17 January 2003

The National Grid Company, BSC Signatories and
Other Interested Parties

Our Ref: MP No P82

Dear Colleague

Modification to the Balancing and Settlement Code ("BSC") - Decision and Direction in relation to Modification Proposal P82: "Introduction of zonal transmission losses on an average basis"

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 P82, "Introduction of zonal transmission losses on an average basis".

The BSC Panel (the "Panel") recommended to the Authority that neither the original Modification Proposal nor the Alternative Modification Proposal 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 to direct a Modification to the BSC in line with the original Modification Proposal P82.

This letter explains the background to the Modification Proposal and sets out the Authority's reasons for its decision. In addition, the letter contains a direction to The National Grid Company plc ("NGC") to modify the BSC in line with the original Modification Proposal P82, as set out in the Modification Report. This letter constitutes the notice by the Authority under section 49A of the Electricity Act 1989 in relation to the direction.

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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 P082RR, Version No. 1.0, dated 16 December 2002.

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. The determinations in respect of all these Modification Proposals are being issued simultaneously.

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

[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.

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 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, First Hydro Company, submitted Modification Proposal P82, "Introduction of zonal transmission losses on an average basis" on 3 May 2002. The Proposer considered that the Modification Proposal would better facilitate achievement of the Applicable BSC Objectives[6] (c) and (d) as set out in Condition C3.3 of NGC's Transmission Licence.

The Proposer considered that the Modification Proposal would allocate transmission losses in a manner that would not unduly penalise any individual BMUs. The Proposer also considered that the Modification Proposal would introduce long term economic signals for the siting of generation and demand and that this would promote effective competition in the generation and supply of electricity.

The Modification Proposal set out that ELEXON[7] would appoint a Transmission Loss Factor Agent ("TLFA") to calculate zonal TLFs that would be fixed in advance for a year at a time (April to the following March). 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 during the previous year from January to December;

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[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 nodal marginal factors would be converted to zonal marginal factors by volume-weighted averaging, with the zones for both generation and demand corresponding to the current Grid Supply Point ("GSP") Groups;
- The Settlement Period zonal marginal factors would be converted to annual zonal marginal factors by time-weighted averaging; and
- The annual zonal marginal factors would be scaled by a factor of 0.5 to create the final TLFs.

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 suppliers to adjust them for transmission losses.

The Panel considered the Initial Written Assessment for the Modification Proposal at its meeting of 16 May 2002 and agreed to submit it to a six month Assessment Procedure. The Panel considered that the Transmission Loss Factor Modification Group (the "Group") should consider the Modification Proposal in parallel with Modification Proposal P75 "Introduction of zonal transmission losses".

In its Interim Report to the Panel, issued for the 18 July 2002 Panel meeting, the Group set out its initial findings and its intention to procure a modelling service in order to assess the impact of the Modification Proposal. The Panel agreed with the intention to procure a modelling service.

The Group set up two sub-groups to agree a requirement specification for the modelling service and the input data to be used for the modelling exercise. An invitation to tender for the modelling service was issued on 22 July 2002. Power Technologies International ("PTI") won the tender and was awarded the contract on 15 August 2002.

Preliminary results from PTI's modelling work were made available to all interested parties for the assessment consultation, which was issued on 2 October 2002. PTI delivered its final report on the results of the load flow modelling of both Modification Proposal P75 and Modification Proposal P82 on 14 October 2002. The assessment consultation closed on 21 October 2002.

The Group reviewed PTI's modelling results and the responses to the assessment consultation and agreed to refine the original Modification Proposal. The Group considered that the network configuration data for the load flow model should be based on a historical, intact network configuration. The Group also considered that the conversion of metered volumes into nodal metered volumes should be by specified mapping.

Parties were requested to undertake an Impact Assessment on Modification Proposal P82. In addition, ELEXON undertook an impact assessment on BSC Systems and Services.

