ELEXON

ISG/24/267

Meeting name	ISG
Date of meeting	28 January 2003
Paper Title	SUGGESTED AMENDMENTS TO CREDIT ASSESSMENT LOAD FACTOR (CALF) TREATMENT OF INTERCONNECTOR BM UNITS
Purpose of Paper	For Decision
Synopsis	An Interconnector User has queried whether the CALF methodology applied to Interconnector BM Units creates realistic estimates of Energy Indebtedness. This paper proposes alternative methodologies. ISG is invited to approve one of these methodologies or to determine and agree a more equitable methodology.

1. USE OF CALF AND GC/DC IN THE ENERGY INDEBTEDNESS CALCULATION

1.1 The system parameter of Credit Assessment Load Factor (CALF), as described in section M.1.5 of the BSC, is central to the determination of a Trading Party's Energy Indebtedness. The amount of Credit Cover that a BSC Party is required to lodge to cover their Energy Indebtedness is calculated from a combination of Actual Energy Indebtedness (AEI) and Credited Energy Indebtedness (CEI), with the latter used for that portion of the 29 day period for which Interim Information Settlement Run data is not available. This calculation is prescribed in Section M, 'Credit Cover and Credit Default', of the BSC, and is briefly outlined below.

1.2 Credited Energy Indebtedness is calculated as:

$$CEI_{pj} = -\left(\sum_{a,i} CAQCE_{iaj} - {}_{a}QABC_{aj} \right)$$

1.3 With Credit Assessment Credited Energy Volume (CAQCE) for the Lead Energy Account for a Production BM Unit defined as:

$$CAQCE_{iaj} = (SPD * BMCAEC_i) - {}_{a}CAQCE_{iaj}$$

1.4 With CAQCE for the Lead Energy Account for a Consumption BM Unit defined as:

$$CAQCE_{iaj} = (SPD * BMCAIC_i) - {}_{a}CAQCE_{iaj}$$

1.5 With BM Unit Credit Assessment Export Capability (BMCAEC) defined as:

$$BMCAEC_i = CALF_i * GC_i$$

1.6 With BM Unit Credit Assessment Import Capability (BMCAIC) defined as:

$$BMCAIC_i = CALF_i * DC_i$$

1.7 With Generation Capacity (GC) defined as:

$$GC = G / SPD$$

Where G is the value of positive QM_{ij} notified under clause K 3.4.1(a) in relation to the relevant BSC Season.

1.8 With Demand Capacity (DC) defined as:

$$DC = D / SPD$$

Where D is the value of negative QM_{ij} notified under clause K 3.4.1(b) in relation to the relevant BSC Season.

1.9 BSC clause K 3.4.1 obliges the Lead Party of a BM Unit to notify the CRA in good faith, and as accurately as they reasonably can, of the maximum positive and negative values of QM_{ij} on a seasonal basis.

1.10 A CALF value is determined for each BM Unit in relation to every BSC Season. The principles by which CALF values are calculated for each BM Unit are defined in the CALF Guidelines document, which is published on the ELEXON website.

1.11 The magnitude of BMCAEC or BMCAIC will be dependent on the CALF value calculated and the magnitude of GC and DC values submitted.

2. CURRENT INTERCONNECTOR CALF METHODOLOGY

2.1 Prior to the Winter 2002/03 BSC Season CALF values for Interconnector BM Units were calculated using the following methodologies:

CALF values for Production Interconnector Error Administrator BM Units and Production Interconnector User BM Units were determined from the metered Production of that BM Unit and in the equivalent BSC Season of the previous year.

$$CALF = \frac{\text{average metered Production for the BSC Season (MWh)}}{\text{maximum metered Production for the BSC Season (MWh)}}$$

Where the average metered Production is defined as the total Production over the BSC Season divided by the number of Settlement Periods within that season. The maximum metered Production is defined as the maximum Production in any one Settlement Period during that BSC Season.

