

NPRR320 – Printable Version

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NPRR Number	320	NPRR Title	Minimum PTP Option Bid and Settlement (formerly “Minimum PTP Option Bids and CRR Auction Fees”)
Revision Description		This Nodal Protocol Revision Request (NPRR) sets a minimum price on PTP Option bids (Minimum PTP Option Bid Price) of \$0.010 and places a fee on each PTP Option bid awarded where the clearing price for the PTP Option bid awarded is less than the Minimum PTP Option Bid Price. Upon implementation of system changes, the revenue from the fees will be put in the Congestion Revenue Right (CRR) Balancing Account. Until system changes are implemented, the PTP Option Bidding Fee will be invoiced separately from CRR Invoices using a Miscellaneous Invoice, and the revenue from the fees will be distributed by the monthly Load Ratio Share (LRS) and through the use of a Miscellaneous Invoice.	

Proposed Protocol Language Revision

2.1 DEFINITIONS

~~Congestion Revenue Right (CRR) Bid/Offer Fee~~

~~An ERCOT Board approved fee placed on bids and offers in the CRR Auction~~

Minimum Point-to-Point (PTP) Option Bid Price

A value of \$0.010 representing the minimum price that can be submitted into the CRR Auction for a PTP Option bid.

Point-to-Point (PTP) Option Award Fee

A fee placed on each PTP Option bid awarded where the clearing price for the PTP Option bid awarded is less than the Minimum PTP Option Bid Price as further described in Section 7.7.1, Charging of PTP Option Award Fee.

7.5.2 CRR Auction Offers and Bids

- (1) To submit bids or offers into a CRR Auction, an Entity must become a CRR Account Holder and satisfy financial assurance criteria required to participate, under Section 16.8, Registration and Qualification of Congestion Revenue Rights Account Holders.

NPRR320 – Printable Version

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- ~~(2) No later than six months prior to the Texas Nodal Market Implementation Date, ERCOT shall report to the Technical Advisory Committee (TAC) about whether a limit on bid volume or a nominal transaction charge for each bid submitted would benefit the auction process. Recommendations from TAC must be approved by the ERCOT Board and may be implemented without further revision to these Protocols.~~
- (23) In order to enforce a volume limitation on the number of market transactions (bids and offers) submitted into the CRR Auction, ERCOT shall evaluate the maximum number transactions which are available prior to the auction, and evenly divide the limit across the CRR Account Holders. This limit shall be designated as the allocated CRR transaction limit. The allocated CRR transaction limitation for all CRR Account Holders will be communicated as part of the CRR Auction Notice prior to each auction.
- (a) No CRR Account Holder shall submit more than 10,000 transactions in any CRR Auction.
 - (b) If the total number of transactions submitted by all Market Participants into the CRR Auction does not exceed the maximum number of transactions available prior to the auction, then the allocated CRR transaction limit will not apply and all transactions will be accepted.
 - (c) If the total number of transactions submitted by CRR Account Holders exceeds the maximum number of transactions available prior to the auction, ERCOT shall notify all CRR Account Holders within one hour of the close of each CRR Auction that the maximum number of transactions has been exceeded. Each CRR Account Holder shall then adjust their transactions to be less than or equal to the allocated CRR transaction limitation for the affected CRR Auction within one Business Day. If the Market Participant fails to reduce its transactions to the allocated CRR transaction limitation within one Business Day, ERCOT shall reject all transactions submitted by that CRR Account Holder into the affected CRR Auction. ERCOT will then execute the CRR Auction using the updated set of transactions as revised by Market Participants.
 - (d) Each Counter-Party is limited to a total of three CRR Account Holders.
 - (e) ERCOT shall charge a fee on each PTP Option bid awarded in each CRR Auction as described in Section 7.7, Point-to-Point (PTP) Option Award Fee.

7.5.2.3 CRR Auction Bid Criteria

- (1) A CRR Auction Bid indicates a willingness to buy CRRs at the auction clearing price, if it is equal to or less than the Not-to-Exceed Price. It must be submitted by a CRR Account Holder and must include the following:

NPRR320 – Printable Version

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- (a) The name of the CRR Account Holder;
 - (b) The single type of CRR being bid;
 - (c) The source Settlement Point and the sink Settlement Point or name of flowgate for the block of CRRs being bid;
 - (d) The month for which the block of CRRs is being bid, including block designation;
 - (e) The quantity of CRRs in MW, which must be the same for each hour within the block, for which the Not-to-Exceed Price is effective; and
 - (f) A dollars per CRR (i.e. dollars per MW per hour) for the Not-to-Exceed Price.
- (2) The CRR Account Holder may submit a self-imposed auction-wide credit limit, if desired.
- (3) A bid to buy a PTP Option or ~~Flowgate Right~~FGR cannot specify a ~~negative~~ Not-to-Exceed Price less than the Minimum PTP Option Bid Price.
- (4) A bid to buy a PTP Obligation can specify a negative Not-to-Exceed Price.
- (5) A bid to buy an FGR must specify the name of a flowgate defined in Section 7.3.1, Flowgates.
- (65) A CRR bid for a specified MW quantity of CRRs constitutes a bid to buy a quantity of CRRs equal to or less than the specified quantity. A CRR bid may not specify a minimum quantity of MW that the CRR Account Holder wishes to buy.

