REVISED REQUIREMENTS SPECIFICATION for Proposed Modification P200

'Introduction of a Zonal Transmission Losses Scheme with Transitional Scheme'

Prepared by: P200 Modification Group

Date of Issue:	29 June 2006	**Document Reference:**	P200AS
Reason for Issue:	For Second Impact Assessment	**Version Number:**	2.0

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 implementation of P200.

Alternative Modification P200 builds upon the same solution as for the Proposed Modification except that the zonal TLFs would vary by BSC Season; four values, instead of one annual value.

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 four times to date on 12, 31 May and 15, 21 June 2006 and has discussed, agreed and further refined the solution requirements for the Proposed Modification and developed an alternative Modification.

This document sets out the requirements agreed by the Group at their last meeting on 21 June 2006, and requests a further impact assessment from BSC Agents, BSC Parties, the Transmission Company and BSCCo.[1] It focuses on the agreed solution for the transitional hedging scheme element of P200, which is additional to the functionality of zonal TLFs proposed under P198. Therefore, respondents are requested to refine their responses to the first impact assessment and only identify any impacts or lead times arising from Proposed Modification P200 which are additional to those already identified for Proposed Modification P198. Additionally respondents are requested to identify any further impacts for the Alternative Modification. Copies of the non-confidential Party/Party Agent impact assessment responses for the first impact assessment for Proposed Modification P200 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 Justin Andrews (020 7380 4364), e-mail address justin.andrews@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 (both Proposed and Alternative Modifications).

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. P200 Alternative Modification can be considered as P200 Proposed Modification plus zonal TLFs that vary by BSC Season.

Aspect of Solution	P198 Proposed	P198 Alternative	P200 Proposed	P200 Alternative
Scope of Zonal TLF Calculation	Scaled Marginal (Variable Losses Only)	Scaled Marginal (Variable Losses Only)	Scaled Marginal (Variable Losses Only)	Scaled Marginal (Variable Losses Only)
Applicable Period for Zonal TLFs	BSC Year	BSC Season	BSC Year	BSC Season
Nature of TLF Calculation	Ex-Ante	Ex-Ante	Ex-Ante	Ex-Ante
Applicable Zones for Production BM Units	GSP Group	GSP Group	GSP Group	GSP Group
Applicable Zones for Consumption BM Units	GSP Group	GSP Group	GSP Group	GSP Group
Mitigation of Impacts	None	Linear Phasing	Hedging for Fixed Volumes	Hedging for Fixed Volumes
Period of Mitigation	None	4 years	15 years from the implementation of P200	15 years from the implementation of 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 revised 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 and the initial impact assessment on P200. Copies of the non-confidential Party/Party Agent impact assessment responses received for Proposed Modification P198 and P200 can be found on the BSC Website (Reference 3).

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'). The qualifying criteria are 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'. 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). The effect of this mechanism is that the zonal TLM 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 implementation date 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 have losses attributed to them based on a full (non-mitigated) zonal TLM, consistent with P198.

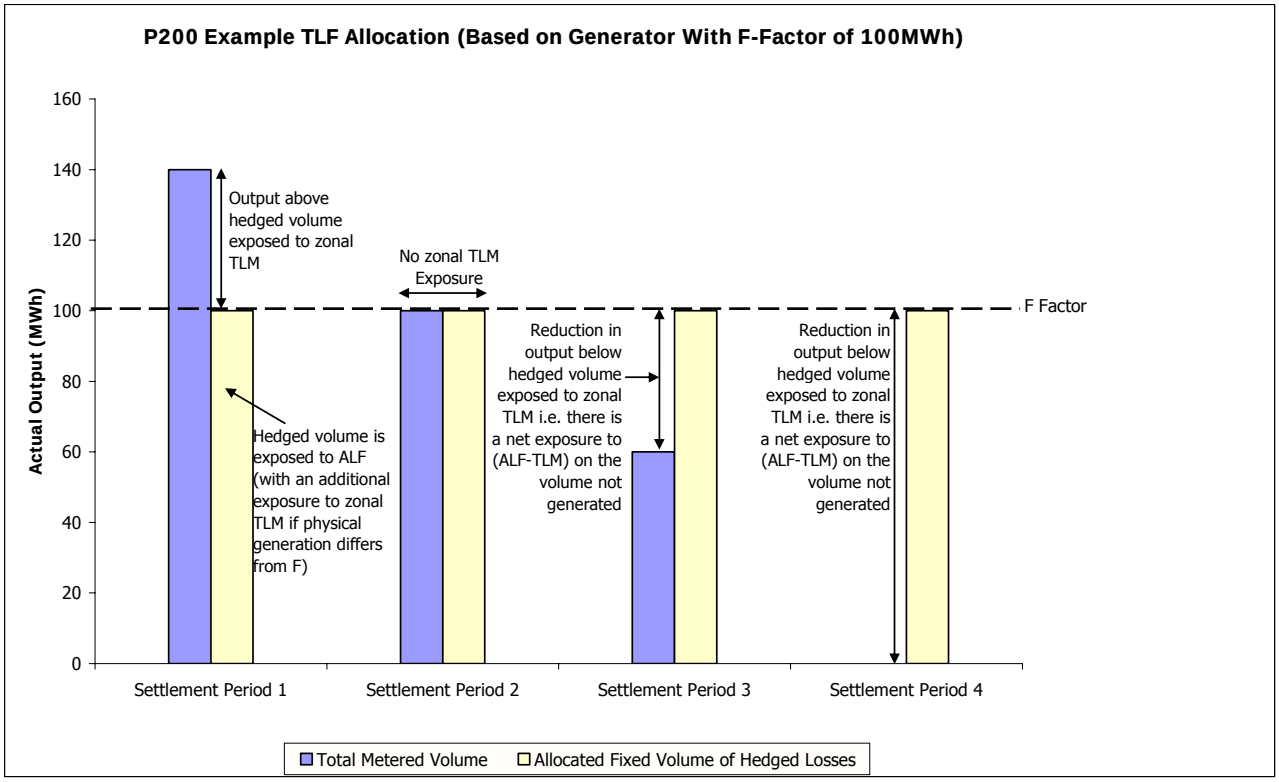
3.2 Example TLF Allocation Under Proposed Modification

