Settlements and Billing

Configuration Guide: Transmission Loss Obligation Charge for Real Time Schedules Under Control Agreement

**CC 6976**

Version 5.2

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# Purpose of Document

The purpose of this document is to capture the requirements and design specification for a Settlements and Billing Pre-calculation in one document.

# Introduction

## Background

Energy schedules for some interties are subject to supplemental Transmission Loss charges associated with the use of the intertie’s transmission line and facilities based upon contractual obligations. The supplemental charges are determined for and applied to schedules of interties in accord with standing agreements between the CAISO and transmission line Operators.

The supplemental Transmission Loss quantities result in corresponding Transmission Loss obligation amounts being charged to Business Associates (BAs) whose schedules are associated with the losses. In addition to providing for the accurate Settlement of RT energy through an intertie, the loss quantities serve to provide for the adjustment of metered (or measured) demand quantities that are required for the allocation of a variety of charges and payments.

Based on supplemental loss quantity data that a transmission line scheduler provides to the California ISO (CAISO) per a transmission agreement, the CAISO administers the Settlement of supplemental losses for an intertie by applying supplemental loss charges to each intertie schedule that contributes to the supplemental losses. The supplemental loss quantities are charged in CC Transmission Loss Obligation Charge (CC 6976) and allocated in Allocation of Transmission Loss Obligation (CC 6977).

## Description

The Transmission Loss Obligation Charge (CC 6976) calculates Settlement Interval loss charges for Business Associates based on the supplemental losses allocation quantities calculated. The Allocation of Transmission Loss Obligation Charge (CC 6977) allocates these Settlement Interval loss charges based on an SC’s percentage of Control Area Measured Demand (excluding losses).

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
| 1.0 | TransmissionLossObligationChargeForSchedulesUnderControlAgreementAmount is calculated daily at a Settlement Interval granularity and can be either a charge or credit. |
| 2.0 | TransmissionLossObligationChargeForSchedulesUnderControlAgreementAmount is the product of the SettlementIntervalRealTimeLMP and the OpAgreementTransLossAllocationQuantity. |
| 2.1 | The Op\_Agreement\_Trans\_Loss\_Allocation\_Quantity is precalculated in a predecessor precalculation based on the relevant Transmission Operating Agreement with CAISO. |
| 3.0 | For adjustments to the Charge Code that cannot be accomplished by correction of upstream data inputs/recalculation or operator override Pass Through Bill Charge logic will be applied. |
| 4.0 | The formulas specific to COTP Losses exist to implement a contract between Pacific Gas & Electric (PG&E), Transmission Agency of Northern California (TANC) and Western Area Power Authority (WAPA) that governs the settlement of losses on the California-Oregon Transmission Project (COTP) transmission line. |
| 5.0 | Background to Western Hourly MEEA Price:  The Market Efficiency Enhancement Agreement (MEEA) is a contractual agreement between the CAISO and Western regarding where to Settle energy imported and exported by Western into and out of the CAISO during Peak and Off-Peak hours. And since Western is ensuring that the COTP Schedule are deemed delivered to the CAISO BAA while using Western Transmission, it is appropriate to consider the MEEA Price when settling COTP Losses.  Example: If 100 MW is injected in the NW and delivered to CAISO at TRCYCOTPISO, these schedules are using PGAE transmission ownership rights to get to CISO boundary. However, this transmission crosses Western territory and incurs losses, which Western backs by dispatching internal resources. This energy is what we are trying to financially compensate Western for. Because the Losses are backing schedules at TRCYCOTPISO, Settlements will consider the price at this location as one of the input. The secondary price being considered is the MEEA price because Western is providing energy to support these schedules and fall indirectly under the Market Efficiency Enhancement Agreement. |
|  | One of two prices will be applied to the Import and Export Gross Intertie Quantity.  Price 1 is the hourly DAM price of SP-TIE Location (Captain Jack – Tracy COTP ISO)  Price 2 is the hourly DAM MEEA Price which reflects On-Peak and Off Peak hours at SP-Tie location (MEEA – TRCYPGAE)  The COTP Price is  equal to the greater of (0, Price 1, Price2) |
| 5.0 | The loss payback quantity is the product of the gross intertie schedules in both the import and export directions, and COTP loss factor |
| 6.0 | The COTP Transmission Loss charges assessed here in CC 6976 are allocated out as a payment to WAPA in CC 6976 and as such will not result in an additional allocation amount later in CC 6977 |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Pre-calculation Real Time Price |
| Pre-calculation Allocation of Transmission Losses Under Control Agreements |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 6977 – Allocation of Transmission Loss Obligation Charge for Real Time Schedules under a Control Agreement |

