REQUIREMENTS SPECIFICATION for Proposed Modification P200
'Introduction of a Zonal Transmission Losses Scheme with Transitional Scheme'

Prepared by: P200 Modification Group

Date of Issue:	18 May 2006	**Document Reference:**	P200AS
Reason for Issue:	For Impact Assessment	**Version Number:**	1.0

Proposed Modification P200 seeks to allocate the 'variable' element of transmission losses to BSC Parties on a 'zonal' basis through the Transmission Loss Factor (TLF). The proposed methodology for the calculation of these 'zonal' TLFs is consistent with that set out in the Requirements Specification for Proposed Modification P198 (Reference 1). In addition to replicating the P198 requirements, P200 seeks to mitigate the impact of these zonal TLFs through a transitional 'hedging' scheme. The hedging scheme would be applied to a fixed volume of energy (the 'F-factor') for qualifying 'generator' BM Units, allowing the retention of a non-zonal share of transmission losses for that energy volume over a period of 15 years from the date of the Authority's approval of P200.

BACKGROUND AND PURPOSE OF IMPACT ASSESSMENT

The BSC Panel considered P200 at its meeting on 11 May 2006 and submitted the proposal to a 3-month Assessment Procedure, to be conducted by the P200 Modification Group (formed from members of the P198 Modification Group). The P200 Modification Group ('the Group') has met once to date on 12 May 2006 and agreed the solution requirements for the Proposed Modification.

This document sets out the requirements agreed by the Group, and supports impact assessment by BSC Agents, BSC Parties, the Transmission Company and BSCCo.[1] It focuses on the transitional hedging scheme element of P200, which is additional to the functionality of zonal TLFs proposed under P198. Therefore, respondents are requested to only identify any impacts or lead time arising from Proposed Modification P200 which are additional to those already identified for Proposed Modification P198. Copies of the non-confidential Party/Party Agent impact assessment responses received for Proposed Modification P198 can be found on the BSC Website (Reference 2).

Respondents are invited to provide cost information to support their impact assessments. Where requested this information can be treated as confidential, although all information will be provided to the Authority. Respondents should therefore clearly indicate if any aspect of their response is confidential.

Any queries regarding the impact assessment requirements should be addressed to Kathryn Coffin (020 7380 4030), e-mail address kathryn.coffin@elexon.co.uk.

---

[1] The Balancing and Settlement Code Company (ELEXON).

CONTENTS TABLE

SUMMARY OF IMPACTED PARTIES AND DOCUMENTS

As far as the Modification Group has been able to assess, the following parties/documents would be impacted by P200.

Please note that this table represents a summary of the initial impact assessment contained in Section 5.

Parties		Sections of the BSC		Code Subsidiary Documents	
Distribution System Operators	☒	A	☐	BSC Procedures	☒
Generators	☒	B	☐	Codes of Practice	☐
Interconnectors	☒	C	☐	BSC Service Descriptions	☒
Licence Exemptable Generators	☒	D	☐	Party Service Lines	☐
Non-Physical Traders	☒	E	☒	Data Catalogues	☒
Suppliers	☒	F	☐	Communication Requirements Documents	☒
Transmission Company	☒	G	☐	Reporting Catalogue	☒
Party Agents		H	☒	Load Flow Model Specification*	☒
Data Aggregators	☐	I	☐	**Core Industry Documents**	
Data Collectors	☐	J	☐	Ancillary Services Agreement	☐
Meter Administrators	☐	K	☐	British Grid Systems Agreement	☐
Meter Operator Agents	☐	L	☐	Data Transfer Services Agreement	☐
ECVNA	☐	M	☐	Distribution Codes	☐
MVRNA	☐	N	☐	Distribution Connection Agreements	☐
BSC Agents		O	☐	Distribution Use of System Agreements	☐
SAA	☒	P	☐	Grid Code	☐
FAA	☐	Q	☐	Master Registration Agreement	☐
BMRA	☒	R	☐	Supplemental Agreements	☐
ECVAA	☐	S	☐	Use of Interconnector Agreement	☐
CDCA	☒	T	☒	**BSCCo**	
TAA	☐	U	☐	Internal Working Procedures	☒
CRA	☒	V	☒	**BSC Panel/Panel Committees**	
SVAA	☐	W	☐	Working Practices	☒
Teleswitch Agent	☐	X	☒	**Other**	
BSC Auditor	☒			Market Index Data Provider	☐
Profile Administrator	☐			Market Index Definition Statement	☐
Certification Agent	☐			System Operator-Transmission Owner Code	☐
Transmission Loss Factor Agent*	☒			Transmission Licence	☐
Other Agents				Network Mapping Statement*	☒
Supplier Meter Registration Agent	☐			Load Flow Model Reviewer*	☒
Data Transfer Service Provider	☐				

*New document/role introduced by P200

1   BACKGROUND

1.1.1   Existing Allocation Mechanism for Transmission Losses

The total metered energy which can be drawn from the Transmission System to meet demand will always be less than that delivered onto the Transmission System by generation, since some energy is used up in the process of transporting electricity. As part of the calculation of BSC Parties' Trading Charges, Section T2 of the Balancing and Settlement Code ('the Code') adjusts individual BM Unit Metered Volumes in Settlement to account for these 'transmission losses' – i.e. it allocates the 'lost' energy to ensure that total adjusted generation matches total adjusted demand in any given Settlement Period.

A Transmission Loss Multiplier (TLM) is used to scale each BM Unit's Metered Volumes:

$$TLM = 1 + TLF + TLMO^{+/-}$$

The Transmission Loss Factor (TLF) is currently set to zero, and can only be amended via a modification to the Code. The purpose of the Transmission Losses Adjustment (TLMO) is to ensure that there is no over- or under-recovery of transmission losses in any half-hour Settlement Period, by uniformly allocating the proportion of transmission losses in that half hour which has not already been allocated via the TLF. 45% of the total transmission losses in each Settlement Period are allocated to delivering Trading Units in aggregate (through the $TLMO^{+}$) and 55% to offtaking Trading Units in aggregate (through the $TLMO^{-}$). Since the TLF is set to zero, all transmission losses are therefore currently allocated to BM Units on a uniform basis.

The formulae below represent simplified versions of the $TLMO^{+}$ and $TLMO^{-}$ calculations. The precise Section T calculations are provided in Appendix 2 for information.

$TLMO^{+}$ = (0.45*(total transmission losses in Settlement Period) – delivering Trading Units' share of transmission losses already allocated through TLF in Settlement Period) / total volume of delivery in Settlement Period

TLMO- = (0.55*(total transmission losses in Settlement Period) – offtaking Trading Units' share of transmission losses already allocated through TLF in Settlement Period) / total volume of offtake in Settlement Period

1.1.2   Modification Proposal P198

Modification Proposal P198 'Introduction of a Zonal Transmission Losses Scheme' was raised by RWE Npower on 16 December 2005. P198 seeks to allocate the 'variable' element of transmission losses to BM Units on a non-uniform locational basis through the TLF, according to the extent to which each BM Unit is estimated to contribute to such losses.   Each BM Unit would receive a 'zonal' TLF value determined according to the Grid Supply Point (GSP) Group in which it was geographically located. A positive TLF value would be produced for a Zone in which an incremental increase in generation (or reduction in demand) had the effect of decreasing total transmission losses, and would increase the value of TLM used to scale the Metered Volumes of BM Units within this Zone (a benefit to generators and disadvantage to Suppliers). A negative TLF value would be produced for a Zone in which an incremental increase in generation (or reduction in demand) had the effect of increasing total transmission losses, and would decrease the value of TLM for BM Units within this Zone (a benefit to Suppliers and disadvantage to generators). P198 would retain a uniform 45:55 allocation of the remaining transmission losses to delivering and offtaking Trading Units through the TLMO. Further information can be found in the Requirements Specification for P198 (Reference 1).