7.5.5.3 Auction Process

- (1) The auction must be a single-round, simultaneous auction for selling the CRRs available for all auction products, with the following steps:
- (a) ERCOT shall enter into the CRR Auction engine model a credit constraint for each Counter-Party. ~~A Counter-Party's CRR Auction credit limit is equal to the lesser of the credit limit as determined in Section 16.11.4.6.1, Credit Requirements for CRR Auction Participation, or, if provided, the Counter-Party's self-imposed CRR Auction credit limit.~~ A Counter-Party's CRR Auction credit limit is equal to the lesser of the credit limit as determined in Section 16.11.4.6.1, Credit Requirements for CRR Auction Participation, or, if provided, the Counter-Party's self-imposed CRR Auction credit limit. The credit constraint for each Counter-Party ensures that the following sum for all of the Counter-Party's CRR Account Holders is less than or equal to the Counter-Party's CRR Auction credit limit:

NPRR320 – Printable Version

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- (i) All awarded CRR Auction Bids multiplied by the absolute value of the corresponding bid price; plus
 - (ii) All awarded CRR Auction Offers with negative offer prices multiplied by the absolute value of their corresponding offer price; plus
 - (iii) The additional credit requirement for all awarded PTP Obligations, which is \$A per MW per hour, plus the absolute value of the PTP Obligation bid price multiplied by M. The values of A and M Shall be posted on the MIS Public Area. TAC shall review these values at least annually and may recommend, to the ERCOT Board, changes to these values that become effective at least 30 days prior to a monthly CRR Auction and 60 days prior to an annual CRR Auction. Any changes to these values shall be posted on the MIS Public Area within three Business Days of ERCOT Board approval.
- (b) ERCOT shall award CRRs in quantities truncated to the nearest tenth MW (0.1 MW).
- (c) The CRR clearing price is equal to the corresponding Shadow Price for that CRR product.
- (d) When a CRR Account Holder is awarded CRRs as a result of a CRR Auction, the CRRs do not become the property of the winning CRR Account Holder, and the CRRs may not be placed in their CRR accounts, until the CRR Invoices have been paid in full.
- (e) When a CRR Account Holder sells PTP Obligations as a result of an auction at a negative price, the CRR Account Holder is not relieved of the PTP Obligations until the CRR Invoices have been paid in full.
- (2) ERCOT shall use a linear programming auction engine model for each CRR Auction that evaluates all CRR Auction Bids and CRR Auction Offers submitted, and selects a combination of CRR Auction Bids and CRR Auction Offers that:
- (a) Makes the solution simultaneously feasible within the limits of the ERCOT network capability over the auction term; and
 - (b) Maximizes the objective function, which is equal to the total economic value (as expressed in the CRR Auction Bids) of the awarded CRR Auction Bids, less the total economic cost (as expressed in CRR Auction Offers) of the awarded CRR Auction Offers, while observing all applicable constraints.
- (3) The CRR Network Model must, to the extent practicable, reflect the continuous and post-contingency system operating limits and operational procedures (i.e., Special Protection

NPRR320 – Printable Version

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Systems and Remedial Action Plans) in the Network Operations Model used by ERCOT during Real-Time Operations, as discussed below in Section 7.5.5.4, Simultaneous Feasibility Test.

- (4) Once a CRR Auction is complete, ERCOT shall archive and keep the CRR Auction system and all models used to finalize the CRR Auction results under ERCOT's data retention policy as that policy applies to data that may be needed to resolve requests for billing adjustments under applicable billing adjustment procedures.

7.5.7 Method for Distributing CRR Auction Revenues

- (1) ERCOT shall determine, for each month, the CRR Monthly Revenues (CMR). The CMR is the sum of:
 - (a) Monthly CRR revenue for that month; and
 - (b) PCRR revenues.
- (2) ~~For the first three years after the TNT Market Implementation Date~~Prior to December 1, 2013, ERCOT shall credit the net CRR Auction revenue (including PCRR revenue) produced from CRRs cleared in each CRR Auction that source from a Settlement Point located within a 2003 ERCOT Congestion Management Zone (CMZ) and sink at a Settlement Point located within the same 2003 ERCOT CMZ to QSEs in the 2003 ERCOT CMZ on a zonal Load Ratio Share basis. All other net CRR Auction revenues must be allocated to QSEs on an ERCOT-wide Load Ratio Share basis. For these allocation purposes, any NOIE Load Zone is considered to be located entirely within the 2003 ERCOT CMZ that represented the largest Load for that NOIE or group of NOIEs in 2003. Before the end of the three-year period described above, the ERCOT Board shall consider whether to extend the policy or ratify some other alternative.
- (3) For Initial distribution of CRR Monthly Revenues, revenues shall be paid to each QSE based on that QSE's Load Ratio Share in the interval coincident with the ERCOT-wide peak 15-minute Settlement Interval for the month.
- (4) ERCOT shall true up the distribution of CRR Monthly Revenues based on that QSE's Load Ratio Share in the interval coincident with the ERCOT-wide peak 15-minute Settlement Interval for the month.
- (5) The net CRR Auction Revenue produced from CRRs cleared and paid for in each CRR Auction that source from a Settlement Point within a 2003 ERCOT CMZ and sink at a Settlement Point located within the same 2003 ERCOT CMZ shall be distributed on a zonal Load Ratio Share basis. The portion of the net monthly CRR Auction Revenue to be distributed to each QSE with load in that zone for a given month is calculated as follows:

NPRR320 – Printable Version

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$$\text{LACMRZAMT}_{z,q} = (-1) * \sum_a (\text{CRRZREV}_{z,a} + \text{PCRRZREV}_{z,a}) * \text{MLRSZ}_{z,q}$$

The above variables are defined as follows:

Variable	Unit	Definition
LACMRZAMT _{z,q}	\$	<i>Load-Allocated CRR Monthly Revenue Zonal Amount per zone per QSE</i> —The payment to QSE <i>q</i> of the revenues resulted from the CRRs that source and sink in CMZ <i>z</i> , for the month.
CRRZREV _{z,a}	\$	<i>CRR Zonal Revenue per zone per CRR Auction</i> —The revenue resulted from the CRRs that source and sink in CMZ <i>z</i> , cleared through CRR Auction Offers and CRR Auction Bids in CRR Auction <i>a</i> , for the month.
PCRRZREV _{z,a}	\$	<i>PCRR Zonal Revenue per zone per CRR Auction</i> —The revenue resulted from the PCRRs that source and sink in CMZ <i>z</i> , pertaining to CRR Auction <i>a</i> , for the month.
MLRSZ _{q,z}	none	<i>Monthly Load Ratio Share Zonal per QSE per zone</i> —The LRS of QSE <i>q</i> for its Load in CMZ <i>z</i> , for the peak-Load 15-minute Settlement Interval in the month.
<i>q</i>	none	A QSE.
<i>z</i>	none	A 2003 ERCOT CMZ.
<i>a</i>	none	A CRR Auction.

