17 January 2003

The National Grid Company, BSC Signatories and
Other Interested Parties

Our Ref: MP No P105

Dear Colleague

**Modification to the Balancing and Settlement Code ("BSC") - Decision and Notice in relation to Modification Proposal P105: "Introduction of zonal transmission losses on a marginal basis without phased implementation"**

The Gas and Electricity Markets Authority (the "Authority")[1] has carefully considered the issues raised in the Modification Report[2] in respect of Modification Proposal P105, "Introduction of zonal transmission losses on a marginal basis without phased implementation".

The Balancing and Settlement Code Panel (the "Panel") recommended to the Authority that the Modification Proposal should not be made.

Having considered the Modification Report and the Panel's recommendation and having regard to the Applicable BSC Objectives and the Authority's wider statutory duties, the Authority has decided not to direct a Modification to the BSC.

This letter explains the background to the Modification Proposal and sets out the Authority's reasons for its decision.

Ofgem notes the recommendation of the Panel that the arrangements put forward in Modification Proposal P82 (original and Alternative), Modification Proposal P75 (original and Alternative) and Modification Proposal P105 are mutually exclusive i.e. that it is only possible to determine in favour of one of the five proposals. Whilst Ofgem accepts that this is true and has considered the issues raised in these modification proposals concurrently, each Modification Proposal has been the subject of a separate determination, as required by the BSC and the Transmission Licence. Nonetheless, the determinations in respect of all these Modification Proposals are being issued simultaneously.

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[1] Ofgem is the office of the Authority. The terms "Ofgem" and "the Authority" are used interchangeably in this letter.
[2] ELEXON document reference P105RR, Version No. 1.0, dated 16 December 2002.

**Background**

Some electricity is used up in the process of its transportation from power plants to electricity consumers. The electricity lost on the transmission network is commonly referred to as "transmission losses".

There are two types of losses: variable losses and fixed losses. Variable losses account for the majority of electricity lost. These are a function of the current flowing through a circuit or transformer windings, causing heating of the transmission lines, cables and transformer windings. These variable losses therefore increase with the distance that the electricity has to travel. Fixed losses, which are unrelated in the short run to the distance that the electricity has to travel, occur in both transformers and the overhead lines. For transformers, the fixed losses arise in their iron cores, which are subject to an alternating magnetic field, and do not vary significantly with the power flow through the transformer. Overhead line fixed losses are relatively small and dependent on voltage levels and weather conditions.

The current arrangements for allocating transmission losses are set out in Section T.2 of the BSC. Transmission losses are presently recovered on a uniform basis and divided between generators and suppliers[3] on a 45/55 split. [4] The rules apply a transmission loss multiplier ("TLM") to all metered volumes of BSC Participants to scale these to account for transmission losses. The TLM is calculated on a half-hourly basis to take account of the actual transmission losses in each Settlement Period. The TLM is derived from a transmission loss factor ("TLF"), which is currently set to zero for all Balancing Mechanism Units ("BMUs"), and transmission loss adjustments ("TLMOs") [5], which are different for offtaking and delivering BMUs (TLMO- and TLMO+ respectively). The TLMOs ensure that 45% of the actual transmission losses are allocated to generators (delivering BMUs) and 55% to suppliers (offtaking BMUs).

The need to review the basis of charging for transmission losses was referred to in the Pooling & Settlement Agreement, introduced in 1990, and there has been a long standing regulatory commitment to reform transmission losses, supported initially by the Director General of Electricity Supply ("DGES") and subsequently by Ofgem. In November 1995, the DGES wrote to the Electricity Pool (the "Pool") Chairman asking the Pool to develop proposals for a more cost-reflective charging of transmission losses. Subsequently, a proposal for charging transmission losses on a zonal basis was developed and the proposal was approved by the majority of Pool members. However, this decision was appealed to the DGES for determination. The DGES upheld the Pool's resolution, and a date of November 1997 was set for implementation of the scheme. Two Pool members challenged the DGES determination by judicial review on procedural grounds. While the judicial review did not proceed to hearing, the arrangements

[3] For the purposes of this letter when Ofgem makes reference to suppliers this includes all customers who are directly connected to NGC's transmission system.

[4] The 45:55 split is equivalent to a 50:50 split, by taking into account that the Defined Meter Point for generation is the high voltage side of the generator transformer, whereas that for demand is the low voltage side of the supergrid transformer. Therefore, the loss volumes calculated do not take into account the supergrid transformer losses already incurred by generators, but do include the supergrid transformer losses on the demand side. This split in the responsibility for losses between generators and suppliers was introduced with NETA in March 2001. Previously all the losses were allocated to suppliers.