CALF values for Consumption Interconnector Error Administrator BM Units and Consumption Interconnector User BM Units were determined from the metered Consumption of that BM Unit in the equivalent BSC Season of the previous year.

$$CALF = \frac{\text{average metered Consumption for the BSC Season (MWh)}}{\text{maximum metered Consumption for the BSC Season (MWh)}}$$

Where the average metered Consumption is defined as the total Consumption over the BSC Season divided by the number of Settlement Periods within that season. The maximum metered Consumption is defined as the maximum Consumption in any one Settlement Period during that BSC Season.

2.2 ISG meeting 12 actioned ELEXON to review the methodology for determining CALF values for Interconnector BM Units, in order to identify potential changes to prevent significant over estimation of the maximum Generation or Demand on the Interconnector. ELEXON invited any guidance from ISG members on this action.

2.3 At ISG meeting 16 it was agreed that CALF values for Interconnector BM Units should be calculated using the following methodologies:

CALF values for Production Interconnector Error Administrator BM Units and Production Interconnector User BM Units were determined from the metered Production of that BM Unit and its declared GC in the equivalent BSC Season of the previous year.

$$\text{CALF} = \frac{\text{average metered Production for the BSC Season (MWh)}}{\text{declared Generation Capacity for the BSC Season (MW)}}$$

Where the average metered Production is defined as the total Production over the BSC Season divided by the number of Settlement Periods within that season.

CALF values for Consumption Interconnector Error Administrator BM Units and Consumption Interconnector User BM Units were determined from the metered Consumption of that BM Unit and its declared DC in the equivalent BSC Season of the previous year.

$$\text{CALF} = \frac{\text{average metered Consumption for the BSC Season (MWh)}}{\text{declared Demand Capacity for the BSC Season (MW)}}$$

Where the average metered Consumption is defined as the total Consumption over the BSC Season divided by the number of Settlement Periods within that season.

2.4 The original Interconnector methodology was reviewed when it became apparent that some Interconnector Users had set the GC/DC for their Interconnector BM Units to the full capacity of the Interconnector, even though not all Users can utilise the full capacity at any one time. ISG expressed concerns that full Interconnector capacity GC/DC values would effectively give a false impression of credit requirements when multiplied by CALF values calculated from the previous methodology. It was felt that determining CALF using GC and DC instead of maximum metered volume would eliminate the problem as it would make the credit calculation entirely dependent on historic average performance.

2.5 ELEXON implemented this decision with effect from the Winter 2002/03 BSC Season, having first sought and received an ISG correspondence decision confirming that this action should be taken.

3. PROBLEMS WITH THE CURRENT INTERCONNECTOR CALF METHODOLOGY

3.1 The current methodology divides a half hourly figure (in MWh) by an hourly figure (in MW). This generates CALF values that are half the magnitude of those that would be generated by using a

numerator and denominator derived over equivalent time-frames. This is illustrated in the worked examples of the current methodology contained in Appendix 2.

3.2 In addition, the estimation of an Interconnector User's Credited Energy Indebtedness for the current season is based upon their performance in the equivalent BSC Season of the previous year. Whilst this may be reasonable for some (if not most) classes of BM Unit, for Interconnector Users it can bear no relation to current performance, and may produce very low CALF values. The Interconnector User's past, present and future trading activity can vary significantly. This may be due to higher or lower Interconnector capacities won in the auctions, different trading strategies, or a reversal of marginal system costs in the two interconnected systems (as was the case between England and Wales and France last winter).

3.3 Finally, BMCAEC/BMCAIC are calculated using GC/DC values relating to the current BSC Season, but using CALF values defined using historical GC/DC values for the equivalent BSC Season for the previous year. Therefore if an Interconnector User changes their QM_{ij} submissions from one season to the next it will take four seasons before the new value flows through to their Credit Cover calculation.

3.4 BSC Clause M 1.5.3 states that ELEXON should give Parties at least 20 Business Days notice before making revised CALF values effective. ISG has further directed ELEXON to publish revised CALF values at least two months before each BSC Season commences in order that all appeals can be heard prior to these values being made effective.

3.5 BSCP15, which governs the submission of QM_{ij} values, specifies that these values do not need to be submitted until 10 Business Days prior to the commencement of the BSC Season.

