



CALIFORNIA ISO

Charge Type 4503
Core Reliability Services
Export Energy

Updated
June 23, 2005

1.1. **Version 0.2: CT 4503 GMC Core Reliability Services Export Energy**

1.1.1. **Description**

Core Reliability Services are the basic services needed to manage the Control Area reliably and safely. The billing determinant for this function should be reflective of the costs of maintaining the operational control at all times of the day and seasons of the year, as well the stress that entities place on the transmission system. The billing determinant selected is the sum of gross Export Real Time Flow plus transmission losses for applicable system resources for a Scheduling Coordinator for all Settlement Intervals in a trade month. Export RT Flow is calculated as the sum of all the Deemed RT Scheduled Energy Quantity plus transmission losses for specific system resources. The sign convention for the Deemed RT Scheduled Energy Quantity, positive values are used to distinguish an export from an Import for System Resources (where negative values designate an Import) and only positive quantities are used as exports. Export quantities for OOM and Supplemental Energy are also included. An entity's exports from the grid reflect the burden that the entity places on the operation of the transmission system. Core Reliability Services must be provided at all times of the day.

1.1.2. **Configuration History**

The following table sets out changes in the configuration of this charge type from when it was first created until it is retired.

Version number is expressed as a sequentially increasing number for each configuration change. A new version is established for each production release after successful testing and is shown as an integer increase (0.1, 0.2, 0.3). Changes under development will be indicated by an incremental version number (that is, 1.1, 1.2, 1.3) until the production release.

The Effective Start and End dates reflect the actual trades for which the configuration applies. Update Date is the actual calendar date of configuration guide edits.

Version #	Effective Start	Effective End	Author	Update Date	Description of Changes
0.1	Stage 1	Stage 2	M. McGuffin & E. Siegel	5/30/04	Original version
0.2	Stage 1	Stage 2	E. Siegel	1/30/05	Assigned a Charge Type number. MID4 received a BAID in 01/2005 and needed to be added to exemption table.

1.1.3. **Calculation Formula**

The ISO formula for the **Monthly Core Reliability Services - Exports** for each **Scheduling Coordinator** is as follows:

GMC Core Reliability Services - Exports Settlement Amount $_{sm}$ = ***Monthly GMC Core Reliability Services Export Quantity*** $_{sm}$ * ***GMC Core Reliability Services Export Rate*** $_m$

Where

GMC Core Reliability Services Export Rate m

is the current FERC approved rate for the CAISO Control Area

And

Monthly GMC Core Reliability Services Export Quantity $smd = \sum_{rQ} \sum_Z \sum_h \sum_E$ (Deemed

Delivered Real time Scheduled Energy $srQtZEmdh$

Where

Deemed Delivered Real time Scheduled Energy $srQtZEmdh > 0$

And

Location type (t) = System Resource

And

Core Reliability Services- Export Exception $srQ \neq True$

Where

s = Business Associate

r = Location ID

t = Location Type

Z = Zone

Q = Interchange Index

m = Month

d = Trade day

h = Trade Hour

i = Settlement Interval

E = Energy Type

Equation Name	Description
GMC Core Reliability Services - Exports Settlement Amount	The total amount charged to a Scheduling Coordinator for Core Reliability Services - Exports in a Trade Month (hourly values are output daily)
Monthly GMC Core Reliability Services - Exports Quantity	The total Core Reliability Services - Exports quantity for a Scheduling Coordinator in a Trade Month (hourly values are output daily).
GMC Core Reliability Services - Exports Rate	The current FERC approved rate for Core Reliability Services - Exports.
Core Reliability Services - Exports Exception	Flag indicating any exceptions to the GMC Core Reliability Services - Exports calculation
Deemed Delivered Real Time Scheduled Energy Quantity	The total gross Exports for a System Resource for a Settlement Interval. The gross Export quantity provided to Settlements represents the sum of gross HA Export Schedules plus Real Time Export Schedule adjustments. In the CRSE calculation, Deemed RT Scheduled Energy Quantity is the Hourly sum of all positive quantities for System Resources for a Scheduling Coordinator in a Dispatch Interval.

