

**INITIAL WRITTEN ASSESSMENT
OF MODIFICATION PROPOSAL
P075**

**Introduction of Zonal Transmission
Losses**

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1 INTRODUCTION

This Report has been prepared by ELEXON Ltd. on behalf of the Balancing and Settlement Code Panel ('the Panel'), in accordance with the terms of the Balancing and Settlement Code ('BSC'). The BSC is the legal document containing the rules of the balancing mechanism and imbalance settlement process and related governance provisions. ELEXON is the company that performs the role and functions of the BSCCo, as defined in the BSC.

An electronic copy of this document can be found on the BSC website, at www.elexon.co.uk.

1.1 Executive Summary

Modification Proposal P075 ('the Modification') 'Introduction of Zonal Losses' was submitted on 5 April 2002 by Powergen.

The Modification seeks to modify the BSC so that transmission losses are allocated to production and consumption on a zonally differentiated basis. Currently, allocation is on a uniform basis, with a defined split between generation and demand. The proposed mechanism for the allocation of transmission losses is the use of the established parameters - Transmission Loss Factors ('TLFs'). These factors are currently set to zero. Under the Modification, a new BSC Agent (the Transmission Loss Factor Agent or 'TLFA') would generate a set of zonal TLFs, which would be provided as input to the settlement calculations.

An initial assessment of the Modification has identified the following potential areas of impact and issues to be considered:

- There will be an impact on BSC Systems, Parties, the BSC and Subsidiary documents and on ELEXON and its contractual arrangements.
- There may be an additional workload on the Panel who may need to determine certain pre-requisites for producing TLFs.
- Whilst the precise details of a Transmission Loss Methodology ('TLM') are not prescribed, the broad outlines of a potential TLM and of the role of the proposed TLFA are suggested. Therefore, the Modification Proposal needs to be defined in sufficient detail to enable assessment.

1.2 Recommendations

The Panel is invited to:

- **NOTE the results of the Initial Written Assessment;**
- **DETERMINE that Modification Proposal P75 is submitted to the Definition Procedure (in accordance with section F2.5 of the Code);**
- **ENDORSE the Definition Procedure timetable and that the Definition Report be submitted to the Panel meeting on 16 May 2002;**
- **DELEGATE authority to the Panel Chairman to agree members of the Modification Group established by ELEXON to consider this proposal; and**
- **ENDORSE that Modification Group's Terms of Reference specify that the Definition Procedure be limited to determining a consistent and complete definition of the Modification.**

2 PURPOSE AND SCOPE OF THE REPORT

Section F of the BSC sets out the procedures for progressing proposals to amend the BSC (known as 'Modification Proposals'). These include procedures for proposing, consulting on, developing, evaluating and reporting to the Authority on potential modifications.

The BSC Panel is charged with supervising and implementing the modification procedures. ELEXON provides the secretariat and other advice, support and resource required by the Panel for this purpose. In addition, if a modification to the Code is approved or directed by the Authority, ELEXON is responsible for overseeing the implementation of that amendment (including any consequential changes to systems, procedures and documentation).

When a new proposal to modify the BSC is made, it is the responsibility of the Panel to determine how it should be progressed. Options include submitting the proposal to a Definition Procedure¹, submitting it to an Assessment Procedure², amalgamating the proposal with another proposal³, or proceeding directly to the Report Phase⁴. With a view to assisting the Panel in taking this decision, ELEXON prepares this initial written assessment of the implications of the Modification Proposal as soon as reasonably practicable after the proposal is made⁵. ELEXON endeavours to complete this initial assessment such that it can be reviewed by the Panel at the Panel meeting at which the relevant Modification Proposal is first to be considered.

This initial assessment provides a preliminary view on the following:

- the potential impact of the proposed modification on BSC Systems and processes;
- the potential impact of the proposed modification on other systems and processes used by Parties;
- the potential impact of the proposed modification on the BSC, Code Subsidiary Documents and Core Industry Documents;
- the potential impact of the proposed modification on ELEXON;
- the potential impact of the proposed modification on BSC financial arrangements & budget;
- the potential impact of the proposed modification on BSC Agent contractual arrangements;
- The process and timetable that should be adopted for the progression of the Modification Proposal, in light of its complexity, importance and urgency; and
- Issues that will need to be considered and addressed in progressing the Modification Proposal (including the potential need for impact assessments, consultation and analyses).