3.6 This means it would not be possible to utilise GC/DC values relating to the BSC Season for which CALF is being calculated in the current methodology. Such a change would require either a Modification reducing the 20 business day notice period that ELEXON must give Parties of revised CALF values, or a CP increasing the 10 business day notice period for notifying revised QM_{ij} estimates under BSCP15 prior to the start of each season. For this reason no such methodology is suggested in this paper.

3.7 A combination of the above issues may necessitate Interconnector Users posting abnormally high Credit Cover to continue trading without triggering a Credit Default.

4. POSSIBLE REVISED METHODOLOGIES

4.1 There does not appear to be a flawless solution to this issue hence a number of potential methodologies are suggested.

4.2 The first seeks to address the disparity between numerator and denominator in the current calculation by multiplying GC/DC by the Settlement Period Duration (SPD). The second seeks to remove the issue of time-lag between the declaration of revised QM_{ij} figures and the use of these figures in the indebtedness calculation, by removing GC/DC from the CALF calculation. The third and fourth seek to base Class CALF values upon the reliability of the Interconnectors, with the opportunity of basing this upon either NGC Interconnector availability statistics or NETA Information Imbalance statistics.

4.3 None of these methodologies fully address the issue of volatility in metered volumes for Interconnector Users, which may make a static CALF value assigned throughout a BSC Season vary in its representativeness at any individual point during that season.

4.4 ISG may wish to consider whether there is any other methodology available that will produce more representative CALF values.

Methodology 1:

4.5 ISG may wish to modify the current methodology such that average metered volumes are divided by GC/2 or DC/2, dependent on P/C Status. This would remove the mismatch between the numerator and denominator described in paragraph 3.1. ELEXON suggests that the GC/DC value used in such a methodology should be the value in force at the commencement of the BSC Season preceding the BSC Season for which the CALF value is being calculated. This would not remove the time lag issue described in paragraph 3.5, but would reduce it from four seasons to one, assuming CALF values continue to be calculated approximately two and a half months prior to the start of the relevant BSC Season.

4.6 For the avoidance of doubt, the methodology proposed is:

CALF values for Production Interconnector Error Administrator BM Units and Production Interconnector User BM Units be determined from the metered Production of that BM Unit in the equivalent BSC Season of the preceding year and its declared GC at the start of the preceding BSC Season.

$$\text{CALF} = \frac{\text{average metered Production for the BSC Season (MWh)}}{\text{(Generation Capacity (MW) * SPD)}}$$

Where the average metered Production is defined as the total Production over the equivalent BSC Season divided by the number of Settlement Periods within that season.

Where the Generation Capacity used is the value in force at the commencement of the BSC Season preceding the BSC Season for which the CALF value is being calculated.

CALF values for Consumption Interconnector Error Administrator BM Units and Consumption Interconnector User BM Units be determined from the metered Consumption of that BM Unit in the equivalent BSC Season of the preceding year and its declared DC at the start of the preceding BSC Season.

$$\text{CALF} = \frac{\text{average metered Consumption for the BSC Season (MWh)}}{\text{(Demand Capacity (MW) * SPD)}}$$

Where the average metered Consumption is defined as the total Consumption over the equivalent BSC Season divided by the number of Settlement Periods within that season.

Where the Demand Capacity used is the value in force at the commencement of the BSC Season preceding the BSC Season for which the CALF value is being calculated.

Average CALF values that would have been calculated for Interconnector BM Units for the Winter 2002/03 and Spring 2003 BSC Seasons using this methodology are shown in Table 2.

Methodology 2:

4.7 ISG may wish to revert to the pre-Winter 2002/03 BSC Season CALF methodology for Interconnectors, as detailed in paragraph 2.1 of this paper.

4.8 This methodology would remove the time-lag between accurate GC/DC submission and these values being used in the Credit Cover calculation.

4.9 As outlined in paragraph 2.4 this methodology was abandoned due to concerns that it was not consistent with Users declaring the whole Interconnector Capacity as QM_{ij}. ISG may wish to consider what measures could be implemented to discourage this practice, should this methodology be favoured.