1.1.4. Calculation Exceptions

The following Scheduling Coordinators, Locations (and Interchanges where appropriate) require special treatment with regard to the CRS Exports calculation. Exceptions can be defined as exemptions, or require the use of certain Location IDs as opposed to others.

BA I D #	Scheduling Coordinator Name (Short Name)	Location ID	Interchange ID (if applicable)	Exception / Treatment	Quantity	Variable Name	Effective Start Date	Effectiv e End Date	Comments
1014/ 1268	SCE1, SCE2	ELDORD_5 _MCLLGH	WALC_CA_011, SRP_CA_001, SCE_LDWP_111	Exclude all exports from Core Reliability Services – Exports Calculations	Export	Configuration Specialist?	1/1/04	Open	LADWP schedules Submitted by SCE
1014/ 1268	SCE1, SCE2	MALIN_5_R NDMTN	LDWP_CA_0023, LDWP_CA_0024	Exclude all exports from Core Reliability Services – Exports Calculations	Export	Configuration Specialist?	1/1/04	Open	LADWP schedules Submitted by SCE
1014/ 1268	SCE1, SCE2	SYLMAR_2_ LDWP	LDWP_CA_0023, LDWP_CA_0024, LDWP_CA_0028, LDWP_CA_0029, LDWP_PVD_0033, LDWP_PVD_034, LDWP_PVD_033	Exclude all exports from Core Reliability Services – Exports Calculations	Export	Configuration Specialist?	1/1/04	Open	LADWP schedules Submitted by SCE
1014/ 1268	SCE1, SCE2	PVERDE_5_ DEVERS	LDWP_PVD_0033, LDWP_PVD_034, LDWP_PVD_033	Exclude all exports from Core Reliability Services – Exports Calculations	Export	Configuration Specialist?	1/1/04	Open	LADWP schedules Submitted by SCE
1014/ 1268	SCE1, SCE2	MEAD_2_W ALC	SRP_CA_011 WALC_CA_006 WALC_CA_011	Exclude all exports from Core Reliability Services – Exports	Export	Configuration Specialist?	1/1/04	Open	LADWP schedules Submitted by SCE

BA I D #	Scheduling Coordinator Name (Short Name)	Location ID	Interchange ID (if applicable)	Exception / Treatment	Quantity	Variable Name	Effective Start Date	Effectiv e End Date	Comments
				Calculations					
1268/ 1014	SCE1, SCE2	LUGO_5_VIC TVL	SCE_LDWP_111	Exclude all exports from Core Reliability Services – Exports Calculations	Export	<i>Configuration Specialist?</i>	1/1/04	Open	
1014/ 1268	SCE1, SCE2	MEAD_2_ WALC	SCE_NEVP_111 SCE_SRP_111	Exclude all exports from Core Reliability Services – Exports Calculations	Export	<i>Configuration Specialist?</i>	1/1/04	Open	Schedules Submitted by SCE for Mohave Share participants (SRP and NEVP) LADWP Mohave share already taken into account above
3933	PGAE & COTB (COTB)	All	All	Exclude all Export quantities from Core Reliability Services - Exports calculation; Use Core Reliability Services - Exports exception by SC and Resource, and Core Reliability Services - Exports exception by SC and	Deemed RT Scheduled Energy Quantity for Exports	<i>Configuration Specialist?</i>	4/6/2001	Open	

BA ID #	Scheduling Coordinator Name (Short Name)	Location ID	Interchange ID (if applicable)	Exception / Treatment	Quantity	Variable Name	Effective Start Date	Effective End Date	Comments
				System Resource/Interchange combination					
2970	Internal ISO ID used in Energy Exchange Transactions	All	All	Exclude ISO SC from All GMC charges	All	Configuration Specialist?	4/6/2001	Open	
5819	MID4	All	All	Exempt from CRS Export Energy	All	Configuration Specialist	1/1/2004	Open	Charge for MID4 handled in a separate charge type.