It should be noted that, as this document only represents a preliminary assessment of the Modification Proposal, the information contained herein will, in most cases, be superseded by the subsequent analysis and reports produced by the Modification Group to which the Panel assigns the proposal for consideration.

¹ see BSC F2.5

² see BSC F2.6

³ see BSC F2.3

⁴ see BSC F2.7

⁵ see BSC F2.1.8

3 DETAILS OF THE MODIFICATION PROPOSAL

A copy of the Modification Proposal form, as submitted by its Proposer, is attached as Annex 1 to this report.

The Modification proposes that transmission losses are allocated on a zonal basis, rather than on a uniform system-wide basis, by determining and applying locationally differentiated TLFs (i.e. TLF_{ij}). The TLFs would be calculated on a “marginal” basis. Currently, under section T2 of the BSC, TLFs for all BM Units in all Settlement Periods are set to zero.

The Modification suggests the following approach for the implementing zonal transmission losses:

- Actual demand and generation would be determined for all nodes on the system for each settlement period.
- A load flow model would be run to determine how a small increment of demand is met by a corresponding increase in generation, spread across all nodes.
- Nodal marginal loss TLFs would then be derived by repeating this process for each node.
- These would then be grouped into current TNUoS zones for generators and GSP groups for demand.
- The resulting zonal marginal TLFs would then be used to calculate Transmission Loss Multipliers under the existing section T2.3.1 of the BSC.
- There would be no scaling of the TLFs (a scheme proposed under the Pool recommended an attenuation factor that would have scaled down or muted the effect of zonal differentiation).
- The TLFs would be calculated on an ex-post basis.
- The TLFs would be produced and applied for each Settlement Period.
- The TLFM would be incorporated into the BSC, so that changes would only be possible through Modification Proposals.
- The calculation of TLFs would be undertaken by a new BSC Agent; the Transmission Loss Factor Agent (TLFA). Initially, however, the task could be undertaken by ELEXON, in-house, or by NGC.

4 IMPACT ON BSC SYSTEMS AND PROCESSES

BSC System / Process	Potential Impact of Proposed Modification
Registration	TLFA Systems may need to hold standing data to relate nodes to zones to BM Units.
Contract Notification	No impact identified
Credit Checking	No impact identified
Balancing Mechanism Activities	No impact identified
Collection and Aggregation of Metered Data	No impact identified
Supplier Volume Allocation	No impact identified
Settlement	<p>TLFA Systems will need to calculate TLFs, based on described methodology. These Systems will need to include a suitable load flow model.</p> <p>The SAA will also be impacted by the implementation of this Modification Proposal. It is expected that any Modification will be implemented on a Settlement Day basis and this will mean that Settlement Runs for days prior to the implementation date will utilise the existing calculations, and Settlement Runs for Settlement Days post implementation will use the Settlement calculations implemented under the Modification. This leads to a period of overlap in usage of two differing Settlement calculations which will have to be carefully managed.</p>
Clearing, Invoicing and Payment	No impact identified
Reporting	Some reporting of source data and resultant TLFs will be required. Estimated Transmission Loss Factors (ETLFs) may be required to produce indicative cash-out prices.
Dispute Resolution	No impact identified

5 IMPACT ON OTHER SYSTEMS AND PROCESSES USED BY PARTIES

System / Process	Potential Impact of Proposed Modification
Party Systems	Party systems will need to receive relevant reports associated with TLFs.
SO Systems	SO Systems may need to provide the TLFA service, at least in the interim.

6 IMPACT ON DOCUMENTATION

6.1 Impact on Balancing and Settlement Code

BSC Section	Potential Impact of Proposed Modification
A: Parties and Participation	No impact identified
B: The Panel	No impact identified
C: BSCCo and its Subsidiaries	No impact identified
D: BSC Cost Recovery and Participation Charges	No impact identified
E: BSC Agents	The introduction of the TLFA would need to be recognised
F: Modification Procedures	No impact identified
G: Contingencies	No impact identified
H: General	No impact identified
I: Not Used	No impact identified
J: Party Agents	No impact identified
K: Classification and Registration of Metering Systems and BM Units	No impact identified
L: Metering	No impact identified
M: Credit Cover and Credit Default	No impact identified
N: Clearing, Invoicing and Payment	No impact identified
O: Communications	No impact identified
P: Energy Contract Volumes and Metered Volume Reallocations	No impact identified