4.10 Average CALF values that would have been calculated for Interconnector BM Units for the Winter 2002/03 and Spring 2003 BSC Seasons using this methodology are shown in Table 3.

Methodology 3:

4.11 ISG may choose to assign generic Class[1] CALF values that reflect the physical availability of the Interconnector. NGC published statistics on the availability of the Interconnectors in its most recent Annual report. These are shown in Table 4.

4.12 Taking an average of the three years for which data was published gives an average availability of 96.67% for the French Interconnector and 98.97% for the Scottish Interconnector. These could be considered to be load factors for the Interconnector. ELEXON has calculated suggested Class CALF values from these figures, which are shown in Table 5.

4.13 This methodology would mean that P Status Interconnector BM Units will be treated as generating at a value close to GC in every Settlement Period, and would only incur positive Credited Energy Indebtedness in Settlement Periods where exports to England and Wales exceed BMCAEC. C Status Interconnector BM Units would be treated as consuming at a value close to zero, and would only incur positive Credited Energy Indebtedness in Settlement Periods where imports from England and Wales are smaller than BMCAIC. This would make it highly unlikely that an Interconnector BM Unit could incur positive Credited Energy Indebtedness. This methodology does not base CALF calculation upon the historical metered volumes of the individual BM Unit, which is the standard CALF methodology for most, although not all, BM Units. ISG may wish to consider whether this would result in Interconnector BM Units being treated more favourably for Credit Cover purposes than other types of BM Unit.

Methodology 4:

4.14 ISG may wish to assign generic Class CALF values based upon the difference between expected and actual metered volumes for Interconnector Users. ELEXON has investigated this principle,

1.1

[1] Four Classes are considered, French Production, French Consumption, Scottish Production and Scottish Consumption.

using data for the Autumn 2002 BSC Season (the most recent completed BSC Season at the time of writing).

4.15 Tables 6 to 9 show the level of absolute Information Imbalance for each Interconnector Class as a proportion of combined absolute FPNs and Bid-Offer Acceptances within that Class. Four generic Class CALFs are shown, each reflecting the likelihood of non-delivery of expected volumes.

4.16 This methodology would mean that P Status Interconnector BM Units will be treated as generating at a value close to GC in every Settlement Period, and would only incur positive Credited Energy Indebtedness in Settlement Periods where exports to England and Wales exceed BMCAEC. C Status Interconnector BM Units would be treated as consuming at a value close to zero, and would only incur positive Credited Energy Indebtedness in Settlement Periods where imports from England and Wales are smaller than BMCAIC. This would make it highly unlikely that an Interconnector BM Unit could incur positive Credited Energy Indebtedness. This methodology does not base CALF calculation upon the historical metered volumes of the individual BM Unit, which is the standard CALF methodology for most, although not all, BM Units. ISG may wish to consider whether this would result in Interconnector BM Units being treated more favourably for Credit Cover purposes than other types of BM Unit.

5. TIMING PRINCIPLES TO BE CONSIDERED

5.1 CALF values for the Winter 2002/03 and Spring 2003 BSC Seasons have already been notified to BSC Parties, on 11 October 2002 and 31 December 2002 respectively.

5.2 BSC Clause M 1.5.3 obliges ELEXON to give BSC Parties at least 20 Business Days notice before a revised value is made effective, therefore re-calculating and re-publishing Winter 2002/03 CALF values under any agreed revised methodology would not be practical, as these could not be made effective before the Season expired.

5.3 A revised methodology could be applied from the Spring 2003 BSC Season onwards with ELEXON re-calculating and re-publishing Interconnector BM Unit CALF values for that season. However, if an alternative methodology to those defined in this paper is agreed by ISG, it may not be possible to re-calculate and re-publish CALF values in sufficient time for them to be effective at the start of the Spring 2003 BSC Season.

