Synchronous Area Framework Agreement for Regional Group Continental Europe
Annex 3: Policy on Accounting and
Settlement

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Synchronous Area Framework Agreement for Regional Group Continental Europe

#### INTRODUCTION

This document is part of the Synchronous Area Framework Agreement for the Synchronous Area CE (SA CE).

All times mentioned in this document are related to CET respectively CEST. Additional details of the Accounting and Settlement Process are described in the following documents:

- RGCE Implementation Guide Accounting and Settlement including appendices 1 and 2 (as subsequently amended) and
- ENTSO-E Guide for Agreement on Data Exchange Process for Accounting of Unintentional Deviation (as subsequently amended),

currently published on https://www.entsoe.eu/publications/electronic-data-interchange-edi-library/.

## A METHODOLOGIES, CONDITIONS AND VALUES SUBJECT TO ALL REGULATORY AUTHORITIES APPROVAL

The following section includes all methodologies, conditions and values jointly developed by all TSOs from the Synchronous Area CE and which are subject to approval by all regulatory authorities.

# A-1 COMMON SETTLEMENT RULES APPLICABLE TO INTENDED EXCHANGES OF ENERGY ACCORDING TO ARTICLE 50(3) EBGL (MANDATORY & NRA APPROVAL)

The SAFA Parties acknowledge that the proposal "All continental European TSOs' proposal for common settlement rules for intended exchanges of energy as a result of the frequency containment process and ramping period in accordance with the Article 50(3) of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing" that has been approved according to Article 4 EBGL on 09 March 2020 and submitted for approval to the competent regulatory authorities in accordance with Article 5(3) EBGL is accepted by all Parties subject to approval of the competent regulatory authorities. The Parties agree to apply this methodology as it is approved by the TSOs regardless of the fact that it has not been approved by the NRAs, while taking into account that it may be subject to a Request for Amendment.

Amendment Proposals that will be developed on the basis of a Request for Amendments by the relevant regulatory authorities according to Article 6 of the EB GL will be processed by applying the regular amendment rules according to Article 14 of the SAFA.

# A-2 COMMON SETTLEMENT RULES APPLICABLE TO ALL UNINTENDED EXCHANGES OF ENERGY ACCORDING TO ARTICLE 51(1) EBGL (MANDATORY & NRA APPROVAL)

The SAFA-Parties acknowledge that the document "All continental European TSOs' proposal for common settlement rules for all unintended exchanges of energy in accordance with Article 51(1) of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing" that has been approved according to Article 4 EBGL on 09 March 2020 and submitted for approval to the competent regulatory authorities in accordance with Article 5(3) EBGL is accepted by all Parties subject to approval of the competent regulatory authorities. The Parties agree to apply this methodology as it is approved by the TSOs regardless of the fact that it has not been approved by the NRAs, while taking into account that it may be subject to a Request for Amendment.

Amendment Proposals that will be developed on the basis of a Request for Amendments by the relevant regulatory authorities according to Article 6 of the EB GL will be processed by applying the regular amendment rules according to Article 14 of the SAFA.

# B METHODOLOGIES, CONDITIONS AND VALUES SUBJECT TO APPROVAL BY ALL TSOS

The Parties acknowledge that at the moment of entry into force of the Agreement there is no obligation arising from the applicable legislation according to Article 2.1 of the SAFA to include Part B within the subject scope of the Policy on Accounting and Settlement.

## C METHODOLOGIES, CONDITIONS AND VALUES AGREED AMONG THE MEMBERS OF RGCE

The following section includes all methodologies, conditions and values which are jointly developed and agreed among the SAFA parties.

#### C-1 DEFINITIONS

#### C-1-1 ACCOUNTING PROCESS

The Accounting Process is the validation of the metered data (usually located at an interconnecting Tie-Line of a TSO) and of the resulting Accounting Data. The purpose of the daily accounting is to provide a validated set of Accounting Data to the Co-ordination Centres in order to calculate every day the actual state of the Account of Unintentional Deviation.

TSOs have to finish the daily accounting process on the first working day after energy delivery, except in cases of unavailability of accounting offices (see C-3-3) or data mismatch (see C-3-8 and C-5-6). It starts with the initial exchange of metered data between neighbouring TSOs, continues with the establishment of the Accounting Data, and the transmission of the resulting data up to the Co-ordination Centres (and in some cases LFC Block Operators) and finishes with the exchange of the Accounting Data between the Co-ordination Centres.

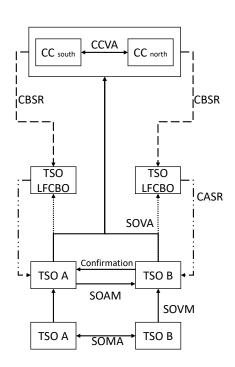
The weekly Accounting Process is identical to the daily process with the exception that it ends at the deadline for the weekly Accounting Process.

#### C-1-2 SETTLEMENT PROCESS

A distinction must be drawn between daily and weekly settlement. The daily settlement starts after the daily Accounting Process. It is the calculation of the Unintentional Deviation and the update of the state of the Account of Unintentional Deviation per LFC Block, LFC Area or Coordination Centre. It is finalised by the transmission of the settlement report from Co-ordination Centre to LFC Block, and in some cases from LFC Block to LFC Area.

The weekly Settlement Process is similar to the daily one. It covers the correction of daily settlement (if any) and the calculation of the Compensation Program of Unintentional Deviations on the state of the final account at the end of the Recording Period. The Settlement Process goes from Co-ordination Centre to LFC Block and in some cases from LFC Block to LFC Area. The basis for the Settlement Process is the Aggregated Netted External Schedules and Accounting Data on the LFC Block level.

Figure 1 shows the workflow for the Accounting Process and Settlement Process.



Document	Name	Contains
SOMA	System Operator Meter Alignment	Metered TL + VTL data
SOVM	System Operator Validated Measurements	Validated TL + VTL data
SOAM	System Operator Accounting data Matching	Accounting TL +VTL data
SOVA	System Operator Validated Accounting data	Accounting TL +VTL data
CBSR	Control Block Settlement Report	Accounting TL + VTL data + Schedules + Unintentional deviation + Compensation program
CASR	Control Area Settlement Report	Accounting TL + VTL data + Schedules + Unintentional deviation + Compensation program
CCVA	Coordination Centre Validated Accounting data	Accounting TL + VTL data + Schedules + Unintentional deviation

Symbol	Name						
СС	Coordination Centre (Accounting and Settlement entity)						
TSO LFCBO	TSO LFCBO TSO in role of LFC Block Operator						
<b>→</b>	Required Accounting Process data exchange						
	Optional Accounting Process data exchange						
>	Required Settlement Process data exchange						
+	Optional Settlement Process data exchange						

Figure 1: Accounting and Settlement Process flow

#### C-1-3 Cross-Border Energy Exchanges

The cross-border energy exchange consists of the following:

$$E_{ex} = E_{VTL} + E_{sch} + E_{UD}$$

#### Cross-border flows $E_{ex}$

The sum of the cross-border Tie-Line flows on a border between two TSOs / LFC Areas / LFC Blocks / Co-ordination Centres, as taken from the Accounting Data.