BSC Section	Potential Impact of Proposed Modification
Q: Balancing Mechanism Activities	No impact identified
R: Collection and Aggregation of Metered Data from CVA Metering Systems	No impact identified
S: Supplier Volume Allocation	No impact identified
S: ANNEX S-1 Performance Levels and Supplier Charges	No impact identified
S: ANNEX S-2 Supplier Volume Allocation Rules	No impact identified
T: Settlement and Trading Charges	The production and application of TLFs will need to be detailed. There may also be certain Panel decisions in respect of the choice of model and the choice of zones, etc.
U: Provisions Relating to Settlement	No impact identified
V: Reporting	TLF reporting and the use of ETLFs will need to be detailed
W: Trading Queries and Trading Disputes	No impact identified
X: Definitions and Interpretation	Certain intermediate forms of TLF may need to be defined, along with possible defined terms associated with the load flow model.
X: ANNEX X-1 General Glossary	No impact identified
X: ANNEX X-2 Technical Glossary	No impact identified

6.2 Impact on Code Subsidiary Documents

Code Subsidiary Document	Potential Impact of Proposed Modification
BSC Procedures	Changes to BSCP15 (Registration of BM Units) may be required
Codes of Practice	No impact identified
BSC Service Descriptions	A new Service Description will be required to cover the activities of the TLFA
Party Service Lines	No impact identified
Data Catalogues	The various intermediate forms of TLF will need to be recognised, as well as the ETLFs
Communication Requirements Documents	No impact identified
Reporting Catalogue	New TLF related reports will need to be detailed

7 IMPACT ON OTHER CONFIGURABLE ITEMS

Item	Potential Impact of Proposed Modification
BMRS Design Documentation	The URS and associated design documents will need to be amended to reflect the use of ETLFs.
New Design Documentation	A new suite of design documents will be required for the TLFA service

8 IMPACT ON ELEXON

Area of Business	Potential Impact of Proposed Modification
ELEXON Systems	No impact identified
ELEXON Procedures	No impact identified
ELEXON Contracts (Excluding BSC Agent Contracts)	A new BSC Agent contract will be required
Other (e.g. costs, staffing, etc.)	There may be some additional effort required to support Panel decision making, with regard to changes to TLF zones, load flow model parameters etc.

9 IMPACT ON FINANCIAL ARRANGEMENTS AND BUDGET

There will be a cost associated with the provision of a new BSC Agent service.

10 IMPACT BSC AGENT CONTRACTUAL ARRANGEMENTS

BSC Agent Contract	Potential Impact of Proposed Modification
Logica Consortium (BMRA, CRA, CDCA, SAA, ECVAA, TAA(CVA))	It may be necessary, depending on the approach taken, to procure raw data on nodal flows from the CDCA.
EPFAL (FAA)	No impact identified
ESIS (TAA(SVA))	No impact identified
Cap Gemini (SVAA)	No impact identified
PwC (BSC Auditor, Certification Agent)	There may be a need to extend the audit scope to cover the activities of the TLFA
EASL (Teleswitch Agent, Profile Administrator)	No impact identified

11 PROCESS AND TIMETABLE FOR PROGRESSING THE PROPOSAL

ELEXON recommends that this Modification is progressed through the Definition Procedure on the basis that the Modification itself makes it clear that the proposed elements of the solution are suggestions only. Group deliberation on these elements will be required to define the Modification in sufficient detail to enable assessment. Those aspects of the suggested solution that require further definition and deliberation are described in section 12.

Subsequently, the Panel may determine that an Assessment Procedure should also be undertaken. In addition to a consideration as to whether, or not, Applicable BSC Objectives are better achieved, the Assessment Procedure may need to involve the consideration of possible alternative approaches, some of which may be identified during the Definition Procedure.

11.1 Outline Timetable

The recommendation to provide the Definition Report to the Panel meeting to be held on May 16 2002 is based on the following suggested activities:

- An initial consultation to seek Party views on the Modification Proposal and the issues raised in the Initial Written Assessment (IWA).
- A first meeting of the Group to consider the Modification Proposal, the IWA and consultation responses. In particular, the Group will need to establish the details left undeveloped in the suggested methodology for producing and applying TLFs.
- A second meeting of the Group to finalise the Definition Report.