[5] It is noted that TLMO is not a direct abbreviation of transmission loss adjustments. However, it is the formulation used in the BSC to denote this.

envisaged were not implemented in 1997 and the matter was superseded by the review of the Pool based trading arrangements and the introduction of the New Electricity Trading Arrangements in 2001. The basis for charging for transmission losses was incorporated into the BSC, which was introduced in March 2001, and became subject to the normal governance arrangements for modifying the BSC.

**The Modification Proposal**

The Proposer, Powergen, submitted Modification Proposal P105, "Introduction of zonal transmission losses on a marginal basis without phased implementation" on 24 October 2002. The Proposer considered that the Modification Proposal would better facilitate achievement of Applicable BSC Objectives[6] (b) and (c) as set out in Condition C3.3 or NGC's Transmission Licence.

The Proposer considered that the current uniform approach to allocating transmission losses fails to provide appropriate cost signals and that it provides hidden cross subsidies for northern generation and southern demand. The Proposer considered that introducing a zonal allocation of transmission losses would provide appropriate locational signals to parties which would help reduce overall transmission losses in the short-term and encourage more optimal siting of generation and demand in the longer-term.

The Modification Proposal seeks to modify the BSC to introduce zonal transmission losses. The modification proposes that ELEXON[7] would appoint a Transmission Loss Factor Agent ("TLFA") to calculate zonal marginal TLFs that would be fixed in advance for a month at a time. The TLFs would be calculated in accordance with a Transmission Loss Factor Methodology ("TLFM"), which would be set out in the BSC. The method for calculating the TLFs would be defined in the BSC and would have the following features:

- The TLFs would be calculated using a Direct Current (DC) load flow modelling technique;
- The initial calculation would involve estimating nodal marginal factors based on network configuration data for a representative collection of historic power system conditions, based on an intact network, during the relevant month of the previous year;
- The nodal marginal factors would be converted to zonal marginal factors by volume-weighted averaging; with the zones for generation corresponding to the current generation Transmission Network Use of System ("TNUOS") zones and those for demand to the current Grid Supply Point ("GSP") Groups; and

[6] The Applicable BSC Objectives, as contained in Condition C3.3 of NGC's Transmission Licence, are:
(a) the efficient discharge by the licensee of the obligations imposed upon it by this licence;
(a) the efficient, economic and co-ordinated operation by the licensee of the licensee's transmission system;
(a) promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity;
(a) promoting efficiency in the implementation and administration of the balancing and settlement arrangements;
(a) without prejudice to the foregoing objectives and subject to paragraph 3A, the undertaking of work by BSCCo (as defined in the BSC) which is:
(i) necessary for the timely and effective implementation of the proposed British Electricity Trading and Transmission Arrangements (BETTA); and
(ii) relevant to the proposed GB wide balancing and settlement code;
and does not prevent BSCCo performing its other functions under the BSC in accordance with its objectives.

[7] ELEXON is the BSC CO

- The Settlement Period zonal marginal factors would be converted to monthly zonal marginal factors (the TLFs) by time-weighted averaging.

The TLFs calculated in this fashion would be used in the calculation of the TLMs, as described in section T.2.3 of the BSC. As at present, the TLMs would be used to multiply the metered volumes of generators and demand to adjust them for transmission losses.

The Panel considered the Initial Written Assessment for the Modification Proposal at its meeting of 14 November 2002 and agreed to submit it directly to the Report Phase. ELEXON published a draft Modification Report on 22 November 2002, which invited respondents' views by 2 December 2002. The draft Modification Report contained a provisional recommendation by the Panel that the Modification Proposal does not better facilitate the achievement of the Applicable BSC Objectives and should not be made.

**Respondents' views**

ELEXON received 16 responses to the consultation on the draft Modification Report. Of these, 12 agreed with the Panel's recommendation to reject the Modification Proposal, two disagreed with the Panel's recommendation and the remaining two respondents did not express an opinion on the Panel's recommendation.

Of the respondents that supported the Panel's recommendation four commented that a zonal transmission losses scheme should have a phased implementation.

One respondent considered that the Modification Proposal would impact on the development of renewable generation and would put at risk the ability of the industry to achieve the government's targets in this area. This respondent also considered that the Modification Proposal would be contrary to Ofgem's statutory duty with respect to the environment.