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 dis-benefit for the Qualifying BM Unit, depending on whether it was subject to a positive or negative zonal TLF. For example, a generator in the north (e.g. an exporting zone) would be credited with positive energy if it generated under its F-factor volume, whereas a generator in the south (importing zone) would be credited with negative energy if it generated under its F-factor volume.

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 data gathering exercise for BM Units registered in Scotland (impacting BSC Parties);
2) A one-off determination of Qualifying BM Units (impacting BSCCo);
3) A one-off calculation of F-factor volumes for Qualifying BM Units (impacting BSCCo);
4) A one-off publication of F-factor volumes for Qualifying BM Units (impacting BSCCo);
5) 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);

6) 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); and

7) An ongoing obligation on BSC Parties to notify BSCCo of certain information on registering a new BM Unit.

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.

In addition, confirmation is sought as to whether the data required to calculate the criteria, for determining which BM Units would qualify for the transitional hedging scheme, could be obtained by BSCCo via its Trading Operations Market Analysis System (TOMAS), or would need to be obtained from BSC Agents.

4.1.2 Qualification Criteria – Eligibility Based on Trading Unit Behaviour

Qualifying BM Units would be required to:

a) Be part of a Trading Unit, on the end date of the Qualifying Period, i.e. on 31 March 2006, that was not registered as a Base Trading Unit[2] (i.e. which did not include Supplier BM Units). The relationship of BM Unit to Trading Unit would be as on the settlement date of the 31 March 2006 and would be assumed to be constant over the whole Qualifying Period. This would also include Sole Trading 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.

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. A separate rule is therefore required whereby all Interconnector Error Administrator BM Units which existed during the Qualifying Period would automatically qualify for the scheme, while all other Interconnector BM Units would not. Any new Interconnector Error Administrators which registered after the end of the Qualifying Period would not be eligible for the scheme, in the same way as new generation entrants.

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

The Group have agreed the Qualifying Period as:

i) 1 April 2005 – 31 March 2006

[2] As defined under BSC Section K4.7.

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

Data for the Qualifying Period would be used from the latest Settlement Runs available on the date the calculations are performed for Qualification and F-factor volume, e.g. after the Authority's approval of P200.

4.1.4 Changes to Qualifying Status

The Group has determined that Parties would not be able to appeal BSCCo's determination regarding their eligibility for the transitional hedging scheme under Proposed Modification P200. As a result, 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

There are a number of circumstances where a change in BM Unit registration would affect the qualification and therefore F-factor volume of a BM Unit. These circumstances and subsequent treatment thereof are described as follows:

1. If a Qualifying BM Unit subsequently became a Supplier BM Unit[3] after the end of the Qualifying Period, it would no longer qualify for the transitional hedging scheme. 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 or Additional BM Unit. If the previously Qualifying BM Unit which is now settled under the SVA arrangements then re-registered back in CVA, it would then have its F-factor set to what is was when it qualified;