#### Virtual tie-line exchanges $E_{VTL}$

Virtual Tie-Line is defined in SOGL. The energy exchanged through Virtual Tie-Lines can be manual Frequency Restoration Reserves, automatic Frequency Restoration Reserves and Imbalance Netting. Moreover, there might be other processes that use Virtual Tie-Lines for the exchange of energy. Virtual tie-line exchanges are recorded in the accounting data.

#### Aggregated netted external schedules $E_{sch}$

This means the cross-border energy exchange through Aggregated Netted External Schedules (ANES) according to SOGL. This includes the cross-border energy exchanged through Replacement Reserves as well.

#### Unintentional deviation $E_{UD}$

This means the Unintentional Deviation.

The Compensation Program is included in the schedules, but is not considered for accounting and by this not considered in the calculation of Unintentional Deviation.

All energy exchanges are applied for borders between areas "k" und "l" at time t, as follows:

$$E_{kl}(t) = -E_{lk}(t)$$

#### C-1-4 COMPENSATION PROGRAM

The Compensation Program is included in the schedules and, as such, an additional input to the LFC Controller. The aim of the Compensation Program is to compensate the Unintentional Deviations of the previous Recording Period.

The procedure to determine the Compensation Programs is the scope of the Policy on Accounting and Settlement.

#### C-1-5 METER MEASUREMENT DATA

The physical energy exchange is registered per Tie-Line, by meter devices installed at substations, which are located at the end of the Tie-Line. There must be at least one main meter device and up to "n" back up meter devices per Tie-Line.

#### C-1-6 ACCOUNTING POINT

The Accounting Point is the agreed energy delivery point between two TSOs. The accounting value may be equal to a physical metered data or calculated by using meters on both sides. The algorithm for this calculation and the applied rounding rules are agreed between adjacent TSOs. There must be only a single Accounting Point per Tie-Line.

In case of a Virtual Tie-Line, the location of the Accounting Point is agreed bilaterally between adjacent TSOs. The power flows of the TSOs can also be based on values which are agreed upon between the involved TSOs and are considered in the Accounting Process.

#### C-1-7 ACCOUNTING DATA

Accounting Data is the result of an agreement between two TSOs. One TSO proposes the values using the predefined rules below, and the second TSO confirms the proposed values.

Accounting data is derived from validated metered data in one of the following ways (as agreed upon between TSOs sharing a Tie-Line):

- one to one copy of the meter measurement data (located at the accounting point),
- a calculation using a given formula, and either one or more meter measurement data (e.g. in order to consider line losses).

Accounting data is considered as a value per Tie-Line.

Virtual Tie-Lines are included in the Accounting Data and must be considered as shown in Figure 2. The physical energy exchange between LFC Area 1 and LFC Area 2 is measured by M1+M2 and includes the physical flow measured by M3. The measurement M3 is used as an offset to the set-point of the LFC Controller. Additionally, it must be subtracted from the Accounting Data for accounting.

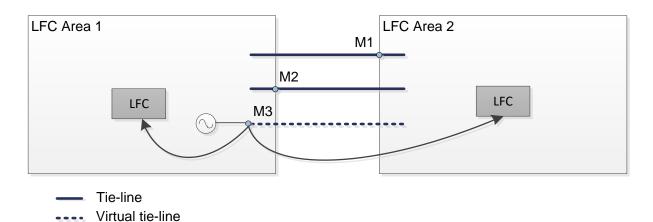


Figure 2: The consideration of virtual tie-line

#### C-1-8 WORKING DAY

Accounting point

The Working Day is the calendar day except Saturdays, Sundays and 4 holidays: Christmas day (25th of December), New Year's day (1st of January), Easter Monday and Ascension Day.

#### C-1-9 ACCOUNT OF UNINTENTIONAL DEVIATION

The Account of Unintentional Deviation is the sum of all past Unintentional Deviations corrected by the values of the Compensation Program. It is defined per Tariff Period. It is calculated cumulatively – the account is increasing / decreasing with each end of TSO-TSO settlement period for the respective Tariff Period.

Each Tariff Period has an Account of Unintentional Deviation. The connection between the Account of Unintentional Deviation ( $E_{UD \, account}$ ), the Unintentional Deviation ( $E_{UD}$ ) and Compensation Program ( $E_{CP}$ ) for a specific TSO-TSO settlement period t is as follows:

$$E_{UD\ account}(t) = E_{UD\ account}(t-1) + E_{UD}(t) + E_{CP}(t)$$

#### C-1-10 TARIFF PERIOD

The Tariff Period is the time interval (e.g. season, holiday, working day, etc.) during which Unintentional Deviations are attributed the same value for offsetting by compensation in kind (see C-6-2). The accumulation of Unintentional Deviations within the Recording Period is performed separately for each Tariff Period.

The Tariff Periods consist of NT, HT, HHT (Winter), HHT1 (Summer) and HHT2 (Summer) and distinguish summer and winter period. For the definition of the Tariff Periods the related calendar day must be taken into account (see C-2-3 and Figure 3). A Tariff Period consists of up to several hours of a day.

#### C-1-11 RECORDING PERIOD

Recording Period is the time period for which Accounting Data and Aggregated Netted External Schedules are recorded for the SA CE Settlement Process. Unless otherwise agreed upon by

the Co-ordination Centres (see C-2-6), the Recording Period starts on Monday 00:00 and ends on Sunday 24:00 based on CET respectively CEST. (see C-2-3)

#### C-1-12 COMPENSATION PERIOD

Compensation Period is the time period, related to the Recording Period, during which the LFC Area is applying the Compensation Program of Unintentional Deviation. Unless otherwise agreed upon by the Co-ordination Centres (see C-2-6), the Compensation Period starts on Thursday 00:00 CET respectively CEST and ends on Wednesday 24:00 CET respectively CEST. (see C-2-3)

#### C-2 STANDARDS - GENERAL PROCESS OVERVIEW

#### C-2-1 OVERVIEW OF THE COMPENSATION PROGRAM

In the SA CE the Unintentional Deviations between TSOs are compensated by in kind payments. This means that, during the Compensation Period, energy is exchanged to compensate the Unintentional Deviation which occurred during the Recording Period. This exchange of energy is known as the Compensation Program.