11.2 Modification Group Terms of Reference

It is proposed that the Group's terms of reference, include:

- i) the examination of the Modification Proposal;
- ii) consideration of the issues raised in the Initial Written Assessment;
- iii) detailing a TLFM; and
- iv) consultation on the issues raised in the IWA and the level of support for Modification Proposal.

The terms of reference should specify that, given that the Group is undertaking a Definition Procedure, the consideration of the various issues associated with the Modification should be limited to determining a consistent and complete definition. The choice between various options should await any Assessment Procedure that the Panel may subsequently require.

ELEXON suggest that a new Modification Group is established, based on those who have particular expertise in the area of transmission losses. It is felt that the nature of the Modification does not lend itself to consideration by any of the established groups. A request inviting relevant experts to register their interest in becoming part of the new Modification Group has already been sent out..

12 ISSUES

Although the Modification Proposal is not prescriptive in the way in which the perceived defect is addressed, a particular approach I suggested. It is therefore proposed that this approach should provide the focus for the Definition Procedure.

Addressing the following key issues would help establish a sufficiently detailed Modification Proposal:

1. TLF Production:

- The Modification suggests that demand and generation values be established, on an ex-post basis for all nodes on the System.
- The Modification suggests that a 'Load Flow Model' should be run to establish TLFs, based on increments of demand at a node being met by increments of generation spread over all nodes. The Group will need to consider this approach and the extent to which such a Load Flow Model would need to be specified (at the very least, the principal characteristics and requirements will need to be defined). In addition, the basis of the network configuration for such an approach would need to be established. Consideration would also need to be given as to how frequently the Load Flow analysis should be undertaken (i.e. for a given dataset and network configuration, what is the applicable timescale for calculation of the resultant TLFs?). If the same values of TLFs are to prevail for more than one settlement period, the averaging approach will need to be considered.
- The Modification suggests that the resultant nodal marginal TLFs could be grouped together into current TNUoS zones for generation and into GSP Groups for demand. The Group will need to consider the most appropriate zonal groupings. Consideration will need to be given as to how such zones might need to change, in the future, and how to distinguish production from consumption BM Units, if generation zones are to differ from demand zones. There will also need to be some consideration as to how the averaging process should be undertaken, in terms of converting nodal to zonal values.

2. TLF Application:

- The Modification suggests that the resultant zonal, marginal TLFs should be submitted into the SAA calculations as soon as is practical, preferably in time for the Initial Settlement Run.
- The Group will need to consider whether there should be no scaling of the TLFs and whether the correct recovery of losses, in each settlement period, would be ensured through the use of the Transmission Loss Adjustments (ETLMO+j and ETLMO-j).

3. Reporting:

- The Group will need to consider the reporting of the proposed TLFA.
- The Group will also need to consider whether the use of Estimated Transmission Loss Factors (ETLFs) is required for use in producing Indicative prices on the BMRS. If so, the approach to producing these ETLFs will need to be considered.

Annex 1 – Modification Proposal – P075

Modification Proposal	MP No: 75 <i>(mandatory by BSCCo)</i>
Title of Modification Proposal <i>(mandatory by proposer):</i> Introduction Of Zonal Transmission Losses	
Submission Date <i>(mandatory by proposer):</i> 5 April 2002	
<p>Description of Proposed Modification <i>(mandatory by proposer):</i></p> <p>The modification proposes that transmission losses are allocated on a zonal rather than on a uniform system wide basis. Currently under Section T2 of the BSC, Transmission Loss Factors (TLF_{ij}) for all BMUs in all settlement periods are set to zero.</p> <p>It is proposed that a Transmission Loss Factor Agent (TLFA) be appointed to calculate zonal marginal TLFs for each BMU in a given settlement period. Initially NGC would fulfil this role, however BSCCo could, in principle, choose to carry out this activity in-house or procure such a service from a third party other than NGC. TLFs would be calculated in accordance with the Transmission Loss Factor Methodology (TLFM), which would be set out in detail under the BSC. The methodology for deriving TLFs would be a marginal loss approach the exact form of which would be defined by the Modification Group. A suggested approach is summarised as follows:</p> <ul style="list-style-type: none"> • Demand and generation would be determined for all nodes on the system for each settlement period on an ex post basis. • A load flow model would be run to determine how a small increment of demand is met by a suitable increase in generation spread across all nodes. • Nodal marginal loss factors would then be derived by repeating this process for each node. • These would then be grouped into the current TNUoS zones for generators and GSP Groups for demand. <i>(The Modification Group may wish to consider whether other zonal groupings are more appropriate).</i> • The resulting zonal marginal TLF data would be submitted to BSCCo by the TLFA as soon as practicable and preferably in time for the Initial Settlement Run. There would be no scaling of these factors. • Transmission Loss Multipliers (TLMs) would then be calculated in accordance with Section T2.3.1 of the BSC. <p>Although this proposal preserves the full marginal loss signals from the network modelling, adjustments (TLMO⁺_i and TLMO⁻_i) under T2.3.1 ensure Transmission Loss Multipliers (TLM_{ij}) recover the correct volume of total system losses in each settlement period. In addition, to ensure suppliers can manage the customer billing implications of this proposal implementation before 1 April 2003 is <u>not</u> advised.</p> <p><u>Governance of future changes to Transmission Loss Factor Methodology (TLFM)</u></p> <p>Given the commercial importance of transmission losses, changes to TLFM would only be permitted by means of a modification proposal. As such changes could only be proposed according to the 'normal' modification rules by energywatch, market participants or NGC. This together with incorporation of the TLFM within the BSC will ensure a rigorous appraisal of any future proposed changes to the losses regime.</p>	

