Principle 15).

6. Out of Area Networks

6.1. Where SHEPD operates distribution networks outside its distribution services area, the LAFs will mirror the host Distribution Network Operator's figures for the GSP Group in which SSEPD's network is situated.

7. Contact Details

7.1. This statement has been prepared to provide clarity and transparency for users of SHEPD distribution network. If you have any questions about the contents of this statement, please contact the relevant person at the address shown below.

7.2.

Mr Angus Rae
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Scottish Hydro Electric Power Distribution plc

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