1.1.3   Modification Proposal P200

P200 'Introduction of a Zonal Transmission Losses Scheme with Transitional Scheme' was raised on 21 April 2006 by Teesside Power Limited, part-way through the Assessment Procedure for P198. P200 seeks to introduce zonal TLFs calculated under the same methodology as P198, but proposes a different application of these TLFs in Settlement. It aims to apply a 'transitional hedging scheme' to mitigate the impact of the zonal TLFs on existing generators over 15 years, by retaining a non-zonal allocation of transmission losses for a fixed level of output (the 'F-factor') and allocating a zonal TLF only to any variation from this output. In addition to the calculation of zonal TLFs under the P198 methodology, P200 would introduce new Code calculations for F-factor volumes and the non-zonal transmission losses that the F-factors would receive.

Proposed Modification P200 can be considered to represent 'Proposed Modification P198 + transitional hedging scheme', as shown in the table below.

Aspect of Solution	P198 Proposed	P200 Proposed
Scope of Zonal TLF Calculation	Scaled Marginal (Variable Losses Only)	Scaled Marginal (Variable Losses Only)
Applicable Period for Zonal TLFs	BSC Year	BSC Year
Nature of TLF Calculation	Ex-Ante	Ex-Ante
Applicable Zones for Production BM Units	GSP Group	GSP Group
Applicable Zones for Consumption BM Units	GSP Group	GSP Group
Mitigation of Impacts	None	Hedging for Fixed Volumes
Period of Mitigation	None	15 Years from Authority Decision to Approve P200

2   SCOPE OF PROPOSED MODIFICATION SOLUTION

Proposed Modification P200 is based on the zonal transmission losses scheme being developed for Proposed Modification P198, with the addition of a transitional hedging scheme. The solution requirements for the calculation of zonal TLFs under Proposed Modification P200 are therefore identical to those set out in the Requirements Specification for Proposed Modification P198, and the remainder of this Requirements Specification is limited to the additional requirements for the transitional hedging scheme element of Proposed Modification P200. Respondents to the impact assessment are requested to only identify any impacts or lead time arising from Proposed Modification P200 which are additional to those already identified for Proposed Modification P198. Copies of the non-confidential Party/Party Agent impact assessment responses received for Proposed Modification P198 can be found on the BSC Website (Reference 2).

3   SUMMARY OF PROPOSED MODIFICATION HEDGING SCHEME REQUIREMENTS

3.1   Key Features of Proposed Modification Transitional Hedging Scheme

The key features of the transitional hedging scheme element of Proposed Modification P200 are set out below:

a) The transitional hedging scheme under Proposed Modification P200 applies only to certain existing 'generator' BM Units (each a 'Qualifying BM Unit'). Two different sets of qualifying criteria are currently being considered by the Group as set out in Section 4.1.

b) Proposed Modification P200 calculates a set of 12 monthly 'F-factor' volumes of electricity (in MWh) for each Qualifying BM Unit, representing an average level of generation in each calendar month over a historic 'Baseline Period'. Two different methodologies for the calculation of monthly F-factors are being considered by the Group. Details of the Baseline Period and these F-factor calculation options can be found in Section 4.2.

c) Proposed Modification P200 allocates to the F-factor volume of Qualifying BM Units a share of transmission losses on a non-zonal basis (calculated in the same way as the current TLMO$^+$ with a zero TLF) to the F-factor volume. The effect of this mechanism is that the zonal TLF only applies to the difference between the BM Unit's F-factor volume and actual Metered Volume in a given Settlement Period. If the difference is positive, the additional output receives the prevailing zonal TLF applicable to the BM Unit (subject to adjustment through the calculation of TLM). If the difference is negative, the reduction in output sees the difference between the zonal and the non-zonal TLFs. Details of the calculation for these 'hedged losses' can be found in Section 4.5.

d) Proposed Modification P200 fixes the 12 monthly 'F-factor' volumes for each Qualifying BM Unit for 15 years from the date of the Authority's approval of P200. Details regarding the treatment of F-factors under the Code's BM Unit deregistration, re-registration and Change of BM Unit Ownership (CoBo) processes can be found in Section 4.1.

Those BM Units which did not qualify for the transitional hedging scheme under Proposed Modification P200 would receive a full (non-mitigated) zonal TLF as consistent with P198.

3.2   Example TLF Allocation Under Proposed Modification

Currently all transmission losses are allocated to Metered Volumes via a multiplier (the TLM), which contains other multipliers (TLF and TLMO). However, Proposed Modification P200 would apply a uniform loss allocation to the F-factor volume, regardless of a BM Unit's actual Metered Volumes in any Settlement Period.

Any remaining difference between the transmission losses allocated to BM Units through zonal TLFs/hedged losses and the actual level of total losses in a given Settlement Period would continue to be allocated via the TLMO, according to the 45:55 split between delivering and offtaking Trading Units.

Since the losses hedging would apply to a fixed volume of energy, rather than a multiplier, it would be possible for a generator whose actual output was zero to be allocated transmission losses under Proposed Modification P200. This is in contrast to both the existing TLM calculation and P198's non-hedged application of zonal TLFs, where applying a multiplier to a zero Metered Volume would give a zero allocation of losses.