2. If a Party deregistered a Qualifying BM Unit after the end of the Qualifying Period prior to the publication of the F-Factor volumes (as part of the implementation of P200, expected to be approximately [3-6[4]] months after the Authority's approval of P200), the F-factor would automatically be set to zero. However, Parties registering new BM Units in that period would be obliged to declare whether the plant/apparatus had previously had an F-factor under another BM Unit and, if so, the F-factor would be transferred to the new BM Unit. This would result in a 'one-off exercise' by Parties to check any de-registration/registrations after the publication of the F-factor volumes. The Group noted that ELEXON would not be able to 'police' these declarations, but that giving false information would put the Party in breach of the Code. A Code obligation would be introduced which has effect from the end of Qualifying Period (noting that there is currently no concept of a BM Unit re-registration in the Code);

3. Ongoing, following publication of F-factor volumes, if a Party deregistered a Qualifying BM Unit, the F-factor would automatically be set to zero. As above in point 2, Parties registering new BM Units

[3] For example: this could be when an embedded generator transfers from CVA to SVA and then either becomes part of a Base BM Unit or is an Additional BM Unit.
[4] subject to results of impact assessment.

would be obliged to declare whether the plant/apparatus had previously had an F-factor under another BM Unit and, if so, the F-factor would be transferred to the new BM Unit. If this de-registration was 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);

4. If a Party moved the physical location of some equipment or if the equipment is replaced at the same location, this would be subject to consideration of planning consents. Therefore. if new planning consents were being sought then this would be deemed as new plantl; if not the Party would be obliged, as per points 2 and 3 above, to declare whether the plant/apparatus had previously had an F-factor under another BM Unit and, if so, the F-factor would be transferred to this BM Unit;

5. The Group agreed that, if a BM Unit changed ownership via a Change of BM Unit Ownership (CoBo) process during the 15 years of the hedging scheme, it would be mandatory for the F-factor to transfer to the new owner of the BM Unit. It was noted that Parties currently had the option of choosing which attributes of the BM Unit to transfer, and that a specific obligation regarding F-factors would therefore be introduced into BSCP15 and/or the Code (noting that there is currently no concept of a CoBo in the Code).

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 implementation 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 two potential options for the Baseline Period as follows:

- 1 April 2005 – 31 March 2006 (same as Qualifying Period); or
- 1 April 2002 – 31 March 2006 (48 months). Data for England and Wales is available centrally for all of this period. However, data for BM Units in Scotland for the period 1 April 2002 - 31 March 2005 would have to be sourced directly from the registered Parties (as this was pre BETTA) with supporting confirmation. Therefore, an obligation would be placed on these Parties to provide metered data for the appropriate BM Units.

Note that the duration of the Qualifying Period and Baseline Period would therefore not necessarily be the same. The Group also noted that there may be incomplete data for some BM Units registered in Scotland.

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 and how the data would be sourced for BM Units in Scotland for the period 1 April 2002 - 31 March 2005.

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 may be non-zero. Non-qualifying BM Units would receive a set of 12 zero values.

4.2.3 F-Factor Calculation

The Group has agreed an approach for the calculation of F-factors, as set out below. As part of the BSCCo impact assessment, estimates are sought as to determine the lead time and man effort required to undertake the F-factor calculation.

Note that there could be circumstances where a Qualifying BM Unit deregisters or becomes a Supplier BM Unit (and therefore becomes 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 – F-Factors Based on Trading Unit Behaviour

This approach is based on qualification for the transitional hedging scheme on Trading Unit behaviour. 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.

In summary the monthly average Metered Volume of the Trading Unit would be calculated (net of any demand in that Trading Unit), and this aggregate F-factor would then be allocated pro-rata by Metered Volume to those BM Units in the Trading Unit which were 'net export' during the month. Those BM Units in the Trading Unit which were 'net import' in the month would receive zero F-factors.

The relationship of BM Unit to Trading Unit is based the registration details as end of the Qualifying Period, i.e. 31 March 2006. Therefore, it is proposed to ignore any affects of change in registration/ownership in the Baseline Period i.e. if a BM Unit changed Trading Units part-way through the Baseline Period.

The approach would be as follows:

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

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.

Treatment of Interconnector BM Units would be as follows:

i) Calculate an F-factor for each Interconnector as a whole, based on historic net flows (Metered Volumes) across the Interconnector. The F-factor for each Interconnector would therefore be net of demand; and

ii) This F-factor would be allocated to the Interconnector Error Administrator – who could then choose whether to allocate this across its users through its contracts outside the Code.

Treatment of missing data or where the registration of BM Unit is part way through the baseline period:

i) The Group agreed that Metered Volumes for BM Units that had newly registered should not be included until the BM Unit had started generating. Therefore, the F-factor calculation would only use Metered Volumes for those Settlement Periods where the BM Unit had first started generating. Settlement Periods with a 'NUL' value allocated to them in BSC Systems rather than a zero would not be used; and

ii) For the avoidance of doubt if a BM Unit is on outage and therefore has zero Metered Volume, these values would be included in the F-factor calculation.