#### C-2-2 Workflow for the accounting- and settlement process

The Accounting Data goes from TSO to a Co-ordination Centre. Where needed and agreed upon by the relevant TSOs, Accounting Data might also flow from TSO to an LFC Area and/or LFC Block. (see C-5-1)

The Unintentional Deviations as well as the related Compensation Programs are calculated and sent from a Co-ordination Centre to an LFC Block. Where needed and agreed upon by the relevant TSOs, data might also flow from an LFC Block to an LFC Area. Co-ordination Centres and LFC Blocks are responsible to split down the Account of Unintentional Deviation which finally results in Compensation Programs for LFC Block and LFC Area. (see C-6-2)

Each LFC Block and Co-ordination Centre has to ensure that there is no difference (or rounding difference) induced by the splitting. Rounding differences have to be taken by the TSO responsible for the calculation of the Compensation Program, i.e. the Co-ordination Centre respectively LFC Block Operator for the rounding differences after calculation of compensation programs for the LFC Blocks respectively LFC Areas. A small amount of energy, which cannot be compensated due to rounding, remains on the account of unintentional deviation.

#### C-2-3 RECORDING PERIOD, COMPENSATION PERIOD

The Accounting Process is based on the Recording Period m. The compensation of Unintentional Deviations is paid in kind within the Compensation Period m – as an import / export of the corresponding amount of energy per Tariff Period, that was accumulated in the Recording Period. Figure 3 gives an overview of this procedure.

The standard Recording Period is defined to comprise 7 days (one week), from Monday, 0:00 to Sunday 24:00, whereas the standard Compensation Period is defined to comprise 7 days (one week), from Thursday 0:00 to Wednesday 24:00 of the week following the Recording Period.

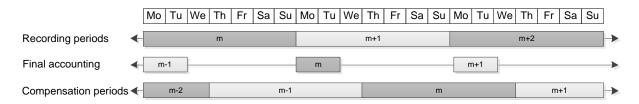


Figure 3: Recording Period, compensation Period

#### C-2-4 TARIFF PERIOD

The valid Tariff Periods in Continental Europe are indicated in Figure 4.

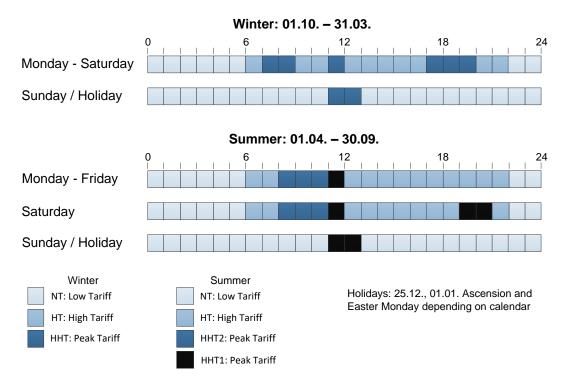


Figure 4: RGCE Tariff Periods

#### C-2-5 CONSIDERATION OF TIME SHIFT CET - CEST

For the day with a duration of 23 hours, the period from 02:00 to 03:00 shall not be considered. Therefore, the tariffs on this day shall be the tariffs for the period 00:00 to 02:00 and 03:00 to 24:00 as shown in Figure 4.

For the day with a duration period of 25 hours, the period from 02:00 to 03:00 shall be considered to be extended to two hours for the calculation. Therefore, the tariff on this day shall be applied using the tariffs for the period 00:00 to 03:00, additional 02:00 to 03:00 and 03:00 to 24:00 as shown in figure 5.

#### C-2-6 CHANGES OF STANDARD RECORDING AND COMPENSATION

In case of bank holidays or the change of tariff seasons exceptions to the standard Recording and Compensation Periods may occur. The Co-ordination Centres agree on exceptions to the definition of the Recording Period / Compensation Period. The Co-ordination Centres make a yearly plan for Recording Period and Compensation Period, taking into account national bank holidays and inform all LFC Blocks at least 3 months before beginning of the year. The LFC Blocks inform the associated LFC Areas. The following rules have to be taken into account:

- A Recording Period must last at minimum 4 days
- A Compensation Period must last at minimum 4 days
- The Compensation Period has to start always with a delay of at least three days after the end of the corresponding Recording Period.

#### C-3 STANDARDS - GENERAL RULES

#### C-3-1 ACCOUNTING AND SETTLEMENT PERIOD

The daily accounting and settlement is done for the day "D" on the next working day.

The weekly accounting and settlement is done for the Recording Period.

#### C-3-2 AVAILABILITY

Accounting offices have to be available on working days from 08:00 to 11:30 and 13:30 to 16:00 CET respectively CEST.

#### C-3-3 LOCAL EXCEPTIONS

In case of unavailability of an accounting office, e.g. system maintenance, the office in question must inform the upper SA CE level at least 4 weeks before.

#### C-3-4 Consideration of DC-Links

DC links between CE LFC areas will be considered in the SA CE Accounting and Settlement process, only if they are considered by both connecting TSOs in the exchange programs and in the LFC Controller.

DC links between synchronous areas cannot be considered in the SA CE accounting and settlement process.

#### C-3-5 MODIFICATION OF THE ACCOUNTING PROCESS AND RELATED DATA

The SAFA parties must provide the complete and correct information about all issues affecting the Accounting Process e.g. new or changes of tie lines (including DC-links and virtual tielines), changes of resolution and time frames etc.

In case of changes the requesting TSO must inform the affected TSO, LFC Area, LFC Block and Co-ordination Centre at least 30 days in advance by means of the registration form in C-10-5.

#### C-3-6 ROUNDING RULES

Generally, the data exchanged is in MWh. If all LFC Areas in an LFC Block agree, a mathematical rounding in kWh can be performed.

The Compensation Program of Unintentional Deviations of an LFC Block must be in full MW only. By default, the program for the Compensation of Unintentional Deviations for an LFC Area should be in MW but if all LFC Areas in an LFC Block agree, the program for the Compensation of Unintentional Deviations may be in kW.

The remaining amount of energy in kWh stays on the Account of Unintentional Deviations.

#### C-3-7 ELECTRONIC DATA EXCHANGE

Electronic data exchange for accounting and settlement is required using e-mail via EH. If the e-mail via EH is disturbed, an electronic back-up must be agreed such as e-mail via internet or ftp-dial in via ISDN-line. If electronic communication is generally disturbed, fax or phone must be used as last back-up.

#### C-3-8 TROUBLESHOOTING

If the weekly Accounting and Settlement Process cannot be performed like described, the affected SA CE body must inform immediately the related SA CE level above which then informs the related Co-ordination Centre latest until Tuesday 13:00. The Co-ordination Centres then inform until latest Tuesday 14:00 all SA CE LFC Blocks which inform the related LFC Areas immediately. Both Co-ordination Centres will agree on a solution and inform the related LFC Blocks latest until Tuesday 16:00. Then the LFC Blocks inform their related LFC Areas immediately.

