A Guide to Balancing Services Use of System (BSUoS) Charging

(Produced by the National Grid Company plc, March 01)

1. Introduction

This note sets out the different elements of the BSUoS charge and how the total charge is allocated to each customer. The note is structured as follows:

- Calculating NGC's daily incentive payment
- External System Operator (SO) Settlement Period BSUoS element
- Internal System Operator (SO) Settlement Period BSUoS element
- Total System Operator (SO) Settlement Period BSUoS charge
- Allocating the total Settlement Period BSUoS charge.

2. Calculating NGC's daily Incentive Payments

The daily external ($IncpayEXT_d$) and internal ($IncpayINT_d$) incentive payment to/from NGC included in the total daily BSUoS charge ($BSUoSTOT_d$) are calculated in a similar manner. For illustration, the external System Operator (SO) incentive payment is calculated as follows:

Calculating the daily Incentivised Balancing Costs (IBC_d)

The daily Incentivised Balancing Cost (IBC_d) is calculated as follows:

$$IBC_d = \sum_{jd} (CSOBM_j + BSCCV_J + NI_J + TL_J) + BSCCA_d - OM_d - RT_d$$

These are the costs that NGC is incentivised to manage and are the basis on which the incentive payment to/from NGC is calculated.

The first four terms are specific to each Settlement Period and summed across all Settlement Periods to give daily values.

$CSOBM_j$ This is the cost incurred by the System Operator in accepting bids and offers in the Balancing Mechanism calculated in accordance with the BSC (T4.9.1).

$BSCCV_j$ These are the Balancing Services Contract Costs that can be allocated to specific Settlement Periods in a Settlement Day. These include:-

Energy contracts (options & utilisation)

Standing Reserve options fees

Regulating Reserve options fees

NI_j The costs associated with the net imbalance volume in each half hour is calculated as the total net imbalance volume multiplied by the net imbalance volume reference price. The reference price will be the System Buy Price (SBP) or System Sell Price (SSP) (dependent on whether the total net imbalance volume is negative or positive).

TL_j The costs associated with transmission losses in each half hour is calculated as the total volume of transmission losses multiplied by a transmission losses reference price (set at £20/MWh indexed).

$BSCCA_d$ These are the Balancing Services Contract Costs that can not be allocated to each Settlement Period in a Settlement Day. These include:-

Black Start capability payments

Reactive capability payments

Reactive utilisation payments

Frequency Response holding cost

Warming contracts

OM_d These are the costs associated with the provision of Balancing Services to others (currently known as Third Party Uplift) which are excluded from the incentive scheme.

RT_d These are the Daily Balancing Services Adjustments which arise from income adjusting events and are agreed with Ofgem.

Calculating the daily incentive payment to/from NGC

- The daily Incentived Balancing Cost (IBC_d) is used to calculate a daily incentive payment against an agreed incentive scheme target, sharing factors, cap and collar.

- A sum is made of all the daily Incentivised Balancing Costs since the start of the incentive scheme and the relevant profiling factors for each Settlement Day. The sum of all the Incentivised Balancing Costs is extrapolated to the end of the scheme using the profiling factors to determine the Forecast Incentivised Balancing Cost.

- Profiling factors have been included to give an effective mechanism for calculating a representative level of the incentive payments to/from NGC according to the time of year. For the initial schemes, the profiling factors will be set to one.

- The Forecast Incentivised Balancing Cost is compared to the agreed incentive scheme parameters to determine a total forecast incentive payment over the duration of the incentive scheme.

- The total forecast incentive payment is then scaled back to the Settlement Day to calculate the daily incentive payment to date. This is done by taking the total forecast incentive payment, dividing by 365 and multiplying by the current sum of the profiles into the scheme.

- Today's incentive payment to date is then compared to the sum of all the daily incentive payments to date to determine today's incentive payment.

3. External System Operator (SO) BSUoS charge ($BSUoSEXT_j$)

This element of the charge arises from the SO incentive scheme on Balancing Mechanism costs.

The total Settlement Period External BSUoS charge ($BSUoSEXT_j$) is calculated as follows:

$$BSUoSEXT_j = CSOBM_j + BSCCV_j + [(IncPayEXT_d + BSCCA_d + ET_d - OM_d) * SPF]$$

The remaining terms not defined above are daily costs that are allocated into Settlement Periods on a MWh volume weighted basis.

$IncPayEXT_j$ This is the daily External incentive payment to or from National Grid which is calculated with reference to the incentive scheme as agreed with Ofgem. The details of calculating the daily incentive payment are explained in the previous section. In general, the incentive payment is based on sliding scale regulation with an overall scheme target, sharing factors, caps and collars.