During the assessment, the Group developed an Alternative Modification Proposal. The only difference between the original Modification Proposal and the Alternative Modification Proposal is that the Alternative Modification Proposal has a phased implementation over four years.

The Group considered that a phased implementation would smooth the impact of zonal differentiation of TLFs and protect forward contracts made prior to the introduction of zonal loss factors. The Group discussed several alternative phasing methods but finally settled on a

scheme which was referred to as the "ß-phasing approach". With this phasing mechanism, the Alternative Modification Proposal would be phased in gradually over four years. In the first year following implementation, the TLFs applied would be set to 25% of their calculated values. In the second year, they would be set to 50% of their calculated values whilst in the third year they would be set to 75% of their calculated values. From the fourth year onwards, the TLFs would equal their full calculated values.

The majority of the Group considered that the original Modification Proposal would better facilitate achievement of the Applicable BSC Objectives. They considered that zonal differentiation would result in a more accurate allocation of the cost of losses, thus facilitating better achievement of Applicable BSC Objectives (b) and (c). However, the majority of the Group additionally considered that phased implementation would smooth the impact of zonal differentiation and therefore that the Alternative Modification Proposal better facilitated achievement of the Applicable BSC Objectives than the original Modification Proposal.

Consequently, the Group recommended in the Assessment Report submitted to the Panel that the draft Modification Report should contain a provisional recommendation that the Alternative Modification should be made and the original Modification Proposal should not be made.

ELEXON published a draft Modification Report on 21 November 2002, which invited respondents' views by 4 December 2002. The draft Modification Report contained a provisional recommendation by the Panel that neither the original Modification Proposal nor the Alternative Modification Proposal better facilitated the achievement of the Applicable BSC Objectives and both should be rejected.

Respondents' views

ELEXON received 18 responses to the consultation on the draft Modification Report. Of these, 13 agreed with the Panel's recommendation to reject both the original Modification Proposal and the Alternative Modification Proposal, four disagreed with the Panel's recommendation and the remaining respondent did not express an opinion on the Panel's recommendation.

Of the respondents that disagreed with the Panel's recommendation, one supported the original Modification Proposal, one supported the Alternative Modification Proposal and two supported both the original Modification Proposal and the Alternative Modification Proposal. All four respondents considered that the introduction of zonal losses would remove the current cross-subsidy and allocate transmission losses to those who give rise to them, thereby improving efficiency. One respondent in favour of the Alternative Modification Proposal also considered that it would result in more efficient despatch in the short-term and more efficient location of generation and demand in the long-term. Another respondent in favour of both the original Modification Proposal and the Alternative Modification Proposal considered that the use of GSP Group zones for both generation and demand TLFs would ensure that there were no perverse locational incentives. One of these respondents considered that the use of marginal loss factors does not result in an allocation of losses to those that give rise to them and that this is better achieved by applying a scaling factor of 0.5 to the marginal loss factor as is the case in Modification Proposal P82.

Most of the respondents opposed to both the original Modification Proposal and the Alternative Modification Proposal considered that the costs of its implementation could outweigh any benefits that might be delivered, since any perceived net benefit had not been proven. Respondents were also concerned that no significant cost benefit analysis had been carried out. Concerns were additionally raised as to whether the benefits of the reforms would be passed on to end customers. Three respondents commented that demand would not be able to respond to any locational signals arising from a zonal allocation of transmission losses.

One respondent considered that both the original Modification Proposal and the Alternative 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 original Modification Proposal and the Alternative Modification Proposal would be contrary to Ofgem's statutory duty with respect to the environment.

Comments were also received from five respondents on phasing the implementation of the reforms, and whether the original Modification Proposal or the Alternative Modification Proposal better facilitated the achievement of the Applicable BSC Objectives. Of these, two respondents were against phased implementation, as this would delay delivering the full benefits of the Modification Proposal. The three remaining respondents considered that there should be a phased implementation to provide protection for existing contracts.