The two respondents that disagreed with the Panel's recommendation considered that the Modification Proposal should be made as it would remove the current cross subsidy in the allocation of transmission losses and improve efficiency in competition. One of these respondents considered that a marginal scheme would provide the most accurate locational signals. In addition, this respondent considered that phased implementation would delay full realisation of the benefits resulting from zonal transmission losses and would not be required because the possibility has been known to both investors and market participants for some time.

Finally, two respondents specifically mentioned the British Electricity Trading and Transmission Arrangements ("BETTA") in their response. These respondents considered that that any zonal transmission losses scheme should not be implemented before a detailed consideration of the impact of BETTA has been undertaken.

**Panel's recommendation**

The Panel met on 12 December 2002 and considered the Modification Proposal, the draft Modification Report and the consultation responses received.

The Panel considered that the issues associated with P105 and Modification Proposal P105 had already been considered by the Transmission Loss Factor Modification Group (the "Group"). A majority of the Group had been of the opinion that phased implementation was necessary to better facilitate achievement of the Applicable BSC Objectives. This was because competition would be promoted by a smooth transition to zonal losses and forward contracts could be protected.

The Panel recommended that the Authority should reject the Modification Proposal.

The Panel also recommended that in the event that the Authority determines that Modification Proposal P105 should be made, the Implementation Date should be 1 April 2004, where an Authority determination is received by 17 January 2003. Where an Authority determination is received after this date, but before 31 March 2003, the Implementation Date should be 1 October 2004.

**Ofgem's view**

Having carefully considered the Modification Report and the Panel's recommendation, Ofgem considers, having had regard to the Applicable BSC Objectives and its statutory duties[8] that, on balance, Modification Proposal P105 does better facilitate achievement of the Applicable BSC Objectives. However, Ofgem has decided not to direct a modification to the BSC for the reasons set out below.

Applicable BSC Objective (b); enhancing the efficient economic and co-ordinated operation by the licensee (NGC) of its transmission system.

Ofgem considers that the adoption of zonal transmission losses would remove cross subsidies which the present uniform charging for transmission losses creates. If charges do not reflect costs, there will be cross subsidisation in the charging arrangements which will tend to have two effects:

- in the short run costs are higher than would otherwise be the case. Cross subsidisation will lead to some plant generating when it would be less costly for it not to generate, whilst other plant, which it would be more efficient to use, is not generating. Similarly, cross subsidies are likely to result in the pattern of electricity consumption failing to more fully reflect the costs of providing the electricity; and
- in the long run there will be a tendency towards an inefficient (locational) pattern of investment in generation and closure of generation with a consequential adverse impact on transmission. There could also be inefficiency in the location of demand.

These inefficiencies have economic and environmental costs, the size of which will depend upon system conditions.

The introduction of zonal transmission losses would enhance efficiency through more cost reflective charging and would also influence both short and long term business decisions. This

[8] Ofgem's statutory duties are wider than the matters that the Panel must take into consideration and include amongst other things social and environmental guidance provided to Ofgem by the Government.

enhanced efficiency is of particular importance over the next 20 years given the potential major changes in the type and distribution of plant, especially as a result of the government's climate change commitments. In principle therefore, based on the benefits that could accrue, the implementation of this Modification Proposal could better facilitate the achievement of Applicable BSC Objective (b).

Applicable BSC Objective (c) - promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity.

In general, uniform pricing presents a barrier to competition as it offers less scope for competitors to secure a lower cost. The present uniform pricing arrangements artificially impose higher costs on generators in the south and suppliers in the north. This restricts the market for generation alternatives in the south (whether this be Combined Heat and Power ("CHP") or other forms of new generation) and supply in the north. Consequentially, introducing differential charges would have a positive effect on competition. However, Ofgem was concerned that some participants consider that the allocation of fixed and variable losses in a marginal scheme (such as the original Modification Proposal) would introduce new cross subsidies in the opposite direction to those presently existing. Ofgem agrees that, allocating fixed losses on a marginal basis may be inappropriate. Therefore, Ofgem considers that it is unclear whether the Modification Proposal would better facilitate the achievement Applicable BSC Objective (c).

Applicable BSC Objective (a) - the efficient discharge by the licensee (NGC) of the obligations imposed upon it by its licence

NGC has a range of statutory duty and licence obligations which include ensuring the efficient, economic and co-ordinated operation of the system, the facilitation of competition[9] and non-discrimination in its charges[10]. As we have set out above, Ofgem considers that the Modification Proposal could enhance NGC's discharge of the first of these obligations, but that it is unclear whether it will enhance its discharge of the second obligation. Ofgem was concerned that some participants consider that the allocation of fixed and variable losses in a marginal scheme (such as the Modification Proposal) would introduce new cross subsidies in the opposite direction to those presently existing. Ofgem does not consider this would constitute discrimination in that fixed costs can not be attributable to any particular BSC Party. But as outlined above, agrees that allocating fixed losses on a marginal basis may be inappropriate. Ofgem, on balance, considers that the Modification Proposal will better facilitate the achievement of Applicable BSC Objective (a).