- (6) The net CRR Auction Revenue produced from CRRs cleared and paid for in each CRR Auction that do not source from a Settlement Point within a 2003 ERCOT CMZ and sink at a Settlement Point located within the same 2003 ERCOT CMZ shall be distributed on an ERCOT-wide LRS basis. The portion of the net monthly CRR Auction Revenue Amount (from CRRs with paths that cross the 2003 ERCOT CMZ boundaries) to be distributed for a given month is calculated as follows:

$$\text{LACMRNZAMT}_q = (-1) * \sum_a (\text{CRRNZREV}_a + \text{PCRRNZREV}_a) * \text{MLRS}_q$$

The above variables are defined as follows:

Variable	Unit	Definition
LACMRNZAMT _q	\$	<i>Load-Allocated CRR Monthly Revenue Non-Zonal Amount per QSE</i> —The payment to QSE <i>q</i> of the revenues resulted from the CRRs that source and sink in different CMZs, for the month.
CRRNZREV _a	\$	<i>CRR Zonal Revenue per CRR Auction</i> —The revenue resulted from the CRRs that source and sink in different CMZs, cleared through CRR Auction Offers and CRR Auction Bids in CRR Auction <i>a</i> , for the month.
PCRRNZREV _a	\$	<i>PCRR Zonal Revenue per CRR Auction</i> —The revenue resulted from the PCRRs that source and sink in different CMZs, pertaining to CRR Auction <i>a</i> , for the month.
MLRS _q	none	<i>Monthly Load Ratio Share per QSE</i> —The LRS calculated for QSE <i>q</i> for the peak-Load 15-minute Settlement Interval in the month. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval.
<i>q</i>	none	A QSE.

NPRR320 – Printable Version

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a	none	A CRR Auction.
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7.6 CRR Balancing Account

- (1) In the Day-Ahead Market (DAM), if the Congestion Rent is equal to or greater than the net amounts due to all Congestion Revenue Right (CRR) Owners for any Settlement Interval, then ERCOT shall pay the net amounts due to the CRR Owners and put any excess amount into the CRR Balancing Account.
- (2) In the DAM, if the Congestion Rent is less than the net amounts due to all CRR Owners for any Settlement Interval, then ERCOT shall short-pay each CRR Owner on a prorated basis and shall keep track of how much each CRR Owner has been short-paid. The proration must be calculated using only the amounts due to the CRR Owner for CRRs settled in both the DAM and Real-Time and not using amounts due to ERCOT for Point-to-Point (PTP) Obligations owned by the CRR Owner.
- (33) ERCOT shall pay any positive balance in the CRR Balancing Account to each short-paid CRR Owner, with the amount paid to each CRR Owner being the lesser of (a) a prorated amount based on the short-paid amount for that CRR Owner compared to the total short-paid amount, and (b) the short-paid amount for that CRR Owner. Any remaining positive balance in the CRR Balancing Account must be allocated to all QSEs on the QSE's Load Ratio Share in the interval coincident with the ERCOT-wide peak 15-minute Settlement Interval for the month.

7.7 ~~[RESERVED]~~ Point-to-Point (PTP) Option Award Fee

7.7.1 Charging of PTP Option Award Fee

- (1) ERCOT will charge each CRR Account Holder a PTP Option Award Fee for each PTP Option bid awarded where the clearing price for the PTP Option bid awarded is less than the Minimum PTP Option Bid Price.
- (2) TAC and the ERCOT Board shall review the current Minimum PTP Option Bid Price at least every January and may recommend to the ERCOT Board changes to these values by submitting a Nodal Protocol Revision Request (NPRR).
- (3) ERCOT shall charge each CRR Account Holder for its PTP Option bids awarded in each CRR Auction as follows:

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NPRR320 – Printable Version

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$$\text{OPTAFAMT}_{crrh, a} = \frac{\sum_{bp} \sum_h \sum_{(j,k)} (\text{Max } (0, \text{OPTMBP} - \text{OPTPR}_{(j, k), a, h, bp}) * \text{OPTP}_{crrh, (j, k), a, h, bp})}{\text{OPTP}_{crrh, (j, k), a, h, bp}}$$

The above variables are defined as follows:

Variable	Unit	Definition
<u>OPTAFAMT_{crrh, a}</u>	<u>\$</u>	<u>PTP Option Award Fee Amount per CRR Account Holder per CRR Auction—The fee assessed to CRR Account Holder crrh for PTP Option awards awarded in CRR Auction a, for the hour for which the clearing price is less than the defined Minimum PTP Option Bid Price. For a multi-month CRR Auction, the fee shall be calculated for each month.</u>
<u>OPTMBP</u>	<u>\$/MW per hour</u>	<u>Minimum PTP Option Bid Price—As defined in Section 2.1, Definitions.</u>
<u>OPTPR_{(j, k), a, h, bp}</u>	<u>\$/MW per hour</u>	<u>PTP Option Price per source and sink pair per CRR Auction—The clearing price of a PTP Option with the source j and the sink k in CRR Auction a, for the hour h, for the bid period bp.</u>
<u>OPTP_{crrh, (j, k), a, h, bp}</u>	<u>MW</u>	<u>PTP Option Purchase per CRR Account Holder per source and sink pair per CRR Auction—The MW quantity that represents the total of CRR Account Holder crrh's PTP Option bids associated with the source j and the sink k awarded in CRR Auction a, for the hour h, for the bid period bp.</u>
<u>crrh</u>	<u>None</u>	<u>A CRR Account Holder.</u>
<u>j</u>	<u>None</u>	<u>A source Settlement Point.</u>
<u>k</u>	<u>None</u>	<u>A sink Settlement Point.</u>
<u>a</u>	<u>None</u>	<u>A CRR Auction.</u>
<u>h</u>	<u>None</u>	<u>An Operating Hour.</u>
<u>bp</u>	<u>None</u>	<u>A CRR bid period.</u>

7.7.2 Disbursement of PTP Option Award Fee

- (1) ERCOT shall distribute the sum of the fees collected for CRR Auction fees (as described in Section 7.7, Point-to-Point (PTP) Option Bid and Award Fees) on an ERCOT-wide monthly Load Ratio Share (LRS) basis. The payment to Qualified Scheduling Entities (QSEs) for a given month shall be calculated as follows:

$$\text{CRRFEEAMT}_a = (-1) * \text{CRRFEETOT} * \text{MLRS}_a$$

Where:

NPRR320 – Printable Version

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$$\text{CRRFEETOT} = \sum_{\text{crrh}} \sum_a (\text{OPTAFAMT}_{\text{crrh},a})$$

The above variables are defined as follows:

Variable	Unit	Definition
CRRFEEAMT_q	\$	<u>Load-Allocated CRR Fee Amount per QSE</u> —The payment to QSE q of the revenues resulted from the PTP Option Award Fees, for the month.
MLRS_q	none	<u>Monthly Load Ratio Share per QSE</u> —The LRS calculated for QSE q for the peak-Load 15-minute Settlement Interval in the month. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval.
CRRFEETOT	\$	<u>CRR Auction Fee Total</u> —The sum of the PTP Option Award Fees charged to all CRR Account Holder in single-month or multi-month CRR Auctions for the month
$\text{OPTAFAMT}_{\text{crrh},a}$	\$	<u>PTP Option Award Fee Amount per CRR Account Holder per CRR Auction</u> —The PTP Option Award Fee assessed to CRR Account Holder crrh for PTP Option awards awarded in CRR Auction a , for the hour for which the clearing price is less than the defined Minimum PTP Option Bid Price for the month. For a multi-month CRR Auction, the fee shall be calculated for each month.
q	none	A QSE.
crrh	none	CRR Account Holder.
a	none	A CRR Auction.

- (2) CRR Auction fees collected for a given month, from a monthly auction or a multi-month auction, shall be distributed ten days after the final settlement of the last Operating Day of that month has been posted, as described in item (1) of Section 9.5.5, RTM Final Statement. If the tenth day is not a Business Day or not a Bank Business Day, ERCOT will distribute the fees on the next Business Day thereafter that is also a Bank Business Day.
- (3) The Monthly Load Ratio Share per QSE will be based on the final settlement Load for each Operating Day in the month, which is defined according to the timing specified in item (1) of Section 9.5.5, RTM Final Statement.

[NPRR320: Replace Section 7.7.2 above with the following upon system implementation:]

7.7.2 [RESERVED]

NPRR320 – Printable Version

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7.9.3.2 Credit to CRR Balancing Account

If the Day-Ahead Congestion Rent is greater than the total payment to all CRR Owners for the CRRs settled in the DAM for any Operating Hour, a credit is put into the CRR Balancing Account for that Operating Hour. The credit to the CRR Balancing Account for a given Operating Hour is calculated as follows:

$$\text{CRRBACR} = \text{Max } (0, (\text{DACONGRENT} + \text{DACRRCRTOT} + \text{DACRRCHTOT}))$$

Where:

$$\text{DACRRCRTOT} = \text{DAOBLCRTOT} + \text{DAOBLRCRTOT} + \text{DAOPTAMTTOT} + \text{DAOPTRAMTTOT} + \text{DAFGRAMTTOT}$$

$$\text{DACRRCHTOT} = \text{DAOBLCHTOT} + \text{DAOBLRCHTOT}$$

$$\text{DAOBLCRTOT} = \sum_o \text{DAOBLCROTOT}_o$$

$$\text{DAOBLCHTOT} = \sum_o \text{DAOBLCHOTOT}_o$$

$$\text{DAOBLRCRTOT} = \sum_o \text{DAOBLRCROTOT}_o$$

$$\text{DAOBLRCHTOT} = \sum_o \text{DAOBLRCHOTOT}_o$$

$$\text{DAOPTAMTTOT} = \sum_o \text{DAOPTAMTOTOT}_o$$

$$\text{DAOPTRAMTTOT} = \sum_o \text{DAOPTRAMTOTOT}_o$$

$$\text{DAFGRAMTTOT} = \sum_o \text{DAFGRAMTOTOT}_o$$

The above variables are defined as follows:

Variable	Unit	Definition
CRRBACR	\$	<i>CRR Balancing Account Credit</i> —The credit to the CRR Balancing Account for the hour.
DACONGRENT	\$	<i>Day-Ahead Congestion Rent</i> —The congestion rent collected in the DAM for the hour. See Section 7.9.3.1, DAM Congestion Rent.
DACRRCRTOT	\$	<i>Day-Ahead CRR Credit Total</i> —The total payment to all CRR Owners of all CRRs settled in the DAM, for the hour.
DACRRCHTOT	\$	<i>Day-Ahead CRR Charge Total</i> —The total charge to all CRR Owners of all CRRs settled in the DAM, for the hour.