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. The requirement is to publish [3-6][5] months after the Authority's approval of P200. This would be to support the one-off checking exercise by Parties of any changes in BM Unit registrations from the end of the Qualifying Period, i.e. from 1 April 2006. 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.

Parties responding to the first impact assessment indicated a lead time of 3 months that they would require between the publication of F-factor values and the first use of F-factors in Settlement on the Implementation Date. However, as indicated above it is now proposed to publish F-factor volumes [3-6] months after the Authority's approval of P200, which based on the current P200 implementation timescales of 12 months should mean that F-factors are published 6-9 months before the implementation of P200.

4.4 Registration of F-Factors in BSC Systems

BSCCo would be responsible for sending F-factors to the Central Registration Agent (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 Implementation Date of the 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 Balancing Mechanism Reporting Agent (BMRA) and Settlement Administration Agent (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). BSC Systems would therefore need to contain the

[5] subject to results of impact assessment.

functionality to hold 12 monthly F-factors per BM Unit, 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 TLMs 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 man effort which would be required to make a one-off change to Settlement systems to introduce this functionality.

As explained in sections 3.1 and 3.2 of this document, the transmission losses allocated to each BM Unit under Proposed Modification P200 are comprised of the following three components:

- All Qualifying BM Units[6] are allocated the quantity of transmission losses that they would have had to contribute under the current BSC baseline (i.e. uniform non-zonal allocation of transmission losses), had their generation been at the level of their F-factor volume F_i. In algebraic terms, the BM Unit is allocated a quantity of losses:

  $$F_i * ALF_j$$

  where ALF_j is the Delivering Transmission Losses Adjustment ($TLMO^+_j$) that would have been calculated in Settlement Period j under the current BSC baseline. This amount is negative or zero. It is zero for BM Units that do not qualify for P200 (e.g. those that were offtaking during the historic period over which F values were calculated) and which therefore have their value of F set to zero at all times.

- All BM Units are also required to contribute losses on a zonal basis on the difference ($QM_{ij} – F_i$) between their metered volume and F-factor volume. In algebraic terms, the BM Unit is required to contribute the following quantity of losses:

  $$(QM_{ij} – F_i) * ZLF_{ij}$$

  where ZLF_{ij} is the loss factor the BM Unit would have been exposed to under a zonal losses scheme (without any hedging):

  $ZLF_{ij} = TLF_{ij} + Pre\_P200\_TLMO^+_j$ (for a BM Unit in a delivering Trading Unit); or

  $TLF_{ij} + Pre\_P200\_TLMO^-_j$ (for a BM Unit in an offtaking Trading Unit)

  where $Pre\_P200\_TLMO^+_j$ and $Pre\_P200\_TLMO^-_j$ are the TLMO values that would have been calculated under Proposed Modification P198 (without taking F values into account[7]).

  This term can be positive or negative, depending on the signs of ($QM_{ij} – F_i$) and of ZLF_{ij}. For BM Units with a value of F set to zero, this formula is equivalent to applying ZLF_{ij} to their metered quantity QM_{ij}.

- As under the current baseline, the final step in the loss allocation process is to calculate Transmission Losses Adjustments $TLMO^+_j$ and $TLMO^-_j$, in order to ensure that the correct amount of transmission losses is allocated in total, and the required 45/55 split between delivering and offtaking Trading Units is maintained. In algebraic terms, the additional amount of losses allocated to each Trading Unit is as follows:

  $QM_{ij} * TLMO^+_j$ (BM Units in delivering Trading Units)

  $QM_{ij} * TLMO^-_j$ (BM Units in offtaking Trading Units)

[6] The proposed Section T algebra does not explicitly restrict this to Qualifying BM Units. However, as non-Qualifying BM Units will have a zero F_{ij} value, the effect is the same.

[7] In fact, for reasons described in section 4.9.3 below, F values actually have no effect on $TLMO^-_j$, and therefore $Pre\_P200\_TLMO^-_j$ is equal to $TLMO^-_j$. The same is not true of $TLMO^+_j$. The proposed algebra uses the acronym $ZTLMO_j$ for $Pre\_P200\_TLMO^+_j$.

In overview terms, the effect of the changes to Section T introduced by Proposed Modification P200 is to ensure that all BM Units are allocated the above three components of losses. Sections 4.5.1.1 to 4.5.1.3 below provide additional detail on how the algebra achieves this:

- Section 4.5.1.1 explains in detail how the proposed algebra achieves the intent of Proposed Modification P200 in the case of BM Units in delivering Trading Units;
- Section 4.5.1.2 provides further explanation of the role played by $TLMO^{+}_{j}$ in the P200 algebra; and
- Section 4.5.1.3 explains how the proposed algebra achieves the intent of Proposed Modification P200 in the case of BM Units in offtaking Trading Units.