The benefits of removing market distortions, such as uniform losses, are generally difficult to quantify, since they depend upon the uncertain and unknowable evolution of the relevant market including, in this case, transmission system conditions. As the Panel noted, any calculation is highly dependent on the assumptions made. Although a marginal scheme (such as this Modification Proposal) would have higher benefits than an average zonal losses scheme

[9] Section 9 (2) (b) of the Electricity Act 1989

[10] Condition C7C of the Transmission Licence.

(such as Modification Proposal P82) the costs will also be higher since the loss factors would be calculated on a monthly rather than an annual basis. Although as this Modification Proposal was submitted directly to report phase.

As Ofgem has concluded that the Modification Proposal could better facilitate achievement of at least one of the Applicable BSC Objectives, it was additionally necessary to consider the Modification Proposal in relation to the statutory duties of the Authority. Ofgem considers that the Modification Proposal would deliver consequential benefits in accord with its principle objective[11] to protect the interests of consumers, present and future, by promoting competition in the electricity industry. Average zonal charges can be expected to reduce the total costs of generating and transmitting electricity (together with concomitant environmental benefits) in the short and longer run to the overall benefit of present and future consumers.

Ofgem additionally has a statutory duty in relation to the environment and has received government guidance on the subject[12] and it considers that the Modification Proposal would be consistent with that duty and guidance, as described in our decision letter on Modification Proposal P82.

While as stated above, each BSC modification proposal must be considered on its own merits, where there are concurrent modification proposals before the Authority on similar issues, it is for the purposes of the decision before the Authority relevant and appropriate to consider the degree of relative achievement of the Applicable BSC Objectives where each modification proposal on its own merits appears to better facilitate the achievement of the Applicable BSC Objectives but practically only one modification proposal can be implemented.

In this case, the Authority has concluded that Modification Proposal P105 does better facilitate the achievement of Applicable BSC Objectives (a) and (b). Having established this, it is reasonable to compare this degree of relative achievement of the Applicable BSC Objectives with that identified for Modification Proposal P82 which also better facilitates the achievement of the Applicable BSC Objectives (a), (b) and (c). For the reasons set out the Authority's decision letter on Modification Proposal P82 issued by the Authority today, Ofgem considers that, on balance, Modification Proposal P82 represents a better achievement of the Applicable BSC objectives.

In making the decision not to approve the Modification Proposal to the BSC, the Authority has decided not to conduct a consultation upon GB issues in relation to this Modification Proposal. Ofgem has today issued a letter which explains the consultation process for Modifications to the BSC prior to and during the course of legislation to introduce BETTA.

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[11] The principal objective and general duties of the Authority are set out at section 3A, 3B and 3C of the Electricity Act 1989. The principal objective of the Authority is to "protect the interests of consumers in relation to electricity conveyed by distribution systems, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the generation, transmission, distribution or supply of electricity." Section 3A (6) provides that "consumers" includes both existing and future consumers.

[12] The guidance says: "There are significant greenhouse gas emissions as a result of losses in both gas and electricity. More extensive embedded generation and CHP, as outlined above, may help to reduce those losses. In addition, the Authority, in exercising its functions, should have regard to the desirability of reducing those losses through other means, given the contribution that this would make to meeting the government's Climate Change commitments and objectives." (Social and Environmental Guidance, November 2002).

The Authority is mindful that there are further modification proposals upon related matters currently in assessment. As with all modifications, the Authority's decision on P105 will in no way fetter its discretion when these proposals come to it for determination.

**The Authority's decision**

The Authority has therefore decided not to direct that Modification Proposal P105, as set out in the Modification Report for Modification Proposal P105, should be made and implemented.

Having regard to the above, the Authority, in accordance with Section F1.1.4 of the BSC, hereby notifies NGC that it does not intend to direct NGC to modify the BSC as set out in the Modification Report.

If you have any queries in relation to the issues raised in this letter contact Sonia Brown on 020 7901 7412 or Richard Ford on 020 7901 7411.

Yours sincerely

**Callum McCarthy**
**Chairman of the Gas and Electricity Markets Authority**
**Chief Executive of Ofgem**
Signed on behalf of the Authority and authorised for that purpose by the Authority