The following graph seeks to illustrate at a high level how the principle of F-factor hedging under Proposed Modification P200 could affect a Qualifying BM Unit's transmission losses allocation, using as an example a BM Unit with an F-factor of 100MWh in four different Settlement Periods (see Proposer's additional diagram in Appendix 1 for further clarification).
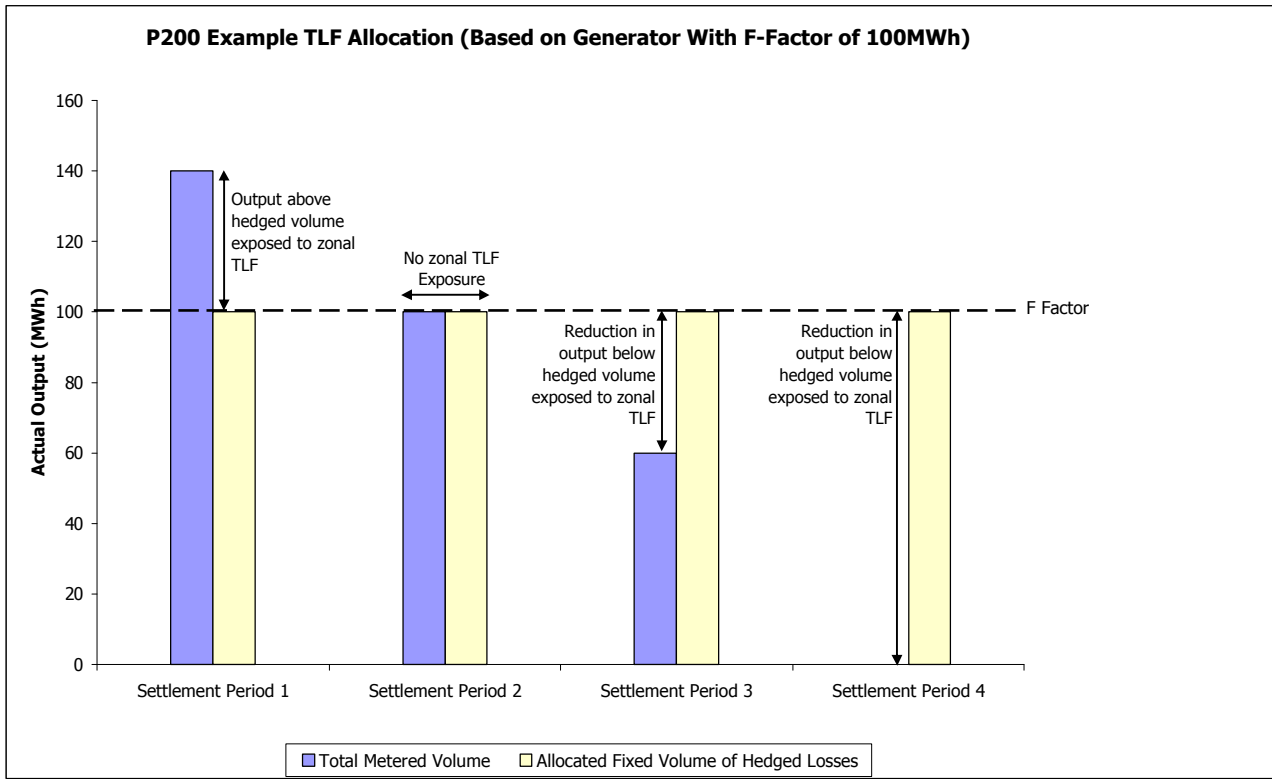
Note that example Settlement Period 4 represents a more extreme version of Settlement Period 3, where the generator's output is zero due to an outage.

The remaining zonal TLF exposure in example Settlement Periods 1, 3 and 4 could be either a benefit or disbenefit for the Qualifying BM Unit, depending on whether it was subject to a positive or negative zonal TLF.

4   DETAIL OF ADDITIONAL PROPOSED MODIFICATION HEDGING SCHEME REQUIREMENTS

In addition to the solution requirements for Proposed Modification P198, Proposed Modification P200 requires:

1) A one-off determination of Qualifying BM Units (impacting BSCCo);

2) A one-off calculation of F-factor volumes for Qualifying BM Units (impacting BSCCo);

3) A one-off change to BSC Systems to add F-factors for all BM Units as a new parameter within BM Unit registration data (impacting the Central Registration Agent); and

4) The ongoing calculation of a uniform loss allocation for F-factor volumes for Qualifying BM Units in Settlement (impacting the Settlement Administration Agent and the Balancing Mechanism Reporting Agent).

4.1 Determination of Qualifying BM Units

BSCCo would be responsible for undertaking a one-off determination of Qualifying BM Units, prior to the calculation of the F-factor volumes which would apply in Settlement from the Implementation Date for Proposed Modification P200. As part of the BSCCo impact assessment, estimates are therefore sought regarding the lead time and man effort which would be required to undertake this determination.

Two possible sets of criteria are being considered by the Group for determining which BM Units would qualify for the transitional hedging scheme under Proposed Modification P200. Estimates are therefore sought as to whether the choice between these criteria would affect the required lead time and effort. In addition, confirmation is sought as to whether the data required to apply these criteria could be obtained by BSCCo via its Trading Operations Market Analysis System (TOMAS), or would need to be obtained from BSC Agents.

4.1.1 Criteria Set 1 – Eligibility Based on BM Unit Behaviour

To qualify for the transitional hedging scheme, BM Units would be required to:

a) Be a BM Unit which, as of the end date of the Qualifying Period, was comprised only CVA Metering Systems (this would include Interconnector BM Units); and

b) Have a net BM Unit Metered Volume (QM) over a specified Qualifying Period which was positive and greater than zero (i.e. was net export).

This approach would therefore exclude the following:

- BM Units which were registered as Supplier BM Units on or after the end date of the Qualifying Period;

- BM Units which comprised only CVA Metering Systems on the end date of the Qualifying Period, but which had either a net negative QM (i.e. were net import) or a zero QM (i.e. had equal volumes of export and import) over the Qualifying Period;

- BM Units which were registered as Supplier BM Units on the end date of the Qualifying Period, but which subsequently registered as a BM Unit comprising only CVA Metering Systems after this date; and

- New BM Units comprising only CVA Metering Systems which registered after the end of the Qualifying Period.

These non-qualifying BM Units would therefore be exposed to full (non-mitigated) zonal TLFs, consistent with P198.

Since there are separate Production and Consumption Interconnector BM Units, only Production Interconnector BM Units with a net export which was positive and greater than zero over the Qualifying Period would be eligible for the scheme.

Where a BM Unit had not been registered during particular Settlement Periods of the Qualifying Period, its Metered Volume (QM_{ij}) would be counted as zero for those Settlement Periods.

4.1.2 Criteria Set 2 – Eligibility Based on Trading Unit Behaviour

Qualifying BM Units would be required to :

a) Be part of a Trading Unit which, on the end date of the Qualifying Period, was not registered as a Base Trading Unit (i.e. which did not include Supplier BM Units); and

b) Be part of a Trading Unit whose net aggregate Metered Volume over the Qualifying Period was positive and greater than zero (i.e. which was net export).

Trading Units which fulfilled both of these criteria would be 'Qualifying' Trading Units. All BM Units belonging to a Qualifying Trading Unit would be Qualifying BM Units under the transitional hedging scheme.

This approach would therefore include BM Units with a net import over the Qualifying Period if they were part of a Trading Unit which was not a Base Trading Unit and which had a net export over the period. It would exclude:

- BM Units registered as part of a Base Trading Unit on or after the end date of the Qualifying Period;

- BM Units which were part of a Base Trading Unit on the end date of the Qualifying Period but which subsequently became part of a non-Base Trading Unit;

- BM Units with a net export over the Qualifying Period if they were part of a Trading Unit whose net aggregate Metered Volume was either net import or zero over the Qualifying Period; and

- BM Units which registered in a non-Base Trading Unit after the end of the Qualifying Period.

Under this approach, both Production and Consumption Interconnector BM Units would qualify for the transitional hedging scheme if they were part of a Trading Unit which was net export over the Qualifying Period.

Where a Trading Unit had not been registered during particular Settlement Periods within the Qualifying Period, its net aggregate Metered Volume would be counted as zero for those Settlement Periods.

4.1.3 Qualifying Period

Two options are being considered by the Group for the Qualifying Period as follows:

i) 1 April 2005 – 31 March 2006; or

ii) The 12 months prior to the Authority's approval of P200.

Note that approach i) would effectively exclude from the hedging scheme any BM Units which registered after 1 April 2006 (even if they registered before the date of the Authority's approval of Proposed Modification P200).