NPRR320 – Printable Version

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Variable	Unit	Definition
DAOBLCRTOT	\$	<i>Day-Ahead Obligation Credit Total</i> —The total payment of all PTP Obligations settled in the DAM, for the hour.
DAOBLCHTOT	\$	<i>Day-Ahead Obligation Charge Total</i> —The total charge of all PTP Obligations settled in the DAM, for the hour.
DAOBLRCRTOT	\$	<i>Day-Ahead Obligation with Refund Credit Total</i> —The total payment of all PTP Obligations with Refund settled in the DAM, for the hour.
DAOBLRCHTOT	\$	<i>Day-Ahead Obligation with Refund Charge Total</i> —The total charge of all PTP Obligations with Refund settled in the DAM, for the hour.
DAOPTAMTTOT	\$	<i>Day-Ahead Option Amount Total</i> —The total payment of all PTP Options settled in the DAM, for the hour.
DAOPTRAMTTOT	\$	<i>Day-Ahead Option with Refund Amount Total</i> —The total payment of all PTP Options with Refund settled in the DAM, for the hour.
DAFGRAMTTOT	\$	<i>Day-Ahead FGR Amount Total</i> —The total payment of all FGRs settled in the DAM, for the hour.
DAOBLCROTOT _o	\$	<i>Day-Ahead Obligation Credit Owner Total per owner</i> —The total payment to CRR Owner <i>o</i> of PTP Obligations settled in the DAM, for the hour. See Section 7.9.1.1, Payments and Charges for PTP Obligations Settled in DAM.
DAOBLCHOTOT _o	\$	<i>Day-Ahead Obligation Charge Owner Total per owner</i> —The total charge to CRR Owner <i>o</i> of PTP Obligations settled in the DAM, for the hour. See Section 7.9.1.1.
DAOBLRCROTOT _o	\$	<i>Day-Ahead Obligation with Refund Credit Owner Total per owner</i> —The total payment to the CRR Owner <i>o</i> of PTP Obligations with Refund settled in the DAM, for the hour. See Section 7.9.1.5, Payments and Charges for PTP Obligations with Refund Settled in DAM.
DAOBLRCHOTOT _o	\$	<i>Day-Ahead Obligation with Refund Charge Owner Total per owner</i> —The total charge to CRR Owner <i>o</i> of PTP Obligations with Refund settled in the DAM, for the hour. See Section 7.9.1.5.
DAOPTAMTOTOT _o	\$	<i>Day-Ahead Option Amount Owner Total per owner</i> —The total payment to the CRR Owner <i>o</i> of PTP Options settled in the DAM, for the hour. See Section 7.9.1.2, Payments for PTP Options Settled in DAM.
DAOPTRAMTOTOT _o	\$	<i>Day-Ahead Option with Refund Amount Owner Total per owner</i> —The total payment to the CRR Owner <i>o</i> of PTP Options with Refund settled in the DAM, for the hour. See Section 7.9.1.6, Payments for PTP Options with Refund Settled in DAM.
DAFGRAMTOTOT _o	\$	<i>Day-Ahead FGR Amount Owner Total per owner</i> —The total payment to the CRR Owner <i>o</i> of FGRs settled in the DAM, for the hour. See Section 7.9.1.4, Payments for FGRs Settled in DAM.
o	none	A CRR Owner.

7.9.3.4 Monthly Refunds to Short-Paid CRR Owners

- (1) On a monthly basis, a refund may be paid to the CRR Owners that have a shortfall charge for any Operating Hour in a month. The refund to each CRR Owner for a given month is calculated as follows:

NPRR320 – Printable Version

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$$\text{CRRRAMT}_o = (-1) * \text{Min}(\text{CRRBACRTOT}, \text{CRRSAMTTOT}) * \text{CRRSAMTRS}_o$$

Where:

$$\text{CRRBACRTOT} = \sum_h \text{CRRBACR}_h$$

If (CRRSAMTTOT = 0)

$$\text{CRRSAMTRS}_o = 0$$

Otherwise

$$\text{CRRSAMTRS}_o = \text{CRRSAMTOTOT}_o / \text{CRRSAMTTOT}$$

$$\text{CRRSAMTTOT} = \sum_o \text{CRRSAMTOTOT}_o$$

$$\text{CRRSAMTOTOT}_o = \sum_h (\text{DACRRSAMT}_{o,h} + \text{RTCRRSAMT}_{o,h})$$

The above variables are defined as follows:

Variable	Unit	Definition
CRRRAMT _o	\$	<i>CRR Refund Amount per owner</i> —The refund to the short-paid CRR Owner <i>o</i> for the month.
CRRBACRTOT	\$	<i>CRR Balancing Account Credit Total</i> —The total of credits accumulated in the CRR Balancing Account for all Operating Hours in the month.
CRRSAMTTOT	\$	<i>CRR Shortfall Amount Total</i> —The total of shortfall charges to all CRR Owners for all Operating Hours in the month.
CRRSAMTRS _o	none	<i>CRR Shortfall Amount Ratio Share per owner</i> —The ratio of the CRR Owner <i>o</i> 's total shortfall-charge to the total of all the CRR Owners' shortfall charges, for the month.
CRRSAMTOTOT _o	\$	<i>CRR Shortfall Amount Owner Total per owner</i> —The total of shortfall charges to CRR Owner <i>o</i> for all Operating Hours in the month.
DACRRSAMT _{o,h}	\$	<i>Day-Ahead CRR Shortfall Amount per owner per hour</i> —The shortfall charge to CRR Owner <i>o</i> for its CRRs settled in the DAM for the hour <i>h</i> .
RTCRRSAMT _{o,h}	\$	<i>Real-Time CRR Shortfall Amount per owner per hour</i> —The shortfall charge to CRR Owner <i>o</i> for its CRRs settled in Real-Time for the hour <i>h</i> .
CRRBACR _h	\$	<i>CRR Balancing Account Credit per hour</i> —The credit to the CRR Balancing Account for the hour <i>h</i> .
h	none	An Operating Hour in the month.
o	none	A CRR Owner.