4.5.1.1 Detailed Explanation of Algebra (for BM Units in Delivering TU)

The total amount of transmission losses that a BM Unit in a delivering Trading Unit must contribute is the sum of the three components listed in 4.9.1 above:

$$\text{Total Losses} = F_i * ALF_j + (QM_{ij} - F_{ij}) * ZLF_{ij} + QM_{ij} * TLMO^{+}_{j}$$

However, in order to achieve this allocation of losses in the Code (and in BSC Systems), it is helpful to split the total quantity of losses into two sub-components – those that depend upon the actual Metered Volume QM_{ij}, and those that are independent of it:

$$\text{Losses Dependent on QM} = QM_{ij} * (ZLF_{ij} + TLMO^{+}_{j})$$

$$\text{Losses Independent of QM} = F_{ij} * (ALF_j - ZLF_{ij})$$

The first component can be allocated by setting the Transmission Loss Multiplier applied to their Metered Volume as follows:

$$TLM_{ij} = 1 + ZLF_{ij} + TLMO^{+}_{j}$$

The second component does not apply to Metered Volume and so cannot be included in TLM_{ij}. Instead, this component (referred to in the algebra as $QHED_{ij}$, the BM Unit Total Losses Adjustment) is added directly into the Credited Energy Volume (QCE_{iaj}) for the Party (or Parties) responsible for that BM Unit. In deciding which Party or Parties to allocate the losses to, the algebra takes into account any Metered Volume Reallocation Notifications applicable to the BM Unit.

It should be noted that the algebra breaks $QHED_{ij}$, the BM Unit Total Losses Adjustment, into two separate components QH_{ij} and QNH_{ij}:

$$QHED_{ij} = QH_{ij} - QNH_{ij}$$

where $QH_{ij} = ALF_j * F_i$, and $QNH_{ij} = ZLF_{ij} * F_i$. The variables QH_{ij} and QNH_{ij} can be interpreted as follows:

- The BM Unit Hedged Losses Volume (QH_{ij}) is the amount of hedged losses allocated to the F-factor volume i.e. the first of the three loss components listed in section 4.5.1 above;
- The BM Unit Non-Hedged Losses Adjustment (QNH_{ij}) can be thought of as an adjustment to compensate for the fact that elsewhere in the rules the TLM has applied the zonal loss factor ZLF_{ij} to all the Metered Volume (QM_{ij}). As explained in section 4.5.1, the intent of P200 is that the zonal losses ZLF_{ij} should apply only to the difference ($QM_{ij} - F_{ij}$) between the metered volume and the F-factor volume. However, TLM_{ij} (which includes the zonal losses ZLF_{ij}) is applied to the whole of the metered volume. If left uncorrected, this would mean that zonal losses were applied more than is correct, by an amount $QNH_{ij} = ZLF_{ij} * F_i$. By subtracting this quantity from the Credited Energy Volume, the algebra ensures that zonal losses are only applied to deviations from the hedged volume F_i, not to the entire Metered Volume.

Hence, QNH_{ij} reimburses the BM Unit for losses allocated to the volume F_{ij} at the zonal rate, whilst QH_{ij} allocates the uniform losses that the BM Unit should contribute in respect of volume F_{ij}.

4.5.1.2 The Role of $TLMO^+_j$ in the P200 Algebra

In general, the role of $TLMO^+_j$ in the BSC is to ensure that the total amount of losses assigned to BM Units in delivering Trading Units is equal (in each Settlement Period) to 45% of the total metered transmission losses. Therefore the equation for $TLMO^+_j$ will in general be as follows:

$$TLMO^+_j = -\{ \alpha \text{ (Total Metered Losses)} + \text{All Losses Already Allocated to Delivering TU} \} / \Sigma^+ QM_{ij}$$

For Proposed Modification P200, the Modification Group agreed that all of the $QHED_{ij}$ values should be accounted for in the $TLMO^+_j$ equation rather than the $TLMO^-_j$ equation (even if the BM Unit to which the QHED value applies is in an offtaking Trading Unit). This ensures that the introduction of the P200 scheme would have no impact on the allocation of transmission losses to offtaking BM Units that don't qualify for an F value (e.g. Supplier BM Units), and leads to the following equation for $TLMO^+_j$:

$$TLMO^+_j = -\{ \alpha(\Sigma^+ QM_{ij} + \Sigma^- QM_{ij}) + \Sigma^+(QM_{ij} * ZLF_{ij}) + \Sigma_i QHED_{ij} \} / \Sigma^+ QM_{ij}$$

However, the P200 Proposer suggested the following alternative equation for $TLMO^+_j$:

$$TLMO^+_j = -\Sigma_i QHED_{ij} / \Sigma^+ QM_{ij}$$

Analysis shows that the two equations are mathematically equivalent. It is proposed to include the latter form of the equation (which is simpler, although less similar in appearance to the current BSC equation) in the drafting.