#### C-3-9 TIME FRAME

The time frame for accounting of Unintentional Deviations has to correspond with the time frame of the exchange program (1h,  $\frac{1}{2}$ h,  $\frac{1}{4}$ h); this time frame applies to the frames for ANES, Accounting Data, VTL exchanges, Unintentional Deviations and the program for the Compensation of Unintentional Deviations. The time frame must be the same on a common border between two areas.

### C-4 STANDARDS - BILATERAL AGREEMENT FOR THE ACCOUNTING/SETTLEMENT PROCESS/FUNCTION

In order to perform the Accounting and Settlement Process in a correct manner the partners of a common border have to fix a bilateral accounting agreement taking into account the following document: ENTSO-E Guide for Agreement on Data Exchange Process for Accounting of Unintentional Deviation and including the following items:

#### C-4-1 LIST OF TIE-LINES, METER MEASUREMENT AND ACCOUNTING DATA

TSOs have to agree upon the list of Tie-Lines and Virtual Tie-Lines to be included in the SA CE Accounting Process according to the ENTSO-E Guide for Agreement on Data Exchange Process for Accounting of Unintentional Deviation. This list also has to provide information about meter measurement and Accounting Data. It must provide:

- Names of both involved TSOs
- Name of Tie-Lines
- Name and related TSO of substations Tie-Line is connecting
- List of measurement data to be used to derive the accounting value
- List of measurement data to be exchanged
- EIC for each meter measurement data to be exchanged
- EIC of accounting point
- If line losses to be considered, agreement on formula to calculate Accounting Data

This agreed list must be transmitted towards the related Co-ordination Centres for SA CE publication. The data from the Accounting Point must be used by all SA CE bodies involved as unique representation of the physical energy exchange concerning the Tie-Line.

#### C-4-2 DATA FORMAT

The SAFA parties have to use the data exchange format for metering, accounting and settlement:

- SOMA: System Operator Meter Alignment
- SOVM: System Operator Validated Measurements
- SOAM: System Operator Accounting Data Matching
- SOVA: System operator Validated Accounting data
- CBSR: Control Block Settlement Report
- CASR: Control Area Settlement Report
- CCVA: Coordination Centre Validated Accounting data

according to the RGCE Implementation Guide Accounting and Settlement (see Figure 1).

#### C-4-3 TROUBLE SHOOTING

In order to be prepared in case of problems, TSOs have to agree on the rules how to deal in case of trouble shooting (missing meter measurement data, inconsistent data, unavailable data, ...) In this case TSOs have to agree on a substitute value for every time unit in question and inform their related LFC Blocks or/and Co-ordination Centres immediately. (see C-7-1).

#### C-4-4 RESOLUTION.

TSOs must agree on the resolution for the validation of the energy exchange on their common border. The resolution for the exchange of meter measurement and Accounting Data is by default the integer value of MWh. If bilaterally agreed, MWh with 3 decimal digits for the time frame 1h,  $\frac{1}{2}h$  or  $\frac{1}{4}h$ .

#### C-4-5 CONSIDERATION OF LINE LOSSES

TSOs have to agree on the way to consider line losses. This can be done by agreement defining the Accounting Point e.g. on the basis of the Accounting Data according to RGCE Implementation Guide Accounting and Settlement and ENTSO-E Guide for Agreement on Data Exchange Process for Accounting of Unintentional Deviation.

#### C-5 STANDARDS - ACCOUNTING PROCESS/FUNCTION

#### C-5-1 WORKFLOW OF ACCOUNTING PROCESS

The workflow of the Accounting Process is described in the RGCE Implementation Guide Accounting and Settlement. The daily Accounting Process starts with the initial exchange of metered data between neighbouring TSOs, continues with the establishment of the Accounting Data, and the transmission of the resulting data to the respective Co-ordination Centre and finishes with the exchange of the Accounting Data between the Co-ordination Centres.

The weekly Accounting Process is identical to the daily process with the exception that it ends at the deadline for the weekly Accounting Process.

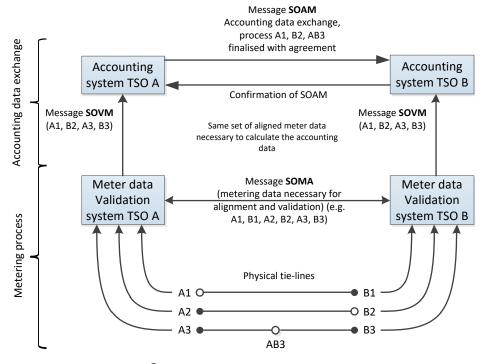
#### Timing of the daily accounting process

The daily Accounting Process is performed on the first working day after energy delivery with regards to the agreed calendar (see C-2-6). This implies that the daily Accounting Process cannot always be completely finalised on the same day for all the borders within SA CE. (see Table 1)

#### Timing of the weekly accounting process

The weekly Accounting Process is performed according to the timetable 2a on Mondays and Tuesdays. In case of national holidays, the Recording Period is adjusted in order to fulfil these requirements. The Co-ordination Centres organise in advance the weekly accounting calendar for the whole year. Therefore, every LFC Area Operator has to provide a list to the Coordination Centre Operator of Mondays and Tuesdays which are national holidays and / or days off.

#### C-5-2 ACCOUNTING DATA EXCHANGE BETWEEN TSOS IN THE SA CE



 Accounting points: A1, B2, AB3 – source can be main, back-up or pilot point meter device, but value can also be estimated (assume AB3 is calculated with the help of A3 and B3)

#### Figure 5: Overview of the Data Exchange Process between TSOs

#### Principles of meter measurement data exchange

Each TSO assembles and sends his meter measurement data document "System Operator Meter Alignment" (SOMA) to his adjacent TSO (see C-4-1, C-1-7 and Figure 5). Every TSO validates the contents of the SOMA document. The TSOs inform each other about the result of validation.

In case of successful validation, the meter measurement data document "System Operator Validated Measurements" (SOVM) is assembled and sent to the accounting data system of the TSO in order to calculate the accounting data (e.g. consideration of losses).

#### Principles of accounting data exchange between TSO

The calculated Accounting Data is assembled into a document "System Operator Accounting Data Matching" (SOAM) and must be exchanged between involved TSOs. One TSO sends the values that have been calculated and that will serve as the accounting point data. If the receiving TSO agrees to the values, then a positive acknowledgement is sent. If, however, the receiving TSO does not agree, then a negative acknowledgement is sent. Both TSOs send the SOAM after successful matching (SOVA) to the related Co-ordination Centres. If Accounting Data is based on substitute meter measurement data, the two involved TSO have time to adjust the data during the final weekly Accounting Process. If data is not adjusted by the TSO and they match, this data is considered as final on the dedicated SA CE border. If data do not match, the accounting mismatch rules (see C-7-1) will be applied by the dedicated SA CE level (see Table 1 and Table 2).