4.1.4 Retrospective Changes to Qualifying Status

The Group has not yet determined whether Parties would be able to appeal BSCCo's determination regarding their eligibility for the transitional hedging scheme under Proposed Modification P200. In the absence of a formal appeals process, the eligibility of a BM Unit for the scheme would only change following BSCCo's original determination in the circumstances set out below.

a) Dispute over Qualifying Status

If a Party believed that BSCCo had incorrectly established its eligibility for the scheme it would be entitled to raise a Trading Query under the normal Disputes process. Parties would only be able to dispute the accuracy of BSCCo's determination of eligibility based on the data which was available at the time that the determination took place. Any subsequent changes to the data used in the Qualifying Period which arose from the adjustment of metered data under the normal Settlement process would not result in retrospective qualification for the scheme, since this would not represent a Settlement error. If the Trading Disputes Committee determined that BSCCo had incorrectly established the eligibility of a BM Unit based on the original Qualifying Period data, the BM Unit concerned would be deemed qualified or disqualified as appropriate and its F-factor would be accordingly recalculated or set to zero.

b) Change in BM Unit Registration

Under both Criteria Sets 1 and 2, if a Qualifying BM Unit subsequently became a Supplier BM Unit after the end of the Qualifying Period, it would no longer qualify for the transitional hedging scheme and its F-factor would be set to zero (or would cease to exist if the BM Unit became part of an SVA Base BM Unit).

If a Party deregistered a Qualifying BM Unit part-way through the 15-year duration of the F-factor for that BM Unit, the F-factor would automatically cease to exist from the point of the BM Unit's deregistration (i.e. the deregistration date would override the previous 15-year end date of the F-factor). The Group is currently considering potential ways of preventing a Party from leaving the hedging scheme early by deregistering and registering a BM Unit at the same site during the 15-year duration of F-factors.

Note that if the ownership of a BM Unit was transferred to another Party via the CoBo process, the qualifying status of that BM Unit would not change as long as it did not become a Supplier BM Unit – since the ownership of the F-factor would be transferred as an attribute of that BM Unit. The end-date of the BM Unit's F-factor would continue to be 15 years from the date of the Authority's approval of P200.

4.2 Calculation of F-Factors

BSCCo would be responsible for undertaking a one-off calculation of F-factor volumes for the Qualifying BM Units, to be undertaken prior to the Implementation Date for Proposed Modification P200 (i.e. prior to the date on which the new zonal TLFs/F-factors were first used in Settlement). All non-qualifying BM Units would automatically receive F-factor volumes of zero, and there would therefore be no requirement for BSC Systems to contain a flag to record which BM Units qualified for the hedging scheme.

As part of the BSCCo impact assessment, estimates are sought regarding the lead time and man effort which would be required to undertake this calculation. In addition, confirmation is sought as to whether the data required for the calculation could be obtained by BSCCo via TOMAS, or would need to be obtained from BSC Agents.

4.2.1 Baseline Period for F-Factor Calculation

F-factors would be calculated using data from a historic Baseline Period.

The Group is currently considering 3 potential options for the Baseline Period as follows:

- 1 April 2005 – 31 March 2006;

- Multiples of 12 months beginning 1 April 2005 (i.e. as many full years of GB BSC data as is available prior to the point at which F-factors would need to be calculated, for example 1 April 2005 – 31 March 2007 for a 1 October 2007 implementation); or

- The 12 months prior to the Authority's approval of Proposed Modification P200.

Note that the duration of the Qualifying Period and Baseline Period would therefore not necessarily be the same.

As part of the BSCCo impact assessment, estimates are sought as to whether the choice between these 3 options would affect the lead time and man effort required to undertake the F-factor calculation.

4.2.2 Granularity of F-Factors

Each Qualifying BM Unit would receive a set of 12 F-factor values, one for each calendar month of the year, some or all of which would be non-zero. Non-qualifying BM Units would receive a set of 12 zero values.

4.2.3 F-Factor Calculation

Two options are being considered by the Group for the calculation of F-factors, as set out below. As part of the BSCCo impact assessment, estimates are sought as to whether the choice between these two options would affect the lead time and man effort required to undertake the F-factor calculation.

Note that under both approaches there could be circumstances where a Qualifying BM Unit deregisters or becomes a Supplier BM Unit (and therefore became ineligible for the scheme) between the calculation of F-factors and their first application in Settlement on the Implementation Date. BSCCo and the CRA would therefore need to establish a process to deal with this eventuality.

a) Calculation Approach 1 – F-Factors Based on BM Unit Behaviour

This approach would be followed if qualification for the transitional hedging scheme was based on BM Unit behaviour (i.e. Criteria Set 1 in Section 4.1). F-factors would be MWh values, applied at the Qualifying BM Unit level in each Settlement Period and based on historic BM Unit Metered Volumes during the Baseline Period (averaged over a month).

The monthly F-factor for each BM Unit would be calculated as a simple average (arithmetic mean) of the BM Unit's Metered Volumes in that month within the historic Baseline Period data (e.g. data for January in the Baseline Period would be used to calculate the January F-factor and so on).

Note that the calculation of F-factors for Qualifying Interconnector BM Units would be the same as for any other Qualifying BM Unit.

Calculation Using One Year's Baseline Period Data

If only one year's worth of data was used for the Baseline Period, the BM Unit would receive a zero F-factor for any month where it had either a zero Metered Volume (for example, where it had been on outage) or where the BM Unit had not been registered and therefore had no data available.

Although a BM Unit may have been net export over a year in the Qualifying Period, in a particular month within the Baseline Period it may have been net import. In such circumstances, the BM Unit would receive a zero F-factor for that month (i.e. there would be no potential for negative F-factors).

The following table gives an illustrative example of this approach:

	Qualifying BM Unit's Average QM (MWh)	Qualifying BM Unit's F-Factor (MWh)
Calendar Month 1	Data Unavailable – BM Unit not registered	Zero
Calendar Month 2	Zero (on outage)	Zero
Calendar Month 3	100	100
Calendar Month 4	-100	Zero

Calculation Using Two or More Years' Baseline Period Data

Where more than one year's data was used for the Baseline Period, the simple average of the combined Metered Volume in the same calendar months would be used where data was available for this month in all years. For example, if two years' data was used, a simple average of the combined data for the two Januarys in the different years would be used to calculate the January F-factor for a BM Unit. If the BM Unit had a zero average Metered Volume in the January of one year (due to an outage) but a positive average Metered Volume in the January of the other year, its F-factor would represent the average of these two values.

However, where data was not available for a month in some years within the Baseline Period but was available in others (for example, where a BM Unit had only registered part-way through the Baseline Period) the F-factor would be calculated using only the months where data was available.

Although a BM Unit may have been net export over a year in the Qualifying Period, in a particular month within the Baseline Period it may have been net import. In such circumstances, the BM Unit would receive a zero F-factor for that month (i.e. there would be no potential for negative F-factors).

The following table gives a worked example of this approach:

	Qualifying BM Unit's Average QM in Year 1 (MWh)	Qualifying BM Unit's Average QM in Year 2 (MWh)	Qualifying BM Unit's F-Factor (MWh)
Calendar Month 1	Data Unavailable – BM Unit not registered	100	100
Calendar Month 2	Zero (on outage)	100	50
Calendar Month 3	100	200	150
Calendar Month 4	-100	-100	Zero
Calendar Month 5	-100	100	Zero
Calendar Month 6	-100	200	100

b) Calculation Approach 2 – F-Factors Based on Trading Unit Behaviour

This approach would be followed if qualification for the transitional hedging scheme was based on Trading Unit behaviour (i.e. Criteria Set 2 in Section 4.1). F-factors would be MWh values, applied at the Qualifying BM Unit level but based on historic Metered Volumes at the Trading Unit level during the Baseline Period.