Finally, five 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 original Modification Proposal, the Alternative Modification Proposal, the draft Modification Report, the views of the Modification Group and the consultation responses received.

The Panel was of the opinion that it had not been proven that zonal differentiation would result in a more accurate allocation of the cost of losses. In addition, the Panel considered that, on balance, the effect of any gains in the accuracy of cost allocation would be outweighed by the industry-wide costs associated with implementation of the original Modification Proposal. Furthermore, a majority of Panel members believed that the phased implementation, which differentiates the Alternative Modification Proposal from the original Modification Proposal, would not be sufficient to yield a net benefit.

The Panel recommended that the Authority should reject both the original Modification Proposal and the Alternative Modification Proposal.

The Panel also recommended that, if either the original Modification Proposal or the Alternative Modification Proposal should be approved by the Authority, 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 that, having had regard to the Applicable BSC Objectives and its statutory duties[8], the original Modification Proposal does better facilitate achievement of the Applicable BSC Objectives (a), (b) and (c). Ofgem considers, on balance and without limitation, that the most significant benefit arises in relation to Applicable BSC Objective (b).

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

Ofgem considers that the adoption of zonal transmission losses will remove cross subsidies which the present uniform charging for transmission losses create. 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 reflect fully 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 will therefore enhance efficiency through more cost reflective charging which could be expected to influence both short and long term business decisions. This 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. The implementation of this Modification Proposal will therefore better facilitate the achievement of the 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

[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.

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 could have a positive effect on competition. Ofgem therefore considers that the original Modification Proposal will better facilitate the achievement of the Applicable BSC Objective (c).

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

NGC has a range of statutory duties and licence obligations which include ensuring the efficient, economic and co-ordinated operation of the system, the facilitation of competition[9] and non-discrimination[10]. As we have set out above, Ofgem considers that the original Modification Proposal will enhance NGC's discharge of the first two of these obligations. Addressing the cross subsidy in the present transmission losses charging arrangements through more cost reflective charging will also help to remove the discrimination that exists in the present arrangements. Therefore the original Modification Proposal will better facilitate the achievement of the Applicable BSC Objective (a).

In summary, Ofgem considers that the Modification Proposal will better facilitate the achievement of the Applicable BSC Objectives (a), (b) and (c).

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. A variety of commentators have looked at quantifying the benefits of more locational charging for transmission losses. For a scheme of this nature commentators estimated short run benefits in the range of £0.2m p/a to more than £1.5m p/a. Estimates of long run benefits range from £5.3m p/a upwards to very substantially higher figures.

To consider the net effect of the original Modification Proposal, Ofgem has also considered its likely costs. ELEXON has indicated that the likely NETA Central Service Agent costs associated with implementing original Modification Proposal P82 are £109,100 (ex VAT) with on-going costs of £1440 per month (ex VAT). ELEXON will additionally have to appoint a TLFA. Ofgem has also given careful consideration to respondents' views on the cost impact on their internal systems and process. Overall, respondents indicated that they would be much lower than those for Modification Proposal P75. Further, 6 out of the 18 respondents said that the costs would be minimal or zero.

Given ELEXON's and respondents' expectations of potentially low implementation costs and commentators' assessments of substantial benefits, Ofgem considers that there are likely to be significant net benefits from implementing the original Modification Proposal.

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

[10] Condition C7C of the Transmission Licence

In addition to considering the Applicable BSC Objectives as the BSC Panel must do, Ofgem, having concluded that the original Modification Proposal better facilitates achievement of the Applicable BSC Objectives, must further have regard to the wider statutory duties of the Authority. Ofgem considers that the consequential benefits that the original Modification Proposal will deliver accord with its principal objective[11] to protect the interests of consumers, present and future, where appropriate by promoting competition in the electricity industry.