It should be noted that $TLMO^+_j$ plays a slightly different role under P200 from its role in the current BSC baseline (or in Proposed Modification P198):

- Under the current BSC baseline, $TLMO^+_j$ is the only mechanism for allocating losses to delivering Trading Units. Therefore it will always take a negative value (to 'scale down' delivering Metered Volumes in order to account for transmission losses).
- Under Proposed Modification P198, the application of losses can be regarded as a two-stage process. In the first stage, a zonal loss factor TLF_{ij} is applied to all Metered Volumes. However, this process will not necessarily achieve the required 45/55 split in the allocation of losses between delivering and offtaking Trading Units. The $TLMO^+$ calculation therefore represents a second stage of loss allocation, which achieves the required 45/55 split. Analysis of Proposed Modification P198 suggests that $TLMO^+$ values calculated under this baseline would be predominantly positive, to compensate for the fact that TLF_{ij} values (when calculated with Cowley as the slack node in the load flow model) are predominantly negative.

In contrast, one would expect P200 $TLMO^+_j$ values to be much closer to zero. This is because the initial allocation of losses under P200 will be much closer to maintaining the required 45/55 split. In particular:

- Hedged volumes under P200 are exposed to the Average Loss Factor (ALF_j), which would by definition achieve the required 45/55 split if applied to all delivering Trading Units.
- Non-hedged volumes are exposed to a zonal Transmission Loss Multiplier ZLF_{ij}, which would again (by definition) achieve the required 45/55 split if applied to all delivering Trading Units.

It can be seen therefore that in the two extreme cases, the $TLMO^+_j$ values calculated under P200 would be exactly zero:

- If all BM Units in delivering Trading Units qualified for P200, and all their Metered Volumes exactly matched their F-volumes, the $TLMO^+$ values would be zero, because everyone would be exposed to ALF_j (which achieves the required 45/55 split without the need for a further TLMO calculation).
- Conversely, if no BM Units qualified for P200, the $TLMO^+$ values would be zero because everyone would be exposed to ZLF_{jj} (which again achieves the required 45/55 split without the need for a further TLMO calculation).

In practice there will be a mixture of hedged and non-hedged volumes in each Settlement Period, and $TLMO^{+}_{j}$ values will therefore deviate from zero. However, it is still expected that $TLMO^{+}_{j}$ will be much closer to zero under Proposed Modification P200 than under either the current baseline or Proposed Modification P198.

4.5.1.3 BM Units in Offtaking Trading Units

As Proposed Modification P200 applies only to BM Units that were generating in the historic period over which F-values are calculated, most BM Units in offtaking Trading Units will be outside the scope of P200, and will therefore have zero F values. However, there may be some BM Units with non-zero F values that are now in offtaking Trading Units. The treatment of transmission losses for such BM Units is very similar to that for BM Units in delivering Trading Units. The losses allocated to that BM Unit are the same three components listed in 4.9.1 above.

The one key difference is that (as described in 4.9.3 above) all the effects of hedging are included in the $TLMO^{+}_{j}$ calculation rather than the $TLMO^{-}_{j}$ calculation. This leads to slightly simpler algebra as follows:

- For delivering Trading Units, the algebra requires separate acronyms $ZTLMO_{j}$ (i.e. the TLMO value calculated without taking hedging into account) and $TLMO^{+}_{j}$ (i.e. a further adjustment to the allocation of losses to take into account the effects of hedging).
- For offtaking Trading Units, there is no distinction between the two, and a single acronym $TLMO^{-}_{j}$ suffices.

Note that $TLMO^{-}_{j}$ values calculated under Proposed Modification P200 would be exactly the same as those calculated under Proposed Modification P198.

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.

Under P200, TLMO+ values are expected to be more volatile, and closer to zero. This is because hedged volumes have transmission losses applied through the BM Unit Total Losses Adjustment (QHED) mechanism, prior to calculation of TLMO. As a result the volume of transmission losses allocated through TLMO+ will be smaller, and will depend on the extent to which BM Units' output matches their F-values (which may vary from Settlement Period to Settlement Period). The Imbalance Settlement Group, ISG (who set ETLMO values, acting with delegated authority from the Panel) will need to take these factors into account when agreeing ETLMO+ values. Note that ISG would have the option of setting zero ETLMO+ values, if they believed this best represented the likely behaviour of TLMO+.