## Inputs – External Systems

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Description |
| 1 | PTBChargeAdjustmentTransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementAmount BJmdhcif | PTB Charge Adjustment Transmission Loss Obligation Charge For RT Schedules Under Operating Agreement Amount by Business Associate ID B. |
| 3 | HourlyDANodalLMPPrice AA’Qpmdh | Day-Ahead LMP for Energy at nodal location. ($/MW) |
| 4 | CRRHourlyTOU dh | The CRR time of use for Trading Hour h. This definition is kept in the Master File with values 1 for ON (or On-Peak hours) or 0 for OFF (or Off-Peak hours). |
| 5 | SCCOTPLossFlag B | A flag input that, when = 1, identifies the one WAPA SCID that shall receive the financial loss payback |

## Inputs - Predecessor Charge Codes or Pre-calculations

|  |  |  |
| --- | --- | --- |
| Row # | Name | Predecessor Charge Code/  Pre-calc Configuration |
| 1 | SettlementIntervalRealTimeLMP BrtuM’mdhcif | Pre-calculation Real Time Price |
| 2 | Op\_Agreement\_Trans\_Loss\_Allocation\_Quantity BrtEuT’I’Q’M’PW’Nz’OVL’mdhcif | Pre-calculation Allocation of Transmission Losses under Operating Agreements |
| 3 | BAResourceImportandExportGrossIntertieScheduleQuantity BrtEAA’pQmdh | Pre-calculation Allocation of Transmission Losses under Operating Agreements (MWh) |

## CAISO Formula

TransmissionLossConsolidationAmount BrtEmdhcif = WAPACOTPLossPaymentAmount Bmdh + COTPLossPaybackAmount BrtEmdh +TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementAmount BrtEmdhcif

TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementAmount BrtEmdhcif = (-1) \* SettlementIntervalRealTimeLMP BrtuM’mdhcif \*Op\_Agreement\_Trans\_Loss\_Allocation\_Quantity BrtEuT’I’Q’M’PW’Nz’OVL’mdhcif

TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementQuantity

TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementQuantity BrtEmdhcif =  Op\_Agreement\_Trans\_Loss\_Allocation\_Quantity BrtEuT’I’Q’M’PW’Nz’OVL’mdhcif

TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementPrice

TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementPriceBrtmdhcif =  SettlementIntervalRealTimeLMP BrtuM’mdhcif

WAPA/TANC/PG&E – COTP Losses

WAPACOTPLossPaymentAmount Bmdh = (-1)\* CAISOCOTPLossPaybackAmount mdh \*SCCOTPLossFlag B

CAISOCOTPLossPaybackAmount mdh=sum(BrtE) COTPLossPaybackAmount BrtEmdh

COTPLossPaybackAmount BrtEmdh = sum(AA’pQ)

BAResourceImportandExportGrossIntertieScheduleQuantity BrtEAA’pQmdh \* HourlyCOTPLossPrice AA’Qpmdh

HourlyCOTPLossPrice mdh = Max(0, HourlyCOTPSchedulingPointTie1Price mdh, HourlyWesternMEEAPrice mdh)

HourlyCOTPSchedulingPointTie1Price mdh = Sum( AA’Qp) HourlyDANodalLMPPrice AA’Qpmdh

Where Q In (TRCYCOTPISO)

HourlyWesternMEEAPrice mdh =

If(CRRHourlyTOU dh =1, HourlyWesternMEEAOnPeakPrice mdh, If(CRRHourlyTOU dh =0, HourlyWesternMEEAOffPeakPrice mdh)

HourlyWesternMEEAOnPeakPrice mdh = Sum (AA’Qp)

If (CRRHourlyTOU dh =1, HourlyDANodalLMPPrice AA’Qpmdh,0)

Where (Q) = TRCYPGAE and (A) = WAPAMEEA3\_ON\_ASR-APND

HourlyWesternMEEAOffPeakPrice mdh = Sum (AA’Qp)

If (CRRHourlyTOU dh =0, HourlyDANodalLMPPrice AA’Qpmdh,0)

Where (Q) = TRCYPGAE and (A) = WAPAMEEA3\_OFF\_ASR-APND

The formulas below exist to facilitate deriving the quantities and prices in the Settlements hierarchy

TransmissionLossConsolidationQuantity BrtEmdhcif = TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementQuantity BrtEmdhcif + COTPLossPaybackQuantity BrtEmdh + WAPACOTPLossPaymentQuantity Bmdh

WAPACOTPLossPaymentQuantity Bmdh = (-1)\* CAISOWAPACOTPLossPaymentQuantity mdh \*SCCOTPLossFlag B

CAISOWAPACOTPLossPaymentQuantity mdh = sum(BrtE) COTPLossPaybackQuantity BrtEmdh

COTPLossPaybackQuantity BrtEmdh = sum(AA’Qp)