ET_d These are the Balancing Services Costs which arise from prior year adjustments.

SPF This is the Settlement Period factor that allocates the daily elements of the charge into specific Settlement Period weighted on a total MWh basis.

4. Internal System Operator (SO) BSUoS charge ($BSUoSINT_j$)

This element of the charge arises from the arrangements in place for National Grid to recover the internal costs of the System Operator (SO). These are a mixture of incentivised and non-incentivised costs.

The SO Internal cost elements are described in the SO review conclusions and subject to four different forms of cost recovery:

Incentivised SO Internal Costs: Annual target subject to incentive scheme arrangements. Costs are forecast on a monthly basis and then divided by the number of days in each month to get a daily figure.

- **CSOC** - *The Internal costs associated with the Balancing Services Activity on which we are incentivised.*

Non-Incentivised Costs: Agreed annual fixed costs not subject to incentive arrangements and recovered uniformly across the year.

- **NSOC** – *Is the allowed revenue in respect of the internal costs in operating the system.*

Pass Through Costs: Annual costs recovered uniformly across the year and passed through on a daily basis. The difference between the pass through costs (start of year 1) and outturn (end of year 1) will be added to the pass through costs for year 2 (in the case of SOBR) or on a monthly basis (in the case of PSC).

- **SOBR –** *Is the allowance for business rates in operating the transmission system*
- **PSC -** *Cost incurred in preparing participants systems for the introduction of NETA*

Manifest Errors and Special Provisions

NGC may, in certain circumstances, be required to pay compensation to BSC Parties as a result either of Manifest Errors or Special Provisions (collectively referred to as Contingency Provisions).

An incentivised cost-recovery mechanism for such costs has been included within the internal System Operator BSUoS charge element. This cost-recovery mechanism operates on a monthly basis and provides that NGC is exposed to 40% of any Contingency Provision costs invoiced to it in any month, subject to an overall monthly cap on its exposure of £250,000.

Thus, if the Contingency Provision costs incurred exceed £625,000 (£250,000/0.4) in any month, NGC will be allowed to recover 60% of the costs it incurs up to £625,000, and all the costs in excess of £625000. If costs are less than £625,000 then NGC will recover 60% of these costs.

NGC will calculate any allowable revenue associated with Contingency Provisions based on the invoices received in any particular month. The monthly revenue will then be recovered equally over the days in the following month. Any invoices for the

final month of the financial year will be recovered in the first month of the next financial year.

Calculating and charging out SO Internal costs

The following steps are required to calculate and charge out SO Internal costs:

- STEP 1 : Forecast daily Internal SO Costs (CSOC)
- STEP 2 : Calculate daily SO Internal incentive payment
- STEP 3 : Calculate half hourly BSUoS charge
- STEP 4 : Undertake the rolling cost data amendment of actual forecast incentivised SO Internal costs
- STEP 5 : End scheme reconciliation

STEP 1 : Forecasting daily Internal SO costs (CSOC)

To calculate incentivised SO internal costs, NGC will forecast SO internal costs on a daily basis. Practically, this will involve forecasting costs month ahead and allocating the forecast costs evenly across each settlement day in the month.

STEP 2 : Calculating the daily SO Internal incentive payment

The incentive payment associated with the SO Internal costs will be calculated on a daily basis consistent with the charging principles methodology adopted for the calculation of the external SO cost incentive payment.

STEP 3 : Calculating the half hourly total SO Internal BSUoS charge

The daily SO Internal incentive payment, SO internal costs and Manifest Errors and Special Provisions will then be allocated into each Settlement Period in a settlement day on a BM Unit Metered Volume (QMij) weighted basis, as per external SO costs.

The internal SO BSUoS charge in each Settlement Period ($BSUoSINT_j$) is shown simply below. The daily SO incentive payment ($IncpayINT_d$) plus the SO internal costs elements are multiplied by a 'Settlement Period Factor' (SPF) to allocate the daily SO Internal costs to specific Settlement Periods weighted on a total daily MWh basis. Manifest Errors and Special Provisions costs are included within $IncpayINT_d$.

$$BSUoSINT_j = \left(IncpayINT_d + CSOC_d + NSOC_d + PSC_d + SOBR_d\right) * SPF$$

Where:

$BSUoSINT_j$	Internal SO BSUoS charge for each half hour.
$IncpayINT_d$	Daily SO Internal Incentive Payment.
SPF	This is the Settlement Period factor that allocates the daily elements of the charge into specific Settlement Periods weighted on a total MWh basis i.e. Settlement Period MWh/total daily MWh.
$MESP_d$	Monthly allocated daily costs associated with Manifest Errors and Special Provisions

SO Internal cost elements are defined above.