(2) Additional Monthly Refunds to Short-Paid Day-Ahead CRR Owners

On a monthly basis, additional refunds may be paid to the CRR Owners due to the charges that are caused by Real-Time CRR shortfall, as described in paragraph (4) of

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Section 7.9.3.3, Shortfall Charges to CRR Owners. The refund to each Day-Ahead CRR Owner for a given month is calculated as follows:

$$\text{DACRRRAMT}_o = (-1) * \text{RTCRRSAMTMTOT} * \text{DACRRSAMTRS}_o$$

Where:

$$\text{RTCRRSAMTMTOT} = \sum_h \text{RTCRRSAMTTOT}_h$$

If (RTCRRSAMTMTOT = 0)

$$\text{DACRRSAMTRS}_o = 0$$

Otherwise

$$\text{DACRRSAMTRS}_o = \text{DACRRSRTAMTOTOT}_o / \text{DACRRSRTAMTTOT}$$

$$\text{DACRRSRTAMTTOT} = \sum_o \text{DACRRSRTAMTOTOT}_o$$

$$\text{DACRRSRTAMTOTOT}_o = \sum_h (\text{DACRRSRTAMT}_{o,h})$$

The above variables are defined as follows:

Variable	Unit	Definition
DACRRRAMT_o	\$	Day-Ahead CRR Refund Amount per owner—The additional refund to the Day-Ahead CRR Owner o due to Real-Time shortfall charges for the month.
RTCRRSAMTMTOT	\$	Real-Time CRR Shortfall Amount Monthly Total—The total Real-Time shortfall charge for CRRs settled in Real-Time for the month.
RTCRRSAMTTOT_h	\$	Real-Time CRR Shortfall Amount Total—The total Real-Time shortfall charge for CRRs settled in Real-Time for the hour.
DACRRSAMTRS_o	none	Day-Ahead CRR Short Amount Ratio Share per owner—The ratio of the Day-Ahead CRR Owner o 's additional total shortfall-charge to the total of all the Day-Ahead CRR Owners' additional shortfall charges, for the month.
DACRRSRTAMTOTOT_o	\$	Day-Ahead CRR Short Ratio Real-Time Amount Total per owner—The total of shortfall charges to CRR Owners o for all Operating Hours in the month.
<u>DACRRSRTAMTTOT</u>	<u>\$</u>	<u>Day-Ahead CRR Short Ratio Real-Time Amount Total—The total of shortfall charges for all CRR Owners for all Operating Hours in the month.</u>
$\text{DACRRSRTAMT}_{o,h}$	\$	Day-Ahead CRR Short Ratio Real-Time Amount per owner—The shortfall charge to CRR Owner o for its CRRs settled in the DAM due to Real-Time CRR Shortfall Amount for the hour.
h	none	An Operating Hour in the month.
o	none	A CRR Owner.

[NPRR320: Replace Section 7.9.3.4 above with the following upon system implementation:]

7.9.3.4 Monthly Refunds to Short-Paid CRR Owners

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(1) On a monthly basis, a refund may be paid to the CRR Owners that have a shortfall charge for any Operating Hour in a month. The refund to each CRR Owner for a given month is calculated as follows:

$$\text{CRRRAMT}_o = \frac{(-1) * \text{Min}(\text{CRRBACRTOT} + \text{CRRFEETOT}, \text{CRRSAMTTOT}) * \text{CRRSAMTRS}_o}{\text{CRRSAMTTOT}}$$

Where:

$$\text{CRRBACRTOT} = \sum_h \text{CRRBACR}_h$$

$$\text{CRRFEETOT} = \sum_{crrh} \sum_a (\text{OPTAFAMT}_{crrh, a})$$

$$\text{If } (\text{CRRSAMTTOT} = 0) \\ \text{CRRSAMTRS}_o = 0$$

$$\text{Otherwise} \\ \text{CRRSAMTRS}_o = \text{CRRSAMTOTOT}_o / \text{CRRSAMTTOT}$$

$$\text{CRRSAMTTOT} = \sum_o \text{CRRSAMTOTOT}_o$$

$$\text{CRRSAMTOTOT}_o = \sum_h (\text{DACRRSAMT}_{o, h} + \text{RTCRRSAMT}_{o, h})$$

The above variables are defined as follows:

Variable	Unit	Definition
<u>CRRRAMT_o</u>	\$	<u>CRR Refund Amount per owner</u> —The refund to the short-paid CRR Owner <i>o</i> for the month.
<u>CRRBACRTOT</u>	\$	<u>CRR Balancing Account Credit Total</u> —The total of credits accumulated in the CRR Balancing Account for all Operating Hours in the month.
<u>CRRSAMTTOT</u>	\$	<u>CRR Shortfall Amount Total</u> —The total of shortfall charges to all CRR Owners for all Operating Hours in the month.
<u>CRRSAMTRS_o</u>	none	<u>CRR Shortfall Amount Ratio Share per owner</u> —The ratio of the CRR Owner <i>o</i> 's total shortfall-charge to the total of all the CRR Owners' shortfall charges, for the month.
<u>CRRSAMTOTOT_o</u>	\$	<u>CRR Shortfall Amount Owner Total per owner</u> —The total of shortfall charges to CRR Owner <i>o</i> for all Operating Hours in the month.
<u>DACRRSAMT_{o, h}</u>	\$	<u>Day-Ahead CRR Shortfall Amount per owner per hour</u> —The shortfall charge to CRR Owner <i>o</i> for its CRRs settled in the DAM for the hour <i>h</i> .
<u>RTCRRSAMT_{o, h}</u>	\$	<u>Real-Time CRR Shortfall Amount per owner per hour</u> —The shortfall charge to CRR Owner <i>o</i> for its CRRs settled in Real-Time for the hour <i>h</i> .
<u>CRRBACR_h</u>	\$	<u>CRR Balancing Account Credit per hour</u> —The credit to the CRR Balancing Account for the hour <i>h</i> .