BAResourceImportandExportGrossIntertieScheduleQuantity BrtEAA’pQmdh

TransmissionLossConsolidationPrice BrtEmdhcif = (TransmissionLossConsolidationAmount BrtEmdhcif)/(TransmissionLossConsolidationQuantity BrtEmdhcif)

## Outputs

| Row # | Name | Description |
| --- | --- | --- |
| 1 | In addition to any outputs listed below, all inputs shall be included as outputs. | All inputs. |
| 2 | TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementQuantity BrtEmdhcif | Transmission Loss Obligation Charge For RT Schedules Under Operating Agreement Quantity by Business Associate ID B, Resource ID r. |
| 3 | TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementPrice Brtmdhcif | Transmission Loss Obligation Charge For RT Schedules Under Operating Agreement Price by Business Associate ID B, Resource ID r. |
| 4 | TransmissionLossObligationChargeForRTSchedulesUnderOperatingAgreementAmount BrtEmdhcif | Transmission Loss Obligation Charge For Real-Time Interchange Schedules in accordance with the Transmission Control Agreement Amount by Business Associate ID B, Resource ID r. |
|  | TransmissionLossConsolidationAmount BrtEmdhcif | Exists to roll up the three different derived amounts. Since the input WAPACOTPLossPaymentAmount Bmdh carries an SCID that is only ever used to derive the COTP Loss Payment Amount here in 6976 the fact that it carries a smaller attribute set than the other two inputs will not cause output matrix issues. |
|  | WAPACOTPLossPaymentAmount Bmdh | The one WAPA SCID that shall receive the financial loss payback is associated to the amount by use of the Flag |
|  | CAISOCOTPLossPaybackAmount mdh | This exists in order to facilitate paying the one WAPA SCID that shall receive the financial loss payback in a subsequent equation |
| 5 | COTPLossPaybackAmount BrtEmdh | The loss payback amount is the product of the gross intertie schedules and both the import and export direction, COTP loss factor, and COTP loss price  The ABS function on the quantity when its derived and the Max of 0 function on the Price when its derived will ensure that this amount is only ever a charge |
| 5 | HourlyCOTPLossPrice mdh | The COTP loss price is equal to the greater of 0, Hourly COTP Scheduling Point Tie 1 Price, Western MEEA price. |
| 6 | HourlyCOTPSchedulingPointTie1Price mdh | Where the Intertie ID is equal to ‘TRCYCOTPISO’ populate the hourly interval with HourlyDANodalLMPPrice AA’Qpmdh |
| 7 | HourlyWesternMEEAPrice mdh | Western MEEA price.    If the current hour is designated On-Peak then populate hourly interval with HourlyWesternMEEAOnPeakPrice mdh  Else  If the current hour is designated Off-Peak then populate hourly interval with HourlyWesternMEEAOffPeakPrice mdh |
| 7 | HourlyWesternMEEAOnPeakPrice mdh | If the current hour is designated On-Peak where Aggregate Price Node (A) = WAPAMEEA3\_ON\_ASR-APND then populate hourly interval with HourlyDANodalLMPPrice AA’Qpmdh. Else zero |
| 8 | HourlyWesternMEEAOffPeakPrice mdh | If the current hour is designated Off-Peak where Aggregate Price Node (A) = WAPAMEEA3\_OFF\_ASR-APND then populate hourly interval with HourlyDANodalLMPPrice AA’Qpmdh. Else zero |
| 9 | TransmissionLossConsolidationQuantity BrtEmdhcif | This exists solely to facilitate deriving the @CURRENT\_QUANTITY in the Settlements Hierarchy |
| 10 | WAPACOTPLossPaymentQuantity bmdh | This exists solely as a predecessor calculation and facilitates deriving the @CURRENT\_Quantity in the Settlements Hierarchy |
| 11 | CAISOWAPACOTPLossPaymentQuantity mdh | This exists solely as a predecessor calculation and facilitates deriving the @CURRENT\_Quantity in the Settlements Hierarchy |
| 12 | COTPLossPaybackQuantity BrtEmdh | This exists solely as a predecessor calculation and facilitates deriving the @CURRENT\_Quantity in the Settlements Hierarchy |
| 13 | TransmissionLossConsolidationPrice BrtEmdhcif | This exists solely to facilitate deriving the @CURRENT\_PRICE in the Settlements Hierarchy |

# Charge Code Effective Date

| Charge Code/  Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| Transmission Loss Obligation Charge for Real Time Schedules Under Control Agreement | 5.0 | 04/01/09 | 4/30/14 | Documentation Edits only |
| Transmission Loss Obligation Charge for Real Time Schedules Under Control Agreement | 5.1 | 05/01/14 | 3/31/2021 | Configuration Change |
| Transmission Loss Obligation Charge for Real Time Schedules Under Control Agreement | 5.2 | 4/1/2021 | Open | Configuration Change |