Step 4 : Rolling data amendment of forecast SO incentivised Internal costs

Any differences between the actual and forecast incentivised SO internal (CSOC) and pass through (PSC) costs will be recovered as follows:

- The forecast incentivised SO Internal (CSOC) and pass through (PSC) costs will be amended on a monthly basis, around 2 months after the event, when actual costs become available.

- For example, If April forecast costs were £0.4m and the actual costs for April were £0.5m, £0.1m will be added to the July forecast costs.

Step 5 : End Scheme Reconciliation

An end scheme reconciliation of BSUoS charges will be undertaken approximately two months after the completion of the internal and external incentive schemes. The reconciliation will be timed so that it occurs after the completion of Initial Settlement for all days in the initial incentive scheme and prior to the commencement of Final Reconciliation for days in the scheme. For the initial incentive scheme this will take place in May 2002.

The following costs will be subject to the end scheme reconciliation:

- **Indexation of incentive scheme parameters**: The internal and external SO incentive scheme targets are indexed on the basis of forecast RPI for financial year 2001/02. These targets will require reconciling at the end of each incentive scheme to reflect the difference between the forecast and actual 2001/02 RPI values.
- **Incentivised Costs (CSOC)**: There will be a requirement to adjust forecast SO internal cost data for the last month of each Financial Year when actual cost data becomes available.
- **Participant Support Costs:** Adjustment of forecast 2001/02 to actual outturn costs.
- **Data and Ancillary disputes:** To include any adjustments that are confirmed prior to the Reconciliation.

The reconciliation will compare daily charges as at Initial Settlement with the daily charge calculated on the basis of the revised parameters. The reconciliation will result in an annual reconciliation amount charged to/from each user. Interest will be added at base rate.

5. Total BSUoS Charge ($BSUoSTOT_j$)

The total Settlement Period BSUoS charge ($BSUoSTOT_j$) is calculated by adding together the internal SO BSUoS charge ($BSUoSINT_j$) and the external SO BSUoS charge ($BSUoSEXT_j$) for the Settlement Period, shown as follows:

$$BSUoSTOT_j = BSUoSINT_j + BSUoSEXT_j$$

6. Allocating the BSUoS Charge

The Lead Party of each registered BM Unit (as described in Section K3 of the BSC) is liable to pay BSUoS charges. Each Lead Party pays a share of the charge in each Settlement Period based on their share of total BM Unit Metered Volume.

To allocate the total Settlement Period BSUoS charge to each customer, the Balancing Services Price (BSP) £/MWh must be determined. This is a price for each MWh transported over the Transmission System, calculated, in each Settlement Period, by dividing the total BSUoS charge ($BSUoSTOT_j$) with the total BM Unit Metered Volume (SQM_{ij}) adjusted for transmission losses through the application of the Transmission Losses Multiplier (TLM_{ij}) in each Settlement Period, shown below:

$$BSP_j = \frac{BSUoSTOT_j}{\left\{\left|\sum^{+}(QM_{ij} * TLM_{ij})\right| + \left|\sum^{-}(QM_{ij} * TLM_{ij})\right|\right\}}$$

Where:

$\sum^{+}$ - refers to the sum over all BM Units that are in delivering Trading Units in Settlement Period 'j.'

$\sum^{-}$ - refers to the sum over all BM Units that are in offtaking Trading Units in Settlement Period 'j.'

'delivering' and 'offtaking' in relation to Trading Units have the meaning set out in the Balancing and Settlement Code

The BSP is then multiplied by the BM Unit Metered Volume (QM_{ij}) adjusted for transmission losses, to give a charge for the Lead Party of each BM Unit in a specific Settlement Period.

This charge is positive (i.e. payment to NGC from the BSC Party) when:

- The BM Unit is exporting (generating) and the Trading Unit in which it resides is in delivery mode, or if the BM Unit is importing (consuming) and the Trading Unit in which it resides is in offtake mode.

This charge is negative (i.e. payment to the BSC Party from NGC) when:

- The BM Unit is exporting (generating) and the Trading Unit in which it resides is in offtake mode, or if the BM Unit is importing (consuming) and the Trading Unit in which it resides is in delivery mode.

The Settlement Period charges for each BM Unit are summed over a Settlement Day, and allocated to the BSC Party. In the case where there is more than one BSC Party associated to a given BM Unit, the charge is allocated in total to the Lead Party. No charge is allocated to a BSC Party where they are a Subsidiary Party for that BM Unit.