1.1.5. Calculation Bill Determinants

Input Name	Type	Interval	Sign	Description	Source	Variable Name	Alias	Rounding	Actual Attributes	Derived Attributes
Deemed Delivered Real Time Scheduled Energy Quantity <i>Where Location Type = "C"</i>	I	H	+/-	The total RT flows for Exports for System Resources in a dispatch interval, summed to an hourly quantity. Both positive and negative values will be transferred to the Settlements System, however only positive quantities indicate an Export, and only Export quantities are used in the calculation	STLMTS – System Resource Energy Pre-Calc	Configuration Specialist	Configuration Specialist	9	Trade Date, Trade Hour, Settlement Interval, Dispatch Interval, BA ID, Location ID, Interchange ID, Location Type, Energy Type, Zone ID	

In reviewing this table:

- Type indicates whether the Bill determinant is provided by an external system (S) or calculated as an intermediate value by another process (I).

- Interval is the interval of the incoming record
- Source for the moment is the expected supplying system. This will be replaced with actual system names in the “as built” version of the configuration guide.
- Actual attributes are parameters used in the calculation that are expected to be supplied with the source data.

Specific Master File data used by this charge type is as follows:

Master file Data	Description	Type	Variable Name	Detail	Actual Attributes	Derived Attributes
Location	Valid Location	Primary record	<i>Configuration Specialist</i>		BA_ID Location ID, Location Type	
BA	Valid Business Associate	Primary record	<i>Configuration Specialist</i>		BA_ID	

In reviewing this table:

- Type indicates whether the Master file is one of the following:
 1. A primary record (such as SC, or resource)
 2. An association (which is a connection between any two primary records, such as ownership)
 3. An attribute (such as a flag or equivalent specific to a primary record that can be used for billing, for example resource type)
 4. A roll up group where a primary record is within a further hierarchy (such as region, zone etc, noting that locations, etc are primary records in their own right)
- Details are the actual flag or association.

These are summarized in total for settlements in Volume 3, Interface Configuration

Specific Standing data used by this calculation are as follows:

Input Name	Type	Interval	Unit of Measure	Description	Source	Variable Name	Alias	Rounding	Actual Attributes	Derived Attributes
GMC Core Reliability Services - Exports Rate	T	Annual	\$/MWh	Monthly rate for Core Reliability Services - Exports based on forecasted Hourly MW values	STLMTS			9	Rate, Effective Start Date, Effective End Date	
Core Reliability Services - Exports Exception by BA	EF	Periodic	NA	True or False – Exception Quantity by BA	STLMTS			NA	BA_ID, Effective Start Date, Effective End Date	
Core Reliability Services - Exports Exception by BA / Location Interchange	EF	Periodic	NA	True or False – Exception Quantity by BA / Location / Interchange	STLMTS			NA	BA_ID, Location ID, Interchange ID, Effective Start Date, Effective End Date	

In reviewing this table:

- Type indicates whether the Bill determinant is standing data for a Tariff Rate (T), a rate calculated as an intermediate value by another process (CR), or a Exception Flag (EF).
- Interval indicates the frequency with which the input is updated.
- Source for the moment is the expected supplying system. This will be replaced with actual system names in the “as built” version of the configuration guide.

1.1.6. Calculation Attributes

Billable quantity and summary levels must be indicated as attributes. All quantity and pricing inputs must satisfy these attributes for bill determinants to be calculated.