As was noted by some respondents, the present set of uniform charges embodies a cross subsidy against northern consumers, which zonal losses will help to remedy. In addition, 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]. To the extent that zonal charging of losses influences the use of existing generation, the location of future plant closures and new build, and potentially, also demand, it will tend to reduce the total extent of electricity transmitted and the required size of the transmission grid. This may have a beneficial effect on any health related effects of transmission, on the environmental appearance of the system and, perhaps most significantly, on environmental pollution in the form of carbon emissions which would otherwise result from the more inefficient development and operation of the transmission system.[13]

Ofgem has also examined the impact of more zonal losses on other government climate change initiatives. The Renewables Obligation (RO) is designed to stimulate the development of renewable generation and other government initiatives such as the Climate Change Levy (CCL) are aimed at promoting other environmentally less damaging generation such as CHP. The adoption of more cost reflective charging for losses will encourage the more effective location of such plants, including encouraging the development of otherwise marginally uneconomic plant located in more southern regions, which might have not otherwise been developed. To the extent that northern areas have a higher proportion of sites suitable for renewable generation development (including in terms of available resource, costs and output) then the change to more cost reflective charging should not unduly influence such development decisions.

Having considered the achievement of the Applicable BSC Objectives in relation to the original Modification Proposal and its statutory duties, Ofgem has also considered the Alternative

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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 Environment Guidance, November 2002).

[13] For example, depending on the type of plant whose output is reduced as a result of implementing the original Modification Proposal, in the short term carbon emissions could be reduced by between 2000 tonnes p/a and 6000 tonnes p/a, In the long run, the savings could increase to between 48,000 tonnes p/a and 127,000 tonnes p/a.

Modification Proposal. The Alternative Modification Proposal phases the introduction of the original Modification Proposal in over four years.

An argument put forward by respondents for phasing is that it would give market participants time to adjust to the new situation. This argument has to be set against the opposing arguments that delay would reduce the net benefits of the change and that the change has already been long awaited. In Ofgem's view, the selection of 1 April 2004 as the earliest implementation date for the original Modification Proposal already gives participants considerable time to adjust to the new arrangements, especially since changes to participants' procedures and systems in relation to this Modification Proposal are likely to be minimal, according to their analysis.

In this regard, it is important to note that a change to strengthen the signals of transmission losses has been foreshadowed since 1990 so that market participants have had the opportunity to take it into account in planning and investment over the intervening years.

Better charging signals will lead to more efficient use of existing plant and more informed locational decisions, both of which are immediate as well as long term issues (decisions on closures and new plant are likely to have to be taken in the next few years as well as over the longer term).

On this basis Ofgem considers that the case for further phasing is unpersuasive and that there is a strong efficiency case for the earlier implementation of the improved price signals. Accordingly, Ofgem has decided not to direct the Alternative Modification Proposal.

In making the decision to approve the original Modification Proposal to the BSC, the Authority has decided not to conduct a consultation upon GB issues in relation to these Modification Proposals. 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.

There are further modification proposals currently in assessment which may relate to the subject of this decision. As with all modifications, the Authority's decision on Modification Proposal P82 will in no way fetter its discretion as regards any further proposals that may come to it for determination in the future.

The Authority's decision

The Authority has therefore decided to direct that the original Modification Proposal P82, as set out in the Modification Report, should be made and implemented.

Direction under Condition C3 (5) (a) of NGC's Transmission Licence

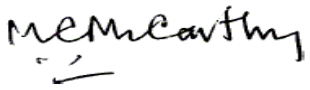
Having regard to the above, the Authority, in accordance with Condition C3 (5) (a) of the licence to transmit electricity granted to NGC under Section 6 of the Electricity Act 1989 (the "Transmission Licence"), hereby directs NGC to modify the BSC as set out in the Modification Report for the original Modification Proposal.

The Implementation Date for original Modification Proposal P82 is 1 April 2004.

In accordance with Condition C3 (5) (b) of NGC's Transmission Licence, NGC shall modify the BSC in accordance with this direction of the Authority.

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