The Group is currently considering the most appropriate methodology for this calculation. At a simple level, the approach would be as follows:

i)   Calculate the aggregate net QM of each Qualifying Trading Unit in each calendar month (i.e. the summation of the net monthly QM of each BM Unit in each Qualifying Trading Unit);

ii) Create a set of 12 monthly F-factor values for the Qualifying Trading Unit which are equal to its aggregate net QM calculated above;

iii) Pro-rata this monthly F-factor across all BM Units in a Trading Unit which have a net positive monthly QM (so that their share of the F-factor is proportionate to their QM), and allocate a zero monthly F-factor to any BM Units which have a negative monthly QM.

There would be no special treatment for Interconnector BM Units.

The Group has yet to agree how the following circumstances would be treated under this approach:

• BM Units which changed Trading Units part-way through the Baseline Period;

• BM Units which were only registered in the Trading Unit for part of the Baseline Period; and

• Trading Units which were not registered for all months/years of the Baseline Period.

4.3   Publication of F-Factors

BSCCo would be required to publish the 12 monthly F-factors for every BM Unit on the BSC Website. BSCCo may also wish to develop and publish an information sheet describing the calculation and use of F-factors, although this would not be a Code requirement. It is anticipated that this would form part of the same information sheet produced to explain the new zonal TLF calculation. As part of the BSCCo impact assessment, estimates are sought regarding the timescales and effort which would be required to publish this information (including any required changes to BSC Website content and functionality).

Parties responding to the impact assessment are also requested to indicate the lead time (if any) that they would require between the publication of F-factor values and the first use of F-factors in Settlement on the Implementation Date.

4.4   Registration of F-Factors in BSC Systems

BSCCo would be responsible for sending F-factors to the CRA for registration against Qualifying BM Units. A one-off change to CRA systems would be required in order to introduce the F-factor as a new parameter within BM Unit registration data. All BM Units would receive 12 F-factors (one per calendar month), some or all of which might be zero. All F-factors would receive an end-date of 15 years from the date of the Authority's approval of Proposed Modification P200 (the duration of the hedging scheme). Note that F-factors would always be either a zero or positive value.

As part of the BSCCo and BSC Agent impact assessments, estimates are sought regarding the lead time and effort required to undertake this one-off registration exercise. Any new BM Units registered after the initial population of F-factors in BSC Systems would receive a set of 12 zero F-factors, since they would not qualify for the scheme.

The treatment of F-factors under a BM Unit deregistration, re-registration or CoBo is detailed separately in Section 4.1.

The CRA would be responsible for reporting the F-factor values for each BM Unit to the BMRA and SAA for use in BMRS and Settlement calculations (see below).

4.5   Application of F-Factors in Settlement

4.5.1   SAA

F-factors would be fixed, and would apply from Settlement Period 1 on the Implementation Date for Proposed Modification P200 (i.e. the same 'January' F-factor for a BM Unit would apply in every Settlement Period of every January for the duration of the hedging scheme, and F-factors would simply cease at the end of the scheme without any gradual phasing out). Note that the duration of the hedging scheme would be 15 years from the date of the Authority's approval, and not the Implementation Date. BSC Systems would therefore need to contain the functionality to hold 12 monthly F-factors per BM Unit (all end-dated at 15 years from the Authority's approval of P200), and recognise which of these monthly values was applicable to the BM Unit in a given Settlement Period.

The SAA would be responsible for using the correct applicable F-factor volume for a BM Unit in a Settlement Period, in order to allocate 'hedged' (uniform) losses to the F-factor volume and apply zonal TLFs only to the difference between the F-factor and actual BM Unit Metered Volume in the Settlement Period. As part of the BSC Agent impact assessment, estimates are sought as to the lead time and effort which would be required to make a one-off change to Settlement systems to introduce this functionality.

Logically, the simplest way to implement this change within SAA would be to split the Metered Volume for each BM Unit into two components:

- The fixed F-factor, to which hedged losses would be applied; and

- The difference (Metered Volume − F) to which zonal losses are applied.

However, to minimise the impact on Settlement systems, it is not proposed to calculate explicitly the difference (Metered Volume − F). Instead, transmission losses would be applied to three separate components as follows:

- Hedged losses would be applied to the fixed F-factor;

- Zonal losses would be applied to the <u>entire</u> Metered Volume; and

- The zonal losses on the fixed F-factor would then be 'credited' or 'debited' back.

The formula below represents a high-level 'plain English' explanation of these revisions to the Section T Settlement calculations which would be required to reflect the P200 transitional hedging scheme. The amendments to the existing calculations are shown in red for clarity.

In each Settlement Period:

$TLM = 1 + TLF + TLMO^{+/-}$

$TLMO^{+}$ = (0.45*(total transmission losses) − (delivering Trading Units' share of transmission losses already allocated through TLF **+ (total Hedged Losses allocated to delivering and offtaking Trading Units − total Adjustment for Non-Hedged Losses for delivering and offtaking Trading Units)**)) / total volume of delivery

$TLMO^{-}$ = (0.55*(total transmission losses) − offtaking Trading Units' share of transmission losses already allocated through TLF) / total volume of offtake

Hedged Losses = F*ALF

Zonal Loss Over-Recovery Credit = F*TLF

ALF = (0.45*(total transmission losses)) / total volume of delivery

The Hedged Losses, ALF and F would be new Code/Settlement parameters. The ALF would represent the current uniform allocation of transmission losses for delivery (i.e. the existing $TLMO^{+}$ calculation with no TLF), whilst F would represent the F-factor MWh volume to which the ALF was applied. The existing TLM and $TLMO^{-}$ calculations would remain unchanged, with only the $TLMO^{+}$ calculation adjusted to reflect the total allocation of hedged losses.

In respect of each Settlement Period, the Credited Energy Volume (QCE) for each BM Unit to be allocated to the corresponding Energy Account would be determined as follows:

QCE = ((TLM * ((Metered Volume − Bid-Offer Volume) **+ (Hedged Losses − Adjustment for Non-Hedged Losses)**) all scaled to take account of Metered Volume Reallocation Notifications)

4.5.2　BMRA

The BMRA would be responsible for using F-factors in the derived data calculations on the Balancing Mechanism Reporting Service (BMRS) for Settlement Periods from (and including) Settlement Period 1 on the Implementation Date for Proposed Modification.

In accordance with Sections V2.5.2 and V2.6.3 of the Code, Estimated Transmission Losses Adjustments (ETLMOs) are used in derived data calculations on the BMRS − since the actual metered data that determines the value of $TLMO^{+/-}$ is not available until after the BMRS data must be published.

The values of ETLMO$^{+/-}$ are determined and periodically reviewed by the BSC Panel ('the Panel), and are currently based on actual TLMOs from the previous year. If P200 was approved, BSCCo would be responsible for producing a revised methodology for calculating ETLMO$^+$ to reflect the use of F-factors in addition to the introduction of zonal TLFs consistent with P198. As part of the BSCCo impact assessment, estimates are sought of any extra lead time and effort required to reflect F-factors in the ETLMO$^+$ calculation in additional to zonal TLFs.

BSCCo would be responsible for providing the revised ETLMO values to the BMRA for use in BMRS calculations. It is assumed that this would have minimal impact on the BMRA.