NPRR320 – Printable Version

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<u>CRRFEETOT</u>	\$	<u>CRR Auction Fee Total</u> —The sum of the PTP Option Award Fees charged to all CRR Account Holders in single-month or multi-month CRR Auctions for the month.
<u>OPTAFAMT_{crrh, a}</u>	\$	<u>PTP Option Award Fee Amount per CRR Account Holder per CRR Auction</u> —The fee assessed to CRR Account Holder <i>crrh</i> for PTP Option awards awarded in CRR Auction <i>a</i> , for the hour for which the clearing price is less than the defined Minimum PTP Option Bid Price for the month. For a multi-month CRR Auction, the fee shall be calculated for each month.
<u>h</u>	none	<u>An Operating Hour in the month.</u>
<u>o</u>	none	<u>A CRR Owner.</u>
<u>crrh</u>	none	<u>A CRR Account Holder.</u>
<u>a</u>	none	<u>A CRR Auction</u>

(2) Additional Monthly Refunds to Short-Paid Day-Ahead CRR Owners

On a monthly basis, additional refunds may be paid to the CRR Owners due to the charges that are caused by Real-Time CRR shortfall, as described in paragraph (4) of Section 7.9.3.3, Shortfall Charges to CRR Owners. The refund to each Day-Ahead CRR Owner for a given month is calculated as follows:

$$\underline{\text{DACRRRAMT}_o} = (-1) * \text{RTCRRSAMTMTOT} * \underline{\text{DACRRSAMTRS}_o}$$

Where:

$$\underline{\text{RTCRRSAMTMTOT}} = \sum_h \underline{\text{RTCRRSAMTTOT}_h}$$

If (RTCRRSAMTMTOT = 0)

$$\underline{\text{DACRRSAMTRS}_o} = 0$$

Otherwise

$$\underline{\text{DACRRSAMTRS}_o} = \underline{\text{DACRRSRTAMTOTOT}_o} / \underline{\text{DACRRSRTAMTTOT}}$$

$$\underline{\text{DACRRSRTAMTTOT}} = \sum_o \underline{\text{DACRRSRTAMTOTOT}_o}$$

$$\underline{\text{DACRRSRTAMTOTOT}_o} = \sum_h (\underline{\text{DACRRSRTAMT}_{o, h}})$$

The above variables are defined as follows:

<u>Variable</u>	<u>Unit</u>	<u>Definition</u>
<u>DACRRRAMT_o</u>	\$	<u>Day-Ahead CRR Refund Amount per owner</u> —The additional refund to the Day-Ahead CRR Owner <i>o</i> due to Real-Time shortfall charges for the month.
<u>RTCRRSAMTMTOT</u>	\$	<u>Real-Time CRR Shortfall Amount Monthly Total</u> —The total Real-Time shortfall charge for CRRs settled in Real-Time for the month.

NPRR320 – Printable Version

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<u>RTCRRSAMTTOT_h</u>	\$	<u>Real-Time CRR Shortfall Amount Total</u> —The total Real-Time shortfall charge for CRRs settled in Real-Time for the hour.
<u>DACRRSAMTRS_o</u>	none	<u>Day-Ahead CRR Short Amount Ratio Share per owner</u> —The ratio of the Day-Ahead CRR Owner <i>o</i> 's additional total shortfall-charge to the total of all the Day-Ahead CRR Owners' additional shortfall charges, for the month.
<u>DACRRSRTAMTTOT_o</u>	\$	<u>Day-Ahead CRR Short Ratio Real-Time Amount Total per owner</u> —The total of shortfall charges to CRR Owner <i>o</i> for all Operating Hours in the month.
<u>DACRRSRTAMTTOT</u>	\$	<u>Day-Ahead CRR Short Ratio Real-Time Amount Total</u> —The total of shortfall charges for all CRR Owners for all Operating Hours in the month.
<u>DACRRSRTAMT_{o,h}</u>	\$	<u>Day-Ahead CRR Short Ratio Real-Time Amount per owner</u> —The shortfall charge to CRR Owner <i>o</i> for its CRRs settled in the DAM due to Real-Time CRR Shortfall Amount for the hour.
<u>h</u>	none	<u>An Operating Hour in the month.</u>
<u>o</u>	none	<u>A CRR Owner.</u>

7.9.3.5 CRR Balancing Account Closure

- After calculation of refunds described in Section 7.9.3.4, Monthly Refunds to Short-Paid CRR Owners, any surplus that remains in the CRR Balancing Account, is paid to the QSEs representing Load Serving Entities (LSEs) based on a monthly Load Ratio Share. The monthly Load Ratio Share is the 15-minute Load Ratio Share calculated for the peak-load Settlement Interval during the month.
- The credit to each QSE representing LSEs for a given month is calculated as follows:

$$\text{LACRRAMT}_q = (-1) * (\text{CRRBACRTOT} + \text{CRRRAMTTOT}) * \text{MLRS}_q$$

Where:

$$\text{CRRRAMTTOT} = \sum_o \text{CRRRAMT}_o$$

The above variables are defined as follows:

Variable	Unit	Definition
LACRRAMT_q	\$	<u>Load-Allocated CRR Amount per QSE</u> —The allocated surplus in the CRR Balancing Account at the end of the month to QSE <i>q</i> , based on Load Ratio Share for the month.
CRRBACRTOT	\$	<u>CRR Balancing Account Credit Total</u> —The total credit accumulated in the CRR Balancing Account during the month. See its calculation in Section 7.9.3.4.
CRRRAMTTOT	\$	<u>CRR Refund Amount Total</u> —The total refund to all the previously short-paid CRR Owners at the end of the month.
CRRRAMT_o	\$	<u>CRR Refund Amount per owner</u> —The refund credited to the CRR Owner <i>o</i> at the end of the month.