#### C-5-3 METERING REQUIREMENTS

The following metering requirements must be fulfilled by the metering devices on both ends of the Tie-Line by both connecting TSOs.

#### Voltage and current transformer

Voltage and current transformers have to be operated at each metering point which data is used as source for the determination of an Accounting Point. Voltage and current transformers at the Accounting Points must have an accuracy class rating of 0.2. Current transformers must have 2 cores for measurement purposes.

#### **Electricity metering**

On the basis of the current and voltage values measured by the transformers, the electricity meters determine the active energy flow in both directions related to a given time frame. The electricity meters at the accounting points must have an accuracy class rating of 0.2.

#### Redundancy

Metering points must be equipped with main and check meters at each Tie-Line. Main and check meter must be connected each to a separate core of the current transformer.

#### **Transformer cables**

Due to the accuracy of the whole metering, voltage transformer cables must be designed in such a way that a voltage drop is reduced to 0.1% or less of the nominal voltage.

#### **Telecounter**

The task of a telecounter is the acquisition of metered values from the electricity meters at the metering point and the teletransmission of this data to the central accounting office of every partner concerned (remote meter reading). The counters at a metering point must be doubled.

### C-5-4 AVAILABILITY AND TIMING FOR METER MEASUREMENT DATA EXCHANGE PROCESS

The SAFA parties must follow the deadlines outlined in Table 1 and Table 2.

#### C-5-5 AVAILABILITY AND TIMING OF ACCOUNTING DATA EXCHANGE PROCESS

The SAFA parties must follow the deadlines outlined in Table 1 and Table 2.

#### C-5-6 TROUBLESHOOTING PROCEDURE

The TSOs have to apply the agreed rules for troubleshooting (see C-7-1).

The TSO are obliged to send their available Accounting Data even if values do not match at deadline.

#### C-6 STANDARDS - SETTLEMENT PROCESS/FUNCTION

The daily Settlement Process starts after the finalisation of the daily Accounting Process according to Table 1. The resulting Unintentional Deviation and the update of the state of the account per LFC Area/LFC Block must be finalised and transmitted by means of the settlement report to LFC Areas/LFC Blocks by the LFC Block responsibles and Co-ordination Centres respectively.

The weekly Settlement Process starts after the finalisation of the weekly Accounting Process according to Table 2. The resulting Unintentional Deviation and the update of the state of the account per LFC Area/LFC Block must be finalised and transmitted by means of the settlement report to LFC Areas/LFC Blocks by the LFC Block responsibles and Co-ordination Centres respectively. The weekly Settlement Process includes the calculation and distribution of the Compensation Program of Unintentional Deviations. The Compensation Program of Unintentional Deviations is based on the final account at the end of the associated Recording Period.

#### C-6-1 UNINTENTIONAL DEVIATIONS

#### **Principles about Unintentional Deviations**

- The calculation is based on verified ANES and Accounting Data (original or substituted)
- The verified ANES for each delivery day (D) are exported from the Verification Platform to the Coordination Centres on the following calendar day (D+1) at 12:00 CET respectively CEST (see Table 1). The LFC Areas shall not send after this deadline updated ANES to the Verification Platform, without informing firstly the respective Co-ordination Centre (see C-7-3).
- The verified ANES are available at the accounting responsible of LFC Area, LFC Block and Co-ordination Centre.
- The accounting data are available at the accounting responsible of LFC Area, LFC Block and Co-ordination Centre.
- The Co-ordination Centres is splitting down the Account of Unintentional Deviation to the LFC Blocks. In some cases, the LFC Blocks split down the Account of Unintentional Deviations to the LFC Areas.

#### **Calculation of Unintentional Deviations**

The Unintentional Deviations  $E_{UD,kt}$  of an area (LFC Area, LFC Block, Co-ordination Centre) "k" and time unit "t" are calculated ex - post as difference between physical and scheduled energy exchange:

$$E_{UD,kt} = E_{ex,kt} - E_{VTL,kt} - E_{sch,kt}$$

 $E_{sch,kt}$  is the verified ANES for area k at time t (note: the Compensation Program for Unintentional Deviations is not included) as taken from the Verification Platform

 $E_{ex,kt}$  is the energy exchange on the basis of Accounting Data for area k at time t

 $E_{VTL,kt}$  is the sum of the Virtual Tie-Line flows included in the Accounting Data between area k and all other areas at time t

In the SA CE the sum of the Unintentional Deviations of all LFC Areas / LFC Blocks / Coordination Centres must be equal to zero:

$$\sum_{k} E_{UD,kt} = 0$$

The Unintentional Deviation is summed up per RGCE tariff.

The Unintentional Deviations of each area k (LFC Area, LFC Block, CC) are accumulated to an account  $E_{UD\ account,kt}\ (D,T)$  on the day D - under consideration of a pre-defined set of Tariff Periods T.

$$E_{UD\ account,kt}(D,T) = E_{UD\ account,kt}(D-1,T) + E_{UD,kt}(D,T) + E_{CP,km}(T)$$

#### C-6-2 COMPENSATION PROGRAM OF UNINTENTIONAL DEVIATIONS

#### Principles:

- The Compensation of Unintentional Deviations within the SA CE settlement process is currently achieved by an energy exchange program (non-monetary) called Compensation Program of Unintentional Deviations.
- The Compensation Program of Unintentional Deviation is a duty of a TSO towards the community of SA CE TSOs.
- For each time interval all Compensation Programs of all LFC Blocks must sum up to zero.
- The sum of all Compensation Programs of the LFC Areas within a LFC Block must be equal to the Compensation Program of the LFC Block.
- The sum of all Compensation Programs of the LFC Blocks within a Co-ordination Centre area must be equal to the Compensation Program of the related Co-ordination Centre.
- TSOs are obliged to comply with the Compensation Programs of the LFC blocks and LFC areas, as not doing so endangers system security in terms of frequency stability.

#### C-6-3 CALCULATION OF THE COMPENSATION PROGRAM

The Account of Unintentional Deviation per Tariff Period of each LFC Area is divided by the number of tariff hours of the Compensation Period. The result is mathematical rounded to full MW and the rest remains on the account.

With reference to the remaining compensation duties, RAC, of the previous Compensation Period, and the Recording Period "m": the Compensation Program  $E_{CP,km}(T)$  is calculated for each area "k" and Tariff Period "T" during final weekly settlement:

$$E_{CP,km}(T) = -round \left[ \frac{E_{UD\ account,km}(T) - RAC}{count(T)} \right]$$

 $E_{UD\ account,km}(T)$  are the accumulated deviations (current Recording Period). *RAC* are the remaining energy that should be delivered according to the previous compensation program. count(T) represents the number of hours referring to the tariff period T in the Compensation Period m.