5.4 As a consequence of this, it is recommended that the revised methodologies defined in this paper be made effective with effect from the Spring 2003 BSC Season. Any alternative methodologies would be made effective as agreed by ISG in consultation with ELEXON, subject to confirmation that such methodologies can be implemented in practice.

6. NECESSITY FOR DECISION

6.1 ELEXON considers the current Interconnector CALF methodology deeply flawed because of the numerator/denominator anomaly outlined in paragraph 3.1. ELEXON strongly recommends that if ISG cannot reach agreement on implementation of any of methodologies two to four, or any such other methodology as may be proposed during the meeting, that it should agree to the immediate implementation of methodology one to rectify this issue.

7. RECOMMENDATION

7.1 The ISG is invited to:

a) AGREE that the CALF methodology applied to Interconnector BM Units should be changed

and, if (a) is agreed, either

b) APPROVE one of the methodologies proposed in Section 4 of this paper be made effective from the Spring 2003 BSC Season

or, if (a) is agreed but (b) is rejected

c) DETERMINE and APPROVE an alternative methodology with an appropriate effective date

or, if (a) is rejected,

d) RE-AFFIRM the existing methodology

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Appendices:

Appendix 1: Data tables
Appendix 2: Worked example of current CALF methodology

Appendix 1 - Data Tables

Table 1: Average CALF values assigned to Interconnector BM Units for Winter 2002/03 and Spring 2003 BSC Seasons

Season	French P Status	French C Status	Scottish P Status	Scottish C Status
Winter 2002/03	0.1056	0.0343	0.1978	0.0016
Spring 2003	0.1417	0.0076	0.1370	0.0000
Average	**0.1237**	**0.0210**	**0.1674**	**0.0008**

Table 2: Average CALF values that would have been assigned to Interconnector BM Units for Winter 2002/03 and Spring 2003 BSC Seasons using Methodology 1:

Season	French P Status	French C Status	Scottish P Status	Scottish C Status
Winter 2002/03	0.2112	0.0686	0.3956	0.0032
Spring 2003	0.2834	0.0152	0.2740	0.0000
Average	**0.2474**	**0.0420**	**0.3348**	**0.0004**

Table 3: Average CALF values generated for Interconnector BM Units for Winter 2002/03 and Spring 2003 using Methodology 2, both including and excluding Interconnector Error Administrator BM Units

Season	French P Status	French C Status	Scottish P Status	Scottish C Status
Winter 2002/03, excluding IEAs	0.1933	0.0291	0.6311	0.0040
Winter 2002/03, including IEAs	0.1727	0.0268	0.4986	0.0187
Spring 2003, excluding IEAs	0.1945	0.0138	0.4585	0.0000
Spring 2003, including IEAs	0.1798	0.0142	0.3638	0.0255
Average, excluding IEAs	**0.1939**	**0.0215**	**0.5448**	**0.0020**
Average, including IEAs	**0.1763**	**0.0410**	**0.4312**	**0.0221**

Table 4: Interconnector availability, as declared by NGC in their Financial Year 2001/02 Report and Accounts (each Financial Year was considered to start on 1 April and finish on 31 March)

Year	French Interconnector	Scottish Interconnector
1999/2000	95.5%	99.9%
2000/2001	96.6%	99.8%
2001/2002	97.9%	97.2%
Average	**96.67%**	**98.97%**

Table 5: Suggested CALF values based upon NGC declared Interconnector availability, as shown in Table 3 (application of Methodology 2)

Interconnector Type	Class CALF
P Status French Interconnector	0.9667
C Status French Interconnector	0.0333 [calculated as 1 – 0.9667]
P Status Scottish Interconnector	0.9897
C Status Scottish Interconnector	0.0103 [calculated as 1 – 0.9897]

Table 6: French P Status Interconnector BM Unit performance, Autumn 2002 BSC Season, with suggested Class CALF based upon delivery of expected volumes (Methodology 3)

(A) Information Imbalance (absolute, in MWh)	61,561
(B) Aggregate FPNs (absolute, in MWh)	2,822,315
(C) Aggregate BOAs (absolute, in MWh)	0
(D) Non delivery: (A) / ((B) + (C))	2.18%
Suggested Class CALF: 1 – (D)	**0.9782**