Under P200 (which has monthly F-factors), there would be 12 monthly ETLMO values. As F-factors are used in the TLMO+ (and not the TLMO-) calculation, this would result in the following ETLMO data being submitted by BSCCo to the BMRA:

i) One annual value of ETLMO-, which would be constant for all Settlement Periods within a BSC Year. For each Settlement Period, this ETLMO- value would be applied to all BM Units which were part of offtaking Trading Units in that Settlement Period; and

ii) 12 monthly values of ETLMO+ (1 per calendar month of the BSC Year, and which would be constant for all Settlement Periods within each calendar month). For each Settlement Period, the applicable monthly ETLMO+ would be applied to all BM Units which were part of delivering Trading Units in that Settlement Period.

The provision of these values by BSCCo would continue to be a manual interface. 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 determined that Parties would not be able to appeal their F-factor values. Therefore, 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 (note that data from the latest Settlement Run type would be used at the time of calculation). 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). However the Proposer does recognise that this is subject to feasibility. The implementation date for Proposed Modification P198 is 1 April 2008, based on lead time of 12 months. This date is aligned with Parties' contract rounds, i.e. either a 1 October or 1 April implementation. Based on the initial impact assessment for P200, which indicates the same implementation timescales for P200 as for P198, Parties are requested to identify any further issues with this approach.

5 ALTERNATIVE MODIFICATION

The Alternative Modification builds upon the same solution as for the Proposed Modification except that the Zonal TLFs would vary by BSC Season, i.e. 4 values, instead of one annual value.
Therefore, as per the solution for P198, the Transmission Loss Factor Agent would calculate Nodal TLFs and zonal TLFs in the same way as for the Proposed Modification, but would time-weight by BSC Season rather than by BSC Year to calculate a set of four Seasonal Zonal TLFs for each TLF Zone – one for each BSC Season. The BSC Seasons are already defined in Section K of the Code, and are: BSC Spring: 1 March – 31 May inclusive; BSC Summer: 1 June – 31 August inclusive; BSC Autumn: 1 September – 30 November inclusive; and BSC Winter: 1 December – 28 February inclusive (or 29 February in a leap year). The zonal TLF part of the Alternative Modification is based on the P198 Alternative Modification without the linear phasing element of that solution.

Respondents to the revised impact assessment are requested to only identify any impacts or lead times arising from Proposed Modification P200 which are additional to those already identified for Proposed Modification P198 and the initial impact assessment on P200.

6 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 the implementation 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.

It is assumed that the P200 Alternative Modification has the same additional impacts as for the P200 Proposed Modification compared with Proposed Modification P198 (with seasonal TLF element of the P198 Alternative Modification).

7 DEVELOPMENT PROCESS

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

8 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.

9 DOCUMENT CONTROL

9.1 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
1.1	09/06/06	Justin Andrews	Sarah Jones, Kathryn Coffin	Revised Specification for technical review
1.2	14/06/06	Justin Andrews	P200 Modification Group	Revised Specification for Modification Group review
1.3	22/06/06	Justin Andrews	P200 Modification Group	Revised Specification following Modification Group review
1.4	29/06/06	Justin Andrews	Sarah Jones, Kathryn Coffin	Internal review prior to second impact assessment