If due to rounding this rule is not fulfilled, the SA CE body responsible for calculation of Unintentional Deviation has to take the remaining amount on its account.

Example of the splitting down of the Compensation Program of Unintentional Deviations from the Co-ordination Centres to the LFC Blocks please see C-10-4.

#### **Distribution of Compensation Programs**

The Compensation Programs are distributed from the Co-ordination Centres to the LFC Blocks and from the LFC Blocks to the LFC Areas. The distribution of the Compensation Program to the next lower SA CE level is managed through the weekly settlement reports from the Co-ordination Centre to LFC Block (CBSR) and from LFC block to LFC Area (CASR) according to the RGCE Implementation Guide Accounting and Settlement.

#### Timing of distribution of compensation programs

The distribution of the Compensation Program as part of the weekly settlement report has to take place after the weekly settlement process is closed according to the timetable. (see Table 2)

#### Nomination of compensation program

The nomination of the Compensation Program is based on the distributed program in the final weekly settlement report. The nomination is done daily (D-1) at the same time as fixed for SA CE scheduling and in accordance to the nomination process.

#### C-6-4 SETTLEMENT REPORTS

At the end of the Settlement Process the settlement report is generated. It shows mainly the Unintentional Deviation and the actual state of the individual account. There is a daily and a final weekly settlement report. The settlement reports are defined in the RGCE Implementation Guide Accounting and Settlement.

The settlement reports show data for the affected period of the relevant LFC Area/LFC Block in the SA CE agreed resolution (currently the SA CE tariff).

#### Contents and status of settlement report

The daily settlement report is generated daily, the weekly settlement report is generated weekly and is considered as final.

The report contains the following information:

Account of Unintentional Deviation with opening and closing position

#### Synchronous Area Framework Agreement for Regional Group Continental Europe

- Compensation position as basis for the next Compensation Program
- Compensation Program for the next Compensation Period (weekly report only)
- Scheduled Compensation program for the Recording Period
- Unintentional Deviation
- Real Tie-Line flows for each Tie-Line
- Intended energy exchange for each Virtual Tie-Line
- Scheduled energy exchange for each border

Examples are shown in the RGCE Implementation Guide Accounting and Settlement Appendix 2.

#### **Timing of settlement report**

See Table 1 and Table 2.

#### C-6-5 Publication in Vulcanus

After ending up with the SA CE weekly Settlement Process the agreed Accounting Data has to be published on the Vulcanus website.

#### C-6-6 EXTRAORDINARY MEASURES

For the years 2018 and 2019, according to RG CE Plenary decision, the compensation periods are prolonged to monthly compensation periods.

In addition to this, further extraordinary measures may be proposed and implemented by the Co-ordination Centres after approval by RG CE Plenary, especially in cases of violations of this Policy.

#### C-7 GUIDELINES

#### C-7-1 Troubleshooting for the accounting process.

In case of unavailability of meter measurement data or available data but not agreed on time, the following procedure is recommended in the following sequence:

- If available, use the check meter values from the Accounting Point substation.
- If available, use the main meter values from the adjacent substation.
- If available, use the check meter values from the adjacent substation.
- If available, use the integrated measurement values from the on-line observation
- Otherwise, the partners involved agree on the methodology to determine substitutes.
- In any case, more flexible procedure for troubleshooting can be agreed in a bilateral way among the affected TSOs, insuring the normal operation of the accounting process.

In case two SA CE bodies are sending mismatching Accounting Data to the Co-ordination Centre (and LFC Block where applicable) as part of the daily Accounting Process the Co-ordination Centre (and LFC Block where applicable) should immediately prepare a substitution of values in the following sequence:

- If both TSOs are sending accounting values having "small" mismatch (mismatch as a percentage of the average value, calculated as 2[(A1-B1)/(A1+B1)], up to 10%) to the Coordination Centre (and LFC Block where applicable), the Co-ordination Centre (and LFC Block where applicable) should use the average of both values as substitute value, where A1 = Accounting Data send for line 1 by TSO A and B1 = Accounting Data send for line 1 by TSO B.
- If both TSOs are sending accounting values having "large" mismatches or do not sent accounting values at all and telemeasurements of the tie-lines are available to the Coordination Centre (and LFC Block where applicable), the Co-ordination Centre (and LFC Block where applicable) should use telemeasurements as substitute value.
- If both TSOs are sending accounting values having "large" mismatches or do not send accounting values at all and telemeasurements are NOT available to Co-ordination Centre (and LFC Block where applicable), the Co-ordination Centre shall communicate with the affected TSOs to determine the cause of the missing data and find a solution. In case a solution cannot be found, the Co-ordination Centre shall set the accounting value to zero.

#### C-7-2 TIMEFRAME FOR CHANGING THE ACCOUNTING DATA

All substituted values and/or all already matched values can be changed until the end of the deadline of the weekly Accounting Process (see C-5-1). After the end of the weekly Accounting Process, the Accounting Data cannot be changed anymore.

#### C-7-3 TIMEFRAME FOR CHANGING THE VERIFIED ANES

The verified ANES can be changed by the concerned LFC Areas until the end of the deadline of the weekly Accounting Process (see C-5-1). In such cases, the concerned LFC Areas shall firstly inform the respective Coordination Centre and then send their updated ANES to the Verification Platform. The respective Coordination Centre will then manually export the updated and verified ANES, recalculate the Unintentional Deviations of the concerned LFC Blocks and resend the updated daily settlement report(s). After the end of the weekly Accounting Process, the verified ANES cannot be changed anymore.

#### C-8 ENTITIES

The accounting and settlement entities for the Compensation Program will be assigned by RG CE in accordance with the SAFA Article 15 decision making process in execution of the Annexes to the Agreement.

There will be an entity assigned for the southern block of SA CE and one entity for the northern block of SA CE.

#### C-9 TRANSITORY PROVISION

The Parties agree that any due account of Unintentional Deviations under MLA OH at the time of termination of MLA OH will be due under SAFA as of entry into force of SAFA, under the conditions set out in this Policy.