NPRR320 – Printable Version

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Variable	Unit	Definition
MLRS _q	none	<i>Monthly Load Ratio Share per QSE</i> —The Load Ratio Share calculated for QSE <i>q</i> for the 15-minute monthly peak-load Settlement Interval. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval, for the calculation of Load Ratio Share for a 15-Minute Settlement Interval.
q	none	A QSE.
o	none	A CRR Owner.

[NPRR320: Replace Section 7.9.3.5 above with the following upon system implementation:]

7.9.3.5 CRR Balancing Account Closure

(1) After calculation of refunds described in Section 7.9.3.4, Monthly Refunds to Short-Paid CRR Owners, any surplus that remains from the CRR Balancing Account and CRR Auction fees is paid to the QSEs representing Load Serving Entities (LSEs) based on a monthly Load Ratio Share. The monthly Load Ratio Share is the 15-minute Load Ratio Share calculated for the peak-load Settlement Interval during the month.

(2) The credit to each QSE representing LSEs for a given month is calculated as follows:

$$\text{LACRRAMT}_{q} = \frac{(-1) * (\text{CRRBACRTOT} + \text{CRRFEETOT} + \text{CRRRAMTTOT}) * \text{MLRS}_{q}}{\text{CRRRAMTTOT}}$$

Where:

$$\text{CRRRAMTTOT} = \sum_o \text{CRRRAMT}_o$$

The above variables are defined as follows:

Variable	Unit	Definition
LACRRAMT _q	\$	<i>Load-Allocated CRR Amount per QSE</i> —The allocated surplus from the CRR Balancing Account and CRR Auction fees at the end of the month to QSE <i>q</i> , based on Load Ratio Share for the month.
CRRBACRTOT	\$	<i>CRR Balancing Account Credit Total</i> —The total credit accumulated in the CRR Balancing Account during the month. See its calculation in Section 7.9.3.4.
CRRFEETOT	\$	<i>CRR Auction Fee Total</i> —The sum of the PTP Option Award Fees charged to all CRR Account Holders in <u>single-month or multi-month CRR Auctions</u> for the month.
CRRRAMTTOT	\$	<i>CRR Refund Amount Total</i> —The total refund to all the previously short-paid CRR Owners at the end of the month.
CRRRAMT _o	\$	<i>CRR Refund Amount per owner</i> —The refund credited to the CRR Owner <i>o</i> at the end of the month.

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<u>MLRS_q</u>	<u>none</u>	<u>Monthly Load Ratio Share per QSE—The Load Ratio Share calculated for QSE <i>q</i> for the 15-minute monthly peak-load Settlement Interval. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval, for the calculation of Load Ratio Share for a 15-Minute Settlement Interval.</u>
<u>q</u>	<u>none</u>	<u>A QSE.</u>
<u>o</u>	<u>none</u>	<u>A CRR Owner.</u>

9.8 CRR Auction Award Invoices

- (1) ERCOT shall prepare invoices for each CRR Auction (CRR Auction Invoice) on a net basis. Invoices must be issued on the first Business Day following the completion of a CRR Auction on the date specified in the Settlement Calendar. For each CRR Auction Invoice, the CRR Account Holder to whom the Invoice is addressed (“Invoice Recipient”) is either a net payee or net payor. The Invoice Recipient is responsible for accessing the CRR Auction Invoice on the MIS Certified Area once posted by ERCOT.
- (2) Each Invoice Recipient shall pay any net debit and be entitled to receive any net credit shown on the CRR Auction Invoice on the payment due date. Payments for CRR Auction Invoices are due on the applicable payment due date, whether or not there is any Settlement and Billing dispute regarding the amount of the payment.
- (3) ERCOT shall post on the MIS Certified Area for each Invoice Recipient a CRR Auction Invoice based on CRR Auction charges and payments as set forth in:
 - (a) Section 7.5.6.1, Payment of an Awarded CRR Auction Offer;
 - (b) Section 7.5.6.2, Charge of an Awarded CRR Auction Bid; ~~and~~ and
 - (c) Section 7.5.6.3, Charge of PCRRs Pertaining to a CRR Auction; ~~and~~

[NPRR320: Insert paragraph (3)(d) upon system implementation:]

(d) Section 7.7, Point-to-Point (PTP) Option Award Fee.

- (4) CRR Auction Invoices must contain the following information:
 - (a) The Invoice Recipient’s name;
 - (b) The ERCOT identifier (Settlement identification number issued by ERCOT);

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- (c) Net Amount Due/Payable – the aggregate summary of all charges owed to or due from the Invoice Recipient summarized by CRR Auction;
- (d) Time Period – the CRR Auction for which the Invoice is generated;
- (e) Run Date – the date on which ERCOT created and published the Invoice;
- (f) Invoice Reference Number – a unique number generated by ERCOT for payment tracking purposes;
- (g) Product Description – a description of each product awarded in, sold in, or allocated before the CRR Auction, or of any applicable fee;
- (h) Payment Date – the date and time that Invoice amounts are to be paid or received; and
- (i) Remittance Information Details – details including the account number, bank name and electronic transfer instructions of the ERCOT account to which any amounts owed by the Invoice Recipient are to be paid or of the Invoice Recipient's account from which ERCOT may draw payments due.