Attribute Name	Order	USE	Sum	Key Value	Notes
Market Type		Y			Standard attribute, use TBD
Major group		Y			Standard attribute, use TBD
Charge Group		Y			Standard attribute, use TBD
Trade Date		Y			
Trade Hour		Y	Y		Sum to Hourly
Settlement Interval		Y			
BA ID		Y	Y		Used to sum by customer
Location ID		Y			
Interchange ID		Y			
Location Type		Y			
Energy Type		Y			All Energy Types included
Zone		Y			

Calculation Details	Value	Notes
Calculation Frequency	Daily	
Number of Intervals	25	For each SC
Prerequisite Calculation	System Resource Energy quantity Pre-Calculation	
Successor Charge Types	GMC Energy And Transmission Services Energy calculation	

1.1.7. Calculation Flowchart

The high-level calculation flowchart for the Core Reliability Services – Exports is shown below. The flowchart will have ?? levels:

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1.1.8. Output Requirements and Definitions

Output requirements include details of which charge type outputs are to be reported to participants in the detailed Quantity, Price, and Charge detail format. The specific participant outputs are defined, together with any intermediate outputs needed to validate charges prior to publishing results, or used as inputs in other charge calculations

1.1.9.

Output type	Level	Expected quantities	Unique Output	Rounding	Output	Variable Name
Detailed BQ out and Bill Determinant	Hourly Core Reliability Services - Exports Quantity by SC	# of SCs * 25	Yes	9		
Detailed BQ output	GMC Core Reliability Services - Exports Rate	1	Yes	9		
Detailed BQ output	Hourly GMC Core Reliability Services - Exports Settlement Amount	# of SCs * 25	Yes	9		
Daily settlement statement	GMC Core Reliability Services - Exports Settlement Amount	# of SCs	Yes	9		
Invoice	SC by bill period	# of SCs	Yes	9		

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1.1.9.1. Adjustments

Automatic adjustments to this charge type will occur in the event of revised data input from source data, recalculations to a required Pre-calculation, or a revised GMC Core Reliability Services - Exports rate, by performing a recalculation against the prior run.

1.1.9.2. Rounding Adjustments

As this product type is a charge calculation only, no rounding adjustment is required.

1.1.10. Validation and Testing

1.1.10.1. Validation

This calculation is validated in the Pre-Settlement Validation Run. The table below sets out the validation checks that must occur:

Validation	Timing	Description	Applicable to
Exceptions are accurately reflected.	During	Calculation error produced when this condition is not met.	Initial and recalculation run types
GMC Core Reliability Services - Exports Settlement Amount >=0	After	Calculation error if this condition is not met. Initial settlement of GMC Core Reliability Services - Exports must be a positive value (that is, a charge to Scheduling Coordinators).	Initial run types

Validation	Timing	Description	Applicable to
Sign convention for GMC Core Reliability Services - Exports Settlement Amount	After	Calculation error. Incremental runs of GMC Energy and Transmission Net Energy must maintain the proper sign convention for the Settlement amount if Core Reliability Services - Exports rate updates impact the direction of the charge. Payments to SCs must be negative settlement amounts, and additional charges to SCs must be positive settlement amounts	Recalculation run types
Deemed RT Scheduled Energy Quantity by System Resource > 0	During	Calculation error if condition is true. Only Export quantities are used in the Core Reliability Services - Exports calculation, which are represented as a positive value.	Initial and recalculation run types
Control Area Totals >= 0	After	Calculation Error if any of the Control Area summations are zero or negative.	Initial and recalculation run types

1.1.10.2. Testing

The following conditions must be tested prior to release of any configuration to production:

Calculation Specific Testing:

Detail standard tests that need to be conducted for this calculation:

Test Condition	Description	Applicable to
Exceptions are accurately reflected	All exceptions listed must be incorporated into the calculation correctly.	Initial and recalculation run types
Sign Convention	The sign conventions on input data assumed as part of this configuration are correct. In other words Deemed RT Scheduled Energy Quantities are positive.	Initial and recalculation run types

Successor Calculation or Charge Type Specific Tests

Test Condition	Description	Applicable to
Core Reliability Services - Exports exemptions are correctly applied	All exemptions are excluded correctly from subsequent calculations	Core Reliability Services - Exports
Core Reliability Services - Exports exemptions effective dates handles correctly	Exceptions past their termination date and prior to the effective start date are ignored	Core Reliability Services - Exports

Revision Table

Date	Description
March 18, 2005	Original
June 23, 2005	Adjusted sign convention for exports in section 1.1.3