Modification Proposal	MP No: 75 <i>(mandatory by BSCCo)</i>
Description of Issue or Defect that Modification Proposal Seeks to Address <i>(mandatory by proposer):</i> Currently the cost of transmission losses is not accurately targeted at BSC Parties that are to a greater or lesser extent contributing to those losses. The proposal addresses this defect. By introducing a zonal differentiation in the allocation of losses the proposal will provide appropriate locational signals to parties which will help reduce overall transmission losses in the short-term and encourage more optimal siting of generation and demand in the longer-term. Adoption of a marginal approach ensures that robust economic signals are provided to relevant users. The current uniform approach to allocation of transmission losses fails to provide appropriate cost signals. It effectively provides hidden cross-subsidies for northern generation and southern demand, whilst unfairly placing additional costs on southern generation and northern demand. The industry has been aware of this long-standing distortion at the heart of electricity trading arrangements, from the inception of the England and Wales Electricity Pool. Indeed OFFER in its 1989 Annual Report stated that there should be locational pricing for the use of NGC's transmission system and made it clear that it envisaged transmission losses should include locational signals. In 1997 the Pool Executive Committee approved a scheme for the zonal allocation of the cost of transmission losses. Although the project was shelved in the run up to NETA, Ofgem made clear that the issue would be revisited after NETA implementation. The subject has also been discussed at length in various Ofgem Transmission Access and Losses consultation documents dated December 1999, May 2001 and February 2002.	
Impact on Code <i>(optional by proposer):</i> Changes to Section T2 of the BSC.	
Impact on Core Industry Documents <i>(optional by proposer):</i> Not known.	
Impact on BSC Systems and Other Relevant Systems and Processes Used by Parties <i>(optional by proposer):</i> Likely to impact on supplier's customer billing systems.	
Impact on other Configurable Items <i>(optional by proposer):</i>	
Justification for Proposed Modification with Reference to Applicable BSC Objectives <i>(mandatory by proposer):</i> The proposal more accurately targets the cost of transmission losses. In so doing it removes the cross-subsidies inherent in the current method for allocation of transmission losses between BSC participants, and hence helps ensure effective competition in the generation and supply of electricity. The short-term effects are likely to be a reduction in the overall cost of system losses, although the longer-term efficiency gains in terms of influencing the locational patterns of generation and supply are likely to be more significant. Overall, this should assist the Transmission Company in the efficient, economic and co-ordinated operation of the Transmission System.	

Modification Proposal	MP No: 75 <i>(mandatory by BSCCo)</i>
Details of Proposer: Name: Peter Bolitho Organisation: Powergen UK plc Telephone Number: 024 7642 5441 Email Address: peter.bolitho@pgen.com	
Details of Proposer's Representative: Name: Peter Bolitho Organisation: Powergen UK plc Telephone Number: 024 7642 5441 Email Address: peter.bolitho@pgen.com	
Details of Representative's Alternate: Name: Paul Jones Organisation: Powergen UK plc Telephone Number: 024 7642 4829 Email Address: paul.jones@pgen.com	
Attachments:	No