4.6   Retrospective Recalculation of F-Factors

The Group has not yet determined whether Parties would be able to appeal their F-factor values. In the absence of any formal appeals process, F-factors would only be retrospectively recalculated as a result of an upheld Trading Dispute progressed under the normal Disputes process. Parties would only be able to dispute the accuracy of BSCCo's calculation of F-factors based on the data which was available at the time that the calculation took place. Any subsequent changes to the data used in the Baseline Period which arose from the adjustment of metered data under the normal Settlement process would not result in retrospective recalculation of F-factors, since this would not represent a Settlement error.

4.7   Implementation Options

The Proposer suggests a potential Implementation Date for Proposed Modification P200 of 1 October 2007 (i.e. zonal TLF values and F-factor values would be used in Settlement from 1 October 2007 onwards, requiring the actual calculation of these values to take place prior to the Implementation Date). This is in line with the implementation approach currently being considered for Proposed Modification P198, which is aligned with Parties' contract rounds (i.e. either a 1 October or 1 April implementation). The Modification Group will use the lead times provided in response to this impact assessment to determine the appropriateness and feasibility of a 1 October 2007 Implementation Date for Proposed Modification P200.

5   ESTIMATED IMPACT OF MODIFICATION ON SYSTEMS, PROCESSES AND DOCUMENTATION

An initial assessment has been undertaken by BSCCo in respect of all BSC systems, documentation and processes, based on the assumption that the Proposed Modification for P200 would consist of the solution for Proposed Modification P198 with the addition of a transitional hedging scheme. Therefore only the additional impacts of Proposed Modification P200 are shown here for clarity. The full impacts of Proposed Modification P198 can be found in the P198 Requirements Specification (Reference 1). The non-confidential Party/Party Agent impact assessment responses for Proposed Modification P198 can also be found on the BSC Website (Reference 2).

The additional impacts of Proposed Modification P200 compared with Proposed Modification P198 are estimated to be:

- A one-off requirement for BSCCo to determine which BM Units fulfil the qualification criteria for the transitional hedging scheme;

- A one-off requirement for BSCCo to calculate F-factors for Qualifying BM Units;

- A one-off requirement for BSCCo to provide the CRA with 12 monthly F-factor values per BM Unit (all end-dated at 15 years after Authority approval of P200, and all of which would either be zero or positive values);

- An ongoing requirement for the CRA to allocate 12 zero F-factors to any new BM Units registered after receipt of the initial F-factors;

- An ongoing requirement for a revised Settlement calculation to be undertaken by the SAA, reflecting the allocation of hedged losses to F-factor volumes;

- A one-off requirement for BSCCo to develop a revised calculation for the Estimated Transmission Losses Adjustment (ETLMO) values used in BMRA calculations, reflecting the allocation of hedged losses in addition to zonal TLFs;

- An ongoing requirement for the BMRA to reflect the allocation of hedged losses to F-factor volumes within the derived data calculations on the BMRS, using the revised ETLMOs;

- A one-off requirement for BSCCo to publish F-factors on the BSC Website; and

- A one-off requirement for BSCCo to amend TOMAS to reflect F-factor values, and the allocation of hedged losses to F-factors.

In addition, those Parties who have their own systems to monitor the Settlement calculations may need to amend these to take account of F-factor volumes.

All of the above processes would need to contain the flexibility for the following:

- Deregistration of F-factors if a Qualifying BM Unit was subsequently deregistered;

- Setting F-factor values to zero where a Qualifying BM Unit subsequently became a Supplier BM Unit, thus losing its eligibility for the hedging scheme;

- Transfer of F-factor values through the CoBo process; and

- Retrospective recalculation of F-factors following a Trading Dispute.

6   DEVELOPMENT PROCESS

For the purposes of the impact assessment, respondents should assume that Proposed Modification P200 would be implemented as a stand-alone development project managed by BSCCo.

7   TERMS USED IN THIS DOCUMENT

Other acronyms and defined terms take the meanings defined in Section X of the Code.

Acronym/Term	Definition
Ex-ante	Based on forecast data.
F- Factor	A fixed allocation of energy for each Qualifying BM Unit, which would receive a uniform allocation of transmission losses.
Qualifying BM Unit	A BM Unit to which the transitional hedging scheme applies.
Transitional hedging scheme	Allows time-limited retention of a uniform allocation of a proportion of transmission losses for specified BM Units, via the 'F-factor'.
Transmission losses	The energy lost during the flow of power across the Transmission System (calculated as the difference between total generation and total demand).
Transmission Losses Adjustment (TLMO)	The parameter for allocating the proportion of transmission losses which are not allocated through the Transmission Loss Factor, and which is applied on a uniform basis.
Transmission Loss Factor (TLF)	The parameter for allocating some or all transmission losses on a non-uniform basis, and which is currently set to zero.
Transmission Loss Multiplier (TLM)	The factor used to scale BM Unit Metered Volumes in Settlement in order to allocate transmission losses to Parties.
Variable losses	The element of transmission losses which occurs through the heating of transmission lines, cables and transformers, and which increases with the current (and associated power flow) and length of line in which it flows.