#### C-10 APPENDIX

#### C-10-1 EQUATION TERMS

 $E_{ex}$  sum of cross-border Tie-Line flows between two TSOs/LFC Areas/LFC

Blocks/Co-ordination Centres

 $E_{VTL}$  intended cross-border exchanges through VTL

 $E_{sch}$  cross-border energy exchange through ANES

 $E_{UD}$  Unintentional Deviation

 $\Delta P$  power control error. Defined in SOGL

 $E_{UD\ account}$  Account of Unintentional Deviation used in the Compensation Program

 $E_{CP}$  Compensation Program

#### C-10-2 TIMETABLES FOR DAILY ACCOUNTING AND SETTLEMENT PROCESS

#### Table 1: Timetable for daily accounting and settlement process

Note: the following timing (if not expressed different) is valid for the next workday

Timetable a: Timing of daily data delivery exchange					or more
	data only for one day			than one Day	
				(e.g. after weekend, holidays, etc.)	
Action	Gate closure	Cut Off time (Agreement deadline)		Gate closure	Cut Off time (Agreement deadline)
Meter data delivery (SOMA) to neighbouring TSO	10:00 AM	1:00 PM		10:00 AM	1:00 PM
Delivery of ANES from VP to Co-ordination Centre <sup>1</sup>		12:00 PM			
Accounting data delivery (SOAM) to neighbouring TSO	1:30 PM	2:00 PM		1:30 PM	4:00 PM
Delivery of agreed Accounting Data (SOVA) by TSO to LFC Area Note: if disagreement: available data have to be send		2:00 PM			4:00 PM
Delivery of agreed Accounting Data (SOVA) to LFC Block		2:00 PM			4:00 PM
Delivery of agreed Accounting Data (SOVA) to Co-ordination Centre		2:00 PM			4:00 PM
Accounting Data delivery to neighbouring Co-ordination Centre		3:15 PM			5:15 PM

Timetable b: Timing for delivery of daily settlement report	Data for only one day	Data for more than one Day (e.g.after week-end, holidays, etc.)
Action	Deadline	Deadline
Exchange of report (CCSRd) between Co-ordination Centre  Delivery of report (CBSRd) by Co-ordination Centre to LFC Block	3:45 PM 4:00 PM	Tu 10:00 AM Tu 10:15 AM
Delivery of report (CASRd) by LFC Block to LFC Area	4:15 PM	Tu 10:30 AM

<sup>&</sup>lt;sup>1</sup> The timing is valid for the next calendar day

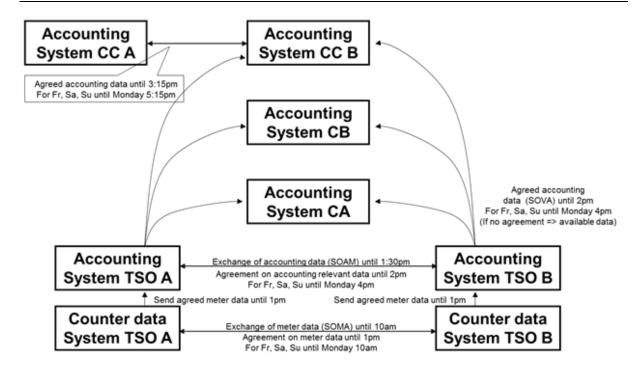


Figure 6. Timing of daily Accounting Data exchange

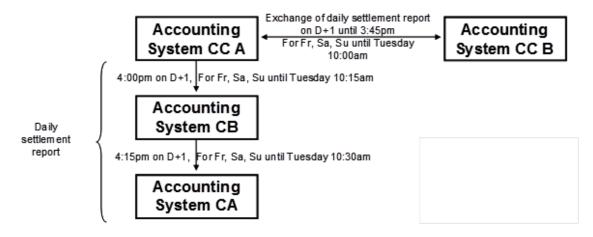


Figure 7. Timing of daily settlement report

#### C-10-3 TIMETABLES FOR WEEKLY ACCOUNTING AND SETTLEMENT PROCESS

#### Table 2: Timetable for weekly accounting and settlement process

Note: the following timing is valid for Tuesday respectively the next working day after Tuesday

Timetable a:Timing of final weekly accounting data delivery (SOVA)	
Action	Cut Off time (Agreement deadline)
Accounting Data delivery (SOAM) to neighbouring TSO	1:00 PM
Delivery of agreed Accounting Data (SOVA) by TSO to LFC Area	1:30 PM
Delivery of agreed Accounting Data (SOVA) to LFC Block	1:30 PM
Delivery of agreed Accounting Data (SOVA) to Co-ordination Centre	1:30 PM
Accounting Data delivery to neighbouring Co-ordination Centre	2:15 PM

Timetable b: Timing for delivery of weekly settlement report including programs for compensation of unintentional deviations	
Action	Deadli
Exchange of report (CCSRw) between Co-ordination Centres	3:30 F
Delivery of report (CBSRw) by Co-ordination Centre to LFC Block	4:00 F
Delivery of report (CBSRw) by LFC Block to LFC Area	4:30 F

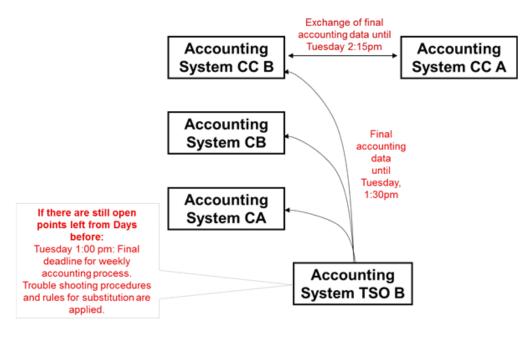


Figure 8. Timing of final weekly Accounting Data

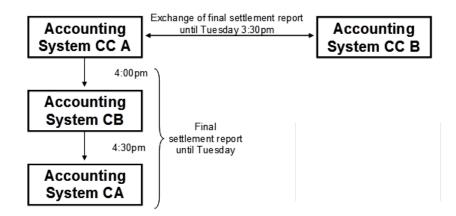


Figure 9. Timing for final weekly settlement report including the Compensation Program of Unintentional Deviations

### C-10-4 Example for splitting down of the Compensation Program of Unintentional Deviations

The following examples show the derivation of the Compensation Programs of Unintentional Deviations for the recording period 13.11.2006 to 19.11.2006 and tariff H1 for the Control Blocks in Co-ordination Centre- South and North as well as for the LFC Areas in LFC Block Germany.

The table below show the split of the Compensation Program of Unintentional Deviations between the LFC Blocks in Co-ordination Centre South.