Table 7: French C Status Interconnector BM Unit performance, Autumn 2002 BSC Season, with suggested Class CALF based upon delivery of expected volumes (Methodology 3)

(A) Information Imbalance (absolute, in MWh)	4,060
(B) Aggregate FPNs (absolute, in MWh)	327,661
(C) Aggregate BOAs (absolute, in MWh)	0
(D) Non delivery: (A) / ((B) + (C))	1.24%
Suggested Class CALF: (D)	**0.0124**

Table 8: Scottish P Status Interconnector BM Unit performance, Autumn 2002 BSC Season, with suggested Class CALF based upon delivery of expected volumes (Methodology 3)

(A) Information Imbalance (absolute, in MWh)	3,204
(B) Aggregate FPNs (absolute, in MWh)	1,232,937
(C) Aggregate BOAs (absolute, in MWh)	264,492
(D) Non delivery: (A) / ((B) + (C))	0.21%
Suggested Class CALF: 1 – (D)	**0.9979**

Table 9: Scottish C Status Interconnector BM Unit performance, Autumn 2002 BSC Season, with suggested Class CALF based upon delivery of expected volumes (Methodology 3)

(A) Information Imbalance (absolute, in MWh)	1,093
(B) Aggregate FPNs (absolute, in MWh)	156,067
(C) Aggregate BOAs (absolute, in MWh)	39,500
(D) Non delivery: (A) / ((B) + (C))	0.56%
Suggested Class CALF: (D)	**0.0056**

Appendix 2 – example of current CALF methodology, showing two scenarios: that an erroneously high QM_{ij} continues to be submitted, and that a corrected QM_{ij} is submitted

Common assumptions to both scenarios:

Interconnector BM Unit I_IFG-EXAMPLE has constant metered volumes of 50 MWh per Settlement Period, and bilateral contract volumes matching this amount. For the equivalent BSC Season of the preceding year it declared a positive QM_{ij} of 1,000 MWh.

Scenario 1:

Additional Scenario 1 assumption: I_IFG-EXAMPLE continues to have an erroneously high declared QM_{ij} value of 1,000.

GC will be calculated as:

GC = G / SPD

GC = 1,000 / 0.5

GC = 2,000

CALF will be calculated as:

$$CALF = \frac{\text{average metered Production for the equivalent BSC Season (MWh)}}{\text{declared Generation Capacity for the equivalent BSC Season (MW)}}$$

CALF = 50 / 2000

CALF = 0.0250

BMCAEC will be calculated as:

BMCAEC = CALF x GC

BMCAEC = 0.0250 x 2,000

BMCAEC = 50 MW

CAQCE will be calculated as:

CAQCE = SPD * BMCAEC

CAQCE = 0.5 * 50

CAQCE = 25 MWh

CEI for a Settlement Period will be calculated as:

CEI = -(CAQCE – QABC)

CEI = -(25 – 50)

CEI = 25 MWh

Scenario 2:

Additional Scenario 2 assumption: I_IFG-EXAMPLE re-declares a realistic QMij value of 50 MWh.

GC will be calculated as:

GC = G / SPD

GC = 50 / 0.5

GC = 100

CALF will be calculated as:

CALF = average metered Production for the equivalent BSC Season (MWh)
declared Generation Capacity for the equivalent BSC Season (MW) *

CALF = 50 / 2000 *

CALF = 0.0250

* Note that GC value for equivalent BSC Season of the preceding year is used in accordance with the prevailing CALF Guidelines.

BMCAEC will be calculated as:

BMCAEC = CALF x GC

BMCAEC = 0.0250 x 100

BMCAEC = 2.50 MW

CAQCE will be calculated as:

CAQCE = SPD * BMCAEC

CAQCE = 0.5 * 2.50

CAQCE = 1.25 MWh

CEI for a Settlement Period will be calculated as:

CEI = -(CAQCE – QABC)

CEI = -(1.25 – 50)

CEI = 48.75 MWh