8 DOCUMENT CONTROL

8.1 Authorities

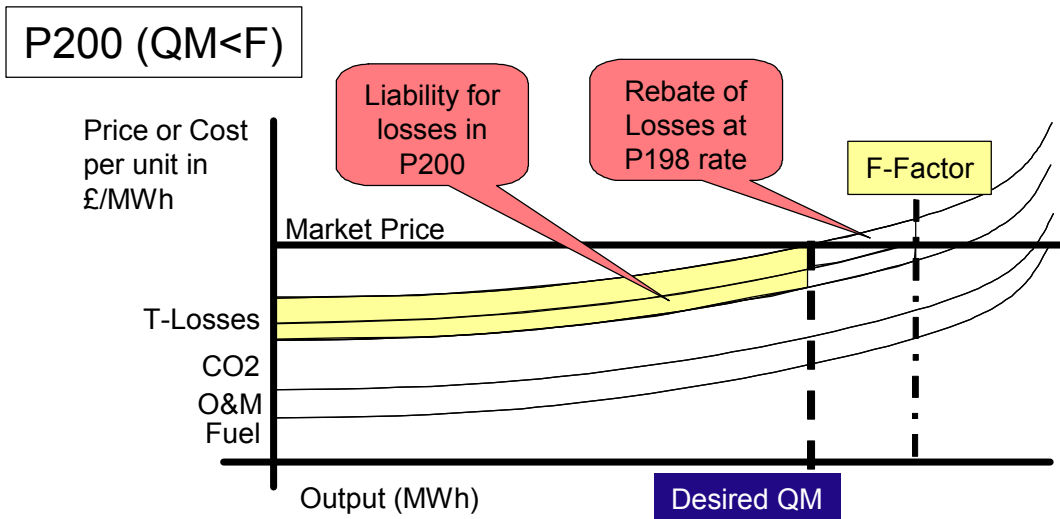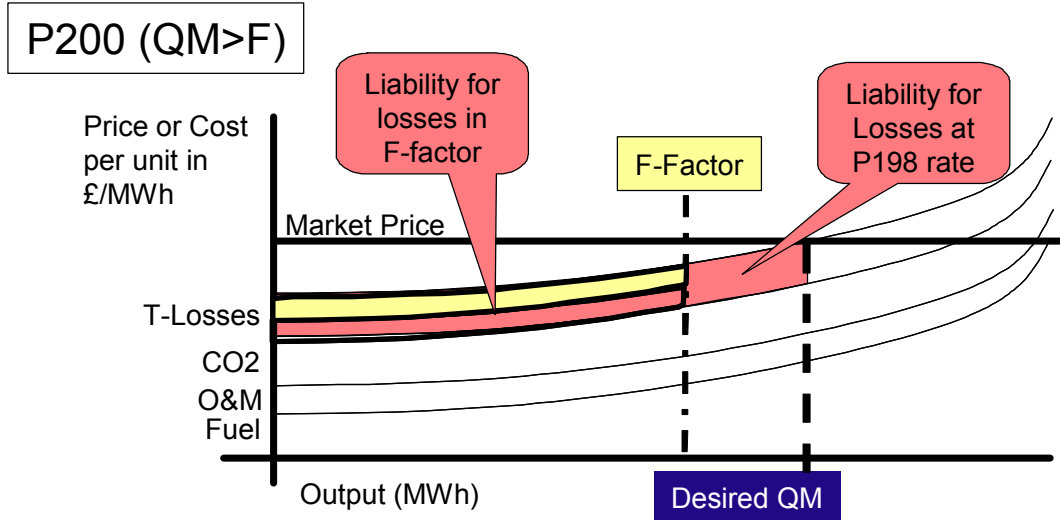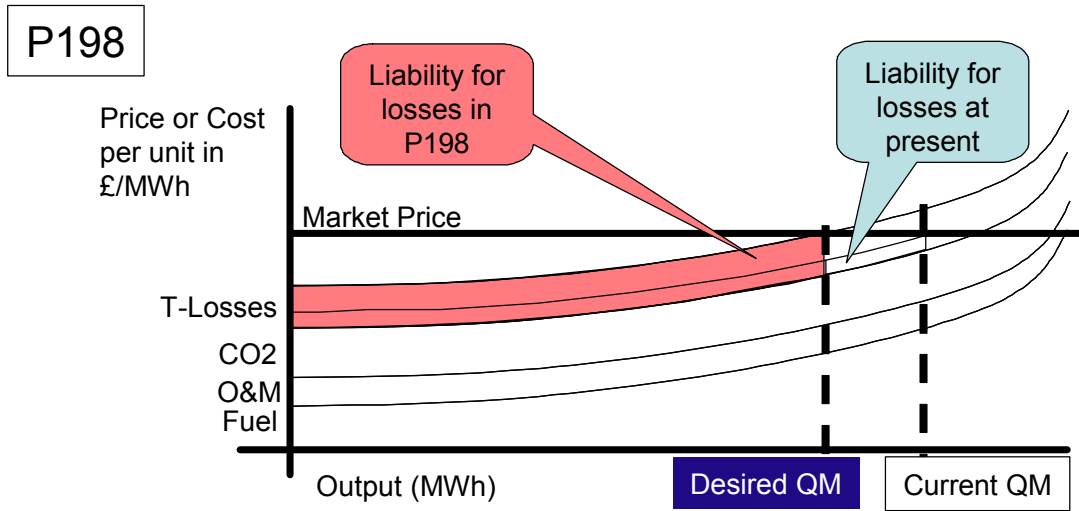| Version	Date	Author	Reviewer	Reason for Review
0.1	08/05/06	Justin Andrews	Kathryn Coffin	For technical review
0.2	10/05/06	Justin Andrews	Kathryn Coffin	For technical review
0.3	11/05/06	Justin Andrews	P200 Modification Group	For Modification Group review
0.4	15/05/06	Kathryn Coffin	Sarah Jones, John Lucas	For technical review
0.5	16/05/06	Kathryn Coffin	P200 Modification Group	For Modification Group review
1.0	18/05/06	P200 Modification Group	BSC Parties, Party Agents, BSCCo, Transmission Company, Core Industry Document Owners	For impact assessment

8.2 References

Ref.	Document Title	Owner	Issue Date	Version
1	Requirements Specification for Proposed Modification P198 'Introduction of a Zonal Transmission Losses Scheme' ELEXON - Modification Proposal 198	BSCCo	13/02/06	1.0
2	Non-Confidential Party/Party Agent Impact Assessment Responses for Proposed Modification P198 ELEXON - Modification Proposal 198	BSCCo	20/02/06	1.0

8.3 Intellectual Property Rights, Copyright and Disclaimer

This document contains materials the copyright and other intellectual property rights in which are vested in ELEXON Limited or which appear with the consent of the copyright owner. These materials are made available for you to review and to copy for the purposes of your establishment or operation of or participation in electricity trading arrangements under the Balancing and Settlement Code ("BSC"). All other commercial use is prohibited. Unless you are a person having an interest in electricity trading under the BSC you are not permitted to view, download, modify, copy, distribute, transmit, store, reproduce or otherwise use, publish, licence, transfer, sell or create derivative works (in whatever format) from this document or any information obtained from this document otherwise than for personal academic or other non-commercial purposes. All copyright and other proprietary notices contained in the original material must be retained on any copy that you make. All other rights of the copyright owner not expressly dealt with above are reserved.

No representation, warranty or guarantee is made that the information provided is accurate, current or complete. Whilst care is taken in the collection and provision of this information, ELEXON Limited will not be liable for any errors, omissions, misstatements or mistakes in any information or damages resulting from the use of this information or any decision made or action taken in reliance on this information.

APPENDIX 1: ALLOCATION OF LOSSES AND F-FACTOR APPLICATION

P198

Price or Cost per unit in £/MWh

Market Price

Liability for losses in P198

Liability for losses at present

T-Losses
CO2
O&M
Fuel

Output (MWh)

Desired QM   Current QM

P200 (QM>F)

Price or Cost per unit in £/MWh

Market Price

Liability for losses in F-factor

F-Factor

Liability for Losses at P198 rate

T-Losses
CO2
O&M
Fuel

Output (MWh)

Desired QM

P200 (QM<F)

Price or Cost per unit in £/MWh

Market Price

Liability for losses in P200

Rebate of Losses at P198 rate

F-Factor

T-Losses
CO2
O&M
Fuel

Output (MWh)

Desired QM

Key: ■ = P198   □ = current rate

APPENDIX 2: EXISTING CODE CALCULATIONS

The current allocation of transmission losses is detailed in Section T2 of the Code, whilst the existing calculation of an Energy Account's Credited Energy Volume is detailed in Section T4. The calculations involved are reproduced below. Appendix 3 shows the revisions which would be required to these calculations to allocate a non-zonal share of transmission losses to F-factor volumes under Proposed Modification P200.

2.   ALLOCATION OF TRANSMISSION LOSSES

2.1   Delivering and Offtaking Trading Units

2.1.1   For the purpose of scaling for transmission losses, in respect of each Settlement Period,

(a)   a Trading Unit is a "**delivering**" Trading Unit when $\Sigma_i QM_{ij} > 0$ and

(b)   a Trading Unit is an "**offtaking**" Trading Unit when $\Sigma_i QM_{ij} \leq 0$

where Σ_i represents the sum over all BM Units belonging to that Trading Unit.

2.2   Transmission Loss Factors

2.2.1   For the purposes of the Code, the Transmission Loss Factor for each BM Unit, and factor α, shall be as follows:

(a) $TLF_{ij} = 0$ for all BM Units, and

(b) $\alpha = 0.45$.