Table 3: Example for compensation program of unintentional deviation (Co-ordination Centre North)

	Rounding	to full MW		Rounding to for	ull MW after r	ounding error a	ssigned to CH	
Recording period		13.1	1.2006 - 19.11.2	006	Recording period		13.1	1.2006 - 19.11.2
Tariff			H1		Tariff			H1
Tariff hours in compensation p	period		10		Tariff hours in compensation per	riod		10
Name of Co-ordination Centre or LFC block	Account before compensation (MWh)	Not yet delivered compensation (RAC) (MWh)	Compensation schedule (MW)	Account after compensation (MWh)	Name of Co-ordination Centre	Account before compensation (MWh)	Not yet delivered compensation (RAC) (MWh)	Compensation schedule (MW)
Co-ordination Centre North	651.043	-10.000	66.000	1.043	Co-ordination Centre North	651.043	-10.000	66.000
LFC block 1	776.000	20.000	76.000	-4.000	LFC block 1	776.000	20.000	76.000
LFC block 2	-461.000	20.000	-48.000	-1.000	LFC block 2	-461.000	20.000	-48.000
LFC block 3	-452.040	-10.000	-44.000	-2.040	LFC block 3	-452.040	-10.000	-44.000
LFC block 4	135.000	10.000	13.000	-5.000	LFC block 4	135.000	10.000	13.000
LFC block 5	-232.000	-10.000	-22.000	-2.000	LFC block 5	-232.000	-10.000	-22.000
LFC block 6	-60.000	30.000	-9.000	0	LFC block 6	-60.000	30.000	-9.000
СН	-357.003	-50.000	-31.000	2.997	СН	-357.003	-50.000	-32.000
Total	0	0	1.000	-10.000	Total	0	0	0
Co-ordination Cer	ntre South delta (M	MW)	-1.0	000	Co-ordination Centre South	delta covered	by CH (MW)	-1.0
Total of Co. ordination C	antra South in ta	riff (MAA/Is)	10	000	Total of Co. ordination Contro Sou	th in tariff cove	rod by CH (MWb)	10

Like illustrated Switzerland as Co-ordination Centre south responsible LFC Block has to take over the rounding differences after calculation of compensation programs of the LFC Blocks.

The table below shows the split of the Compensation Program of Unintentional Deviations between the LFC Blocks in Co-ordination Centre North.

.2006

-4.00 -1.00 -2.04 -5.00

Table 4: Example for compensation program of unintentional deviation (Co-ordination Centre South)

Rounding to full MW						
Recording period	13.11.2006 - 19.11.2006					
Tariff	H1					
Tariff hours in compensation period	10					

Name of Co-ordination Centre or LFC block	Account before compensation (MWh)	Not yet delivered compensation (RAC) (MWh)	Compensation schedule (MW)	Account after compensation (MWh)
Co-ordination Centre South	-651.043	10.000	-66.000	-1.043
LFC block 7	252.047	-5.000	26.000	-2.953
LFC block 8	-791	-3.000	0	2.209
LFC block 9	104.910	5.000	10.000	-90
LFC block 10	49.898	3.000	5.000	-3.102
LFC block 11	-84.830	-4.000	-8.000	-830
LFC block 12	60.102	-3.000	6.000	3.102
LFC block DE	269.707	-3.000	27.000	2.707
Total	0	0	0	0

Co-ordination Centre North delta (MW)	0
Total of Co-ordination Centre North in tariff (MWh)	0

In this example there occur no rounding differences in the split of the Compensation Program of Unintentional Deviations for the LFC Blocks in the Co-ordination Centre North.

The table below shows the split of the Compensation Program of Unintentional Deviations between the LFC Area in LFC Block Germany.

Table 5: Example for compensation program of unintentional deviation (LFC block DE)

Recording period Tariff Tariff hours in compensation p	13.11.2006 - 19.11.2006 H1 10				
Name of LFC block or LFC area	Account before compensation (MWh)	Not yet delivered compensation (RAC) (MWh)	Compensation schedule (MW)	Account after compensation (MWh)	
LFC block DE	-269.707	3.000	-27.000	-2.707	
LFC area 1	-85.249	2.000	-9.000	2.751	
LFC area 2	-932.104	0	-93.000	-2.104	
LFC area 3	1.354.543	-1.000	136.000	-4.457	
LFC area 4	78.984	-1.000	8.000	-16	
LFC area 5	-146.467	-3.000	-14.000	-3.467	
Total	0	0	1,000	-10,000	

Total of LFC block DE in tariff (MWh)

Rounding to full MW

Rounding to full MW						
Recording period		13.11.2006 - 19.11.2006				
Tariff		H1				
Tariff hours in compensation	period	10				
Name of LFC block or LFC area	Account before compensation (MWh)	Not yet delivered compensation (RAC) (MWh)	Compensation schedule (MW)	Account after compensation (MWh)		
LFC block DE	-269.707	3.000	-27.000	-2.707		
LFC area 1	-85.249	2.000	-9.000	2.751		
LFC area 2	-932.104	0	-93.000	-2.104		
LFC area 3	1.354.543	-1.000	135.000	5.543		

LFC area 4	78.984	-1.000	8.000	-16
LFC area 5	-146.467	-3.000	-14.000	-3.467
Total	0	0	0	0
LFC block DE delta co	overed by LFC area 3 (N	IW)	-1.0	00
Total of LFC block DE in tariff covered by LFC area 3 (MWh)			-10.0	000

Like illustrated LFC Aras 3 as LFC Block responsible party for LFC Block Germany has to take over the rounding differences after calculation of Compensation Programs for the LFC Areas.

#### C-10-5 REGISTRATION FORM FOR ACCOUNTING PROCESS INCLUDING TIE-LINES

UCTE registrati	ion form t	for acc	ounting բ	orocess	including	g tie-lines

		_ J 1			9		
Requesting TSO A:			Requesting	TSO B:			
Responsible person:			Responsibl	e person	:		
Phone number :			Phone num	ber:			
Email:			Email:				
Responsible CA:			Responsibl	e CA:			
Responsible CB:			Responsibl	e CB:			
Responsible CC:		Responsible CC:					
<ul><li>New Tie line</li><li>Mutation of the existing Tie</li></ul>	line	<b>-</b>			<b>'</b>		
Requested implementation date:							ļ
Tie-line name and (if available) EIC T Code							
Tie-line topology:	o single t	ie-line	o T-ti	ie-line	o virtua	l tie-line	÷
Accounting point location:	o at TSO o at TSO o on the l	В	r (losses co	onsidere	d)		
Name of Cubatations	Substation 1			locate	ed at TSO		
Name of Substations:	If T- Tie-line						
	Substation 3 o 750 KV		o 110		ed at TSO		
Voltage level:	∘ 380 KV ∘ 220 KV		∘ 63 KV				
Resolution of data	o MWh		0	kWh			
Connection Type:	o AC		0	DC			
Time interval of time series resolution:	o 1/4h		0	1/2h		0	1h
<ul> <li>Changes in the accounting</li> </ul>	process						
Requested implementation date							
Unit of account of unintentional deviation:	o MWh		0	kWh			
Time resolution of account of unintentional deviation:	o 1/4h		0	1/2h		0	1h
Additional information:							
TSO A: Responsible person D	ate, Signature						
TSO B: Responsible person: D	ate, Signature						