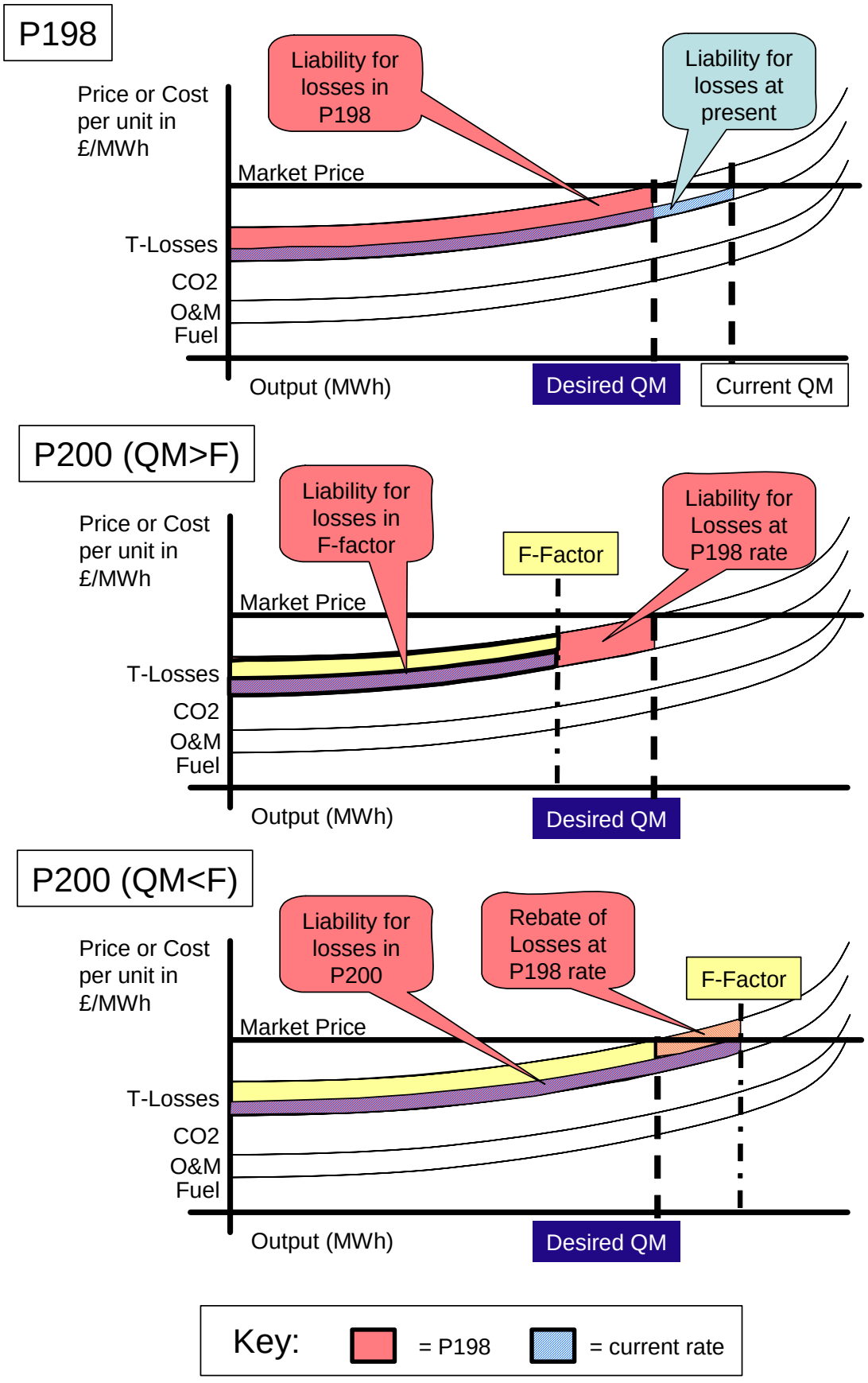
2.0	29/06/06	P200 Modification Group	BSC Parties, Party Agents, BSCCo, Transmission Company, Core Industry Document Owners	For impact assessment

9.2 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 P200 Inset hyperlink	BSCCo	30/05/06	1.0
3	Non-Confidential Party/Party Agent Impact Assessment Responses for Proposed Modification P198 ELEXON - Modification Proposal 198	BSCCo	20/02/06	1.0

9.3 Intellectual Property Rights, Copyright and Disclaimer

APPENDIX 1: ALLOCATION OF LOSSES AND F-FACTOR APPLICATION



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:

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

$$TLMO^{-}_{j} = \{(\alpha-1)(\Sigma^{+}QM_{ij} + \Sigma^{-}QM_{ij}) - \Sigma^{-}(QM_{ij} * TLF_{ij})\} / \Sigma^{-}QM_{ij}$$; 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:

- 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:

$$\mathbf{ZLF_{ij} = TLF_{ij} + ZTLMO_j}$$

$$TLM_{ij} = 1 + \text{~~TLF}_{ij}\text{~~} \mathbf{ZLF_{ij}} + TLMO^{+}_{j}$$

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

$$\mathbf{ZLF_{ij} = TLF_{ij} + TLMO^{-}_{j}}$$

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

where:

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

$$\mathbf{ZTLMO_j = ALF_j - \{\Sigma^{+} (QM_{ij} * TLF_{ij}) \} / \Sigma^{+}QM_{ij} ;}$$

$$\mathbf{TLMO^{+}_j = - \Sigma_i QHED_{ij} / \Sigma^{+}QM_{ij} ;}$$

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

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; 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:

$$\mathbf{QHED_{ij} = QH_{ij} - QNH_{ij}}$$

$$\mathbf{QH_{ij} = ALF_j * F_i}$$

$$\mathbf{QNH_{ij} = ZLF_{ij} * F_i}$$

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:

$$QCE_{iaj} = \mathbf{UQCE_{iaj} + AQHED_{iaj}}$$

where:

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

$$\mathbf{AQHED_{iaj} = QHED_{ij} * (QMPR_{iaj}/100)}$$

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:

$$QCE_{iaj} = \mathbf{UQCE_{iaj} + AQHED_{iaj}}$$

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

$$\mathbf{AQHED_{iaj} = QHED_{ij} - \sum_a AQHED_{iaj}}$$

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).