2.3   Determination of the Transmission Loss Multipliers

2.3.1   In respect of each Settlement Period, for each BM Unit, the Transmission Loss Multiplier shall be calculated as follows:

(a)   for all BM Units belonging to Trading Units which in the Settlement Period are delivering Trading Units:

$$TLM_{ij} = 1 + TLF_{ij} + TLMO^+_j$$

(b)   for all BM Units belonging to Trading Units which in the Settlement Period are offtaking Trading Units:

$$TLM_{ij} = 1 + TLF_{ij} + TLMO^-_j$$

where:

$$TLMO^+_j = -\{\alpha(\Sigma^+ QM_{ij} + \Sigma^- QM_{ij}) + \Sigma^+ (QM_{ij} * TLF_{ij})\}/ \Sigma^+ QM_{ij} \text{ ; and}$$

$$TLMO^-_j = \{(\alpha-1)(\Sigma^+ QM_{ij} + \Sigma^- QM_{ij}) - \Sigma^- (QM_{ij} * TLF_{ij})\}/ \Sigma^- QM_{ij} \text{ ; and}$$

Σ^+ represents the sum over all BM Units belonging to Trading Units that are delivering Trading Units in the Settlement Period;

Σ^- represents the sum over all BM Units belonging to Trading Units that are offtaking Trading Units in the Settlement Period.

4.5   Determination of Credited Energy Volumes (QCEiaj) for each Energy Account

4.5.1   In respect of each Settlement Period and each Energy Account, the Credited Energy Volume for each BM Unit to be allocated to the corresponding Energy Account of the Subsidiary Party and of the Lead Party will be determined as follows:

(a)   in the case of the corresponding Energy Account of each Subsidiary Party:

$$QCE_{iaj} = \{(QM_{ij} - QBS_{ij}) * (QMPR_{iaj}/100) + QMFR_{iaj}\} * TLM_{ij}$$

and values of QCE_{iaj} are then rounded towards zero to the nearest kWh;

(b)   in the case of the corresponding Energy Account of the Lead Party:

$$QCE_{iaj} = (QM_{ij} * TLM_{ij}) - \sum_a QCE_{iaj}$$

where $\sum_a$ represents the sum over all Energy Accounts for Subsidiary Parties of the Lead Party (not including Energy Accounts for the Lead Party itself).

APPENDIX 3: AMENDED CODE CALCULATIONS FOR PROPOSED MODIFICATION HEDGING SCHEME

This appendix shows the revisions which would be required to the Section T calculations to allocate a non-zonal share of transmission losses to F-factor volumes under Proposed Modification P200. Please note the following points regarding these revisions:

- The Group has not yet established the most appropriate calculation for the F-factor volumes themselves. Details of the approaches being considered can be found in Section 4.2.

- This Appendix does not show the calculations which would be required to produce zonal TLF values. For details of the calculation of zonal TLFs, please refer to the Requirements Specification for Proposed Modification P198 (Reference 1).

- The text below should be considered to be indicative, and not to represent the final legal text for Proposed Modification P200.

2.   ALLOCATION OF TRANSMISSION LOSSES

2.1   Delivering and Offtaking Trading Units

2.1.1   For the purpose of scaling for transmission losses, in respect of each Settlement Period,

   (c)   a Trading Unit is a "**delivering**" Trading Unit when $\Sigma_i QM_{ij} > 0$ and

   (d)   a Trading Unit is an "**offtaking**" Trading Unit when $\Sigma_i QM_{ij} \leq 0$

   where Σ_i represents the sum over all BM Units belonging to that Trading Unit.

2.2   Transmission Loss Factors

2.2.1   For the purposes of the Code, the Transmission Loss Factor for each BM Unit, and factor α, shall be as follows:

   (c) $TLF_{ij} = 0$ for all BM Units, and

   (d) $\alpha = 0.45$.

2.3   Determination of the Transmission Loss Multipliers

2.3.1   In respect of each Settlement Period, for each BM Unit, the Transmission Loss Multiplier shall be calculated as follows:

   (a)   for all BM Units belonging to Trading Units which in the Settlement Period are delivering Trading Units:

   $$TLM_{ij} = 1 + TLF_{ij} + TLMO^+_j$$

   (b)   for all BM Units belonging to Trading Units which in the Settlement Period are offtaking Trading Units:

   $$TLM_{ij} = 1 + TLF_{ij} + TLMO^-_j$$

   where:

   $ALF_j = -\alpha(\Sigma^+ QM_{ij} + \Sigma^- QM_{ij}) / \Sigma^+ QM_{ij}$; and

$$\text{TLMO}^+_j = \text{ALF}_j - \{\Sigma^+ (\text{QM}_{ij} * \text{TLF}_{ij}) + \Sigma_i \text{QHED}_{ij}\}/ \Sigma^+\text{QM}_{ij} ;$$

$$\text{TLMO}^-_j = \{(\alpha-1)(\Sigma^+\text{QM}_{ij} + \Sigma^-\text{QM}_{ij}) - \Sigma^- (\text{QM}_{ij} * \text{TLF}_{ij})\}/ \Sigma^-\text{QM}_{ij} ; \text{ and}$$

Σ^+ represents the sum over all BM Units belonging to Trading Units that are delivering Trading Units in the Settlement Period;

Σ^- represents the sum over all BM Units belonging to Trading Units that are offtaking Trading Units in the Settlement Period; and

Σ_i represents the sum over all BM Units.

4.5 Determination of Credited Energy Volumes (QCEiaj) for each Energy Account

4.5.1 In respect of each Settlement Period and BM Unit, the BM Unit Hedged Losses Volume (QH$_{ij}$), BM Unit Non-Hedged Losses Adjustment (QNH$_{ij}$) and BM Unit Total Losses Adjustment (QHED$_{ij}$) shall be calculated as follows:

$$\text{QHED}_{ij} = \text{QH}_{ij} - \text{QNH}_{ij}$$

$$\text{QH}_{ij} = \text{ALF}_j * \text{F}_i$$

$$\text{QNH}_{ij} = \text{TLF}_j * \text{F}_i$$

4.5.**2** In respect of each Settlement Period and each Energy Account, the Credited Energy Volume for each BM Unit to be allocated to the corresponding Energy Account of the Subsidiary Party and of the Lead Party will be determined as follows:

(a) in the case of the corresponding Energy Account of each Subsidiary Party:

$$\text{QCE}_{iaj} = \textbf{UQCE}_{iaj} + \textbf{AQHED}_{iaj}$$

where:

$$\textbf{UQCE}_{iaj} = \{(\text{QM}_{ij} - \text{QBS}_{ij}) * (\text{QMPR}_{iaj}/100) + \text{QMFR}_{iaj}\} * \text{TLM}_{ij}$$

$$\textbf{AQHED}_{iaj} = \textbf{QHED}_{ij} * (\textbf{QMPR}_{iaj}/100)$$

and values of QCE$_{iaj}$ are then rounded towards zero to the nearest kWh;

(b) in the case of the corresponding Energy Account of the Lead Party:

$$\text{QCE}_{iaj} = \textbf{UQCE}_{iaj} + \textbf{AQHED}_{iaj}$$

$$\textbf{UQCE}_{iaj} = (\text{QM}_{ij} * \text{TLM}_{ij}) - \Sigma_a\text{QCE}_{iaj}$$

$$\textbf{AQHED}_{iaj} = \textbf{QHED}_{ij} - \Sigma_a\textbf{AQHED}_{iaj}$$

where Σ_a represents the sum over all Energy Accounts for Subsidiary Parties of the Lead Party (not including Energy Accounts for the Lead Party itself).