

2.5.28.4 Replacement Reserve. The user rate per unit of **purchased**

Replacement Reserve obligation for each Settlement Period t for each Zone x

shall be as follows:

$$ReplRate_{xt} = \frac{(PRepResDA_{xt} * OrigReplReqDA_{xt}) + (PRepResHA_{xt} * OrigReplReqHA_{xt})}{OrigReplReqDA_{xt} + OrigReplReqHA_{xt}}$$

$$ReplRate_{xt} = \frac{ReplPayTotalDA_{xt} + ReplPayTotalHA_{xt} - ReplBuyBackTotal_{xt}}{ReplObligTotal_{xt}}$$

where

$OrigReplReqDA_{xt}$ = Replacement Reserve requirement net of self-provision in the Day-Ahead Market before consideration of any substitutions pursuant to Section 2.5.3.6.

$OrigReplReqHA_{xt}$ = Incremental change in the Replacement Reserve requirement net of self-provision between the Day-Ahead Market and the Hour-Ahead Market before consideration of any substitutions pursuant to Section 2.5.3.6.

$PRepResDA_{xt}$ is the Market Clearing Price for Replacement Reserve in the Day-Ahead Market for Zone x in Settlement Period t .

$PRepResHA_{xt}$ is the Market Clearing Price for Replacement Reserve in the Hour-Ahead Market for Zone x in Settlement Period t .

$ReplPayTotalDA_{xt}$ = Total Replacement Reserve payments for the Settlement Period t in the Day-Ahead Market for the Zone x .

$ReplPayTotalHA_{xt}$ = Total Replacement Reserve payments for the Settlement Period t in the Hour-Ahead Market for the Zone x .

ReplBuyBackTotal = payments from Scheduling Coordinators buying back Ancillary Service capacity sold in the Day-Ahead Market or replacing capacity that was self-provided in the Day-Ahead Market.

ReplObligTotal_{xt} = the total ISO Replacement Reserve requirement procured in the Day-Ahead Market and Hour-Ahead Market for the Settlement Period t for the Zone x, less that which has been self-provided by Scheduling Coordinators.

For each Settlement Period *t*, each Scheduling Coordinator shall pay to the ISO a sum calculated as follows for each Zone *x*:

$$ReplRate_{xt} * ReplOblig_{jxt}$$

where

$$ReplOblig_{jxt} = DevReplOblig_{jxt} + RemRepl_{jxt} - SelfProv_{jxt} + NetInterSCTrades_{jxt}$$

DevReplOblig_{jxt} is the Scheduling Coordinator's obligation for deviation Replacement Reserve in the Zone *x* in the Settlement Period *t* and *RemRepl_{jxt}* is the Scheduling Coordinator's obligation for remaining Replacement Reserve in Zone *x* for Settlement Period *t*.

SelfProv_{jxt} is Scheduling Coordinator's Replacement Reserve self provision in Zone *x* for Settlement Period *t*.

NetInterSCTrades_{jxt} is the sale of Replacement Reserve less the purchase of Replacement Reserve through Inter-Scheduling Coordinator Trades by Scheduling Coordinator *j* in Zone *x* for Settlement Period *t*.

Deviation Replacement Reserve for Scheduling Coordinator *j* in Zone *x* for Settlement Period *t* is calculated as follows:

If *ReplObligTotal_{xt}* > *DevReplOblig_{xt}* TotalDeviations_{xt} then:

$$DevReplOblig_{xjt} = \left[\text{Max} \left(0, \sum_i \text{GenDev}_{ijxt} \right) - \text{Min} \left(0, \sum_i \text{LoadDev}_{ijxt} \right) \right]$$

If $ReplObligTotal_{xt} < DevReplOblig_{xt} + TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \frac{ReplObligTotal_{xt}}{DevReplOblig_{xt}} * \left[Max\left(0, \sum_i GenDev_{ixt}\right) - Min\left(0, \sum_i LoadDev_{ixt}\right) \right]$$

$$DevReplOblig_{xjt} = \frac{ReplObligTotal_{xt}}{TotalDeviations_{xt}} * \left[Max\left(0, \sum_i GenDev_{ixt}\right) - Min\left(0, \sum_i LoadDev_{ixt}\right) \right]$$

where,

$$TotalDeviations_{xt} = \sum_j \left[Max\left(0, \sum_i GenDev_{ixt}\right) - Min\left(0, \sum_i LoadDev_{ixt}\right) \right]$$

$GenDev_{ixt}$ = The deviation between scheduled and actual Energy generation for Generator i represented by Scheduling Coordinator j in Zone x during Settlement Period t as referenced in Section 11.2.4.1.

$LoadDev_{ixt}$ = The deviation between scheduled and actual Load consumption for resource i represented by Scheduling Coordinator j in Zone x during Settlement Period t as referenced in Section 11.2.4.1.

$DevReplOblig_{xt}$ is total deviation Replacement Reserve in Zone x for Settlement Period t.

$ReplObligTotal_{xt}$ is total Replacement Reserve Obligation (including self-provision) in Zone x for Settlement Period t.

Remaining Replacement Reserve for Scheduling Coordinator j in Zone x for Settlement Period t is calculated as follows:

$$RemRepl_{xjt} = \frac{MeteredDemand_{jxt}}{TotalMeteredDemand_{xt}} * TotalRemRepl_{xt}$$

where:

MeteredDemand_{xt} is the Scheduling Coordinator's total metered Demand excluding exports in Zone x for Settlement Period t.

TotalMeteredDemand_{xt} is total metered Demand excluding exports in Zone x for Settlement Period t.

$$TotalRemRep_{xt} = Max[0, RepObligTotal_{xt} - DevRepOblig_{xt}]$$

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C 2.2.3 Replacement Reserve. The user rate per unit of **purchased** Replacement Reserve obligation for each Settlement Period t for each Zone x shall be as follows:

$$ReplRate_{xt} = \frac{(PRepResDA_{xt} * OrigReplReqDA_{xt}) + (PRepResHA_{xt} * OrigReplReqHA_{xt})}{OrigReplReqDA_{xt} + OrigReplReqHA_{xt}}$$

$$ReplRate_{xt} = \frac{ReplPayTotalDA_{xt} + ReplPayTotalHA_{xt} + ReplBuyBackTotal_{xt}}{ReplObligTotal_{xt}}$$

where:

$OrigReplReqDA_{xt}$ = Replacement Reserve requirement net of self-provision in the Day-Ahead Market before consideration of any substitutions pursuant to Section 2.5.3.6.

$OrigReplReqHA_{xt}$ = Incremental change in the Replacement Reserve requirement net of self-provision between the Day-Ahead Market and the Hour-Ahead Market before consideration of any substitutions pursuant to Section 2.5.3.6.

$PRepResDA_{xt}$ is the Market Clearing Price for Replacement Reserve in the Day-Ahead for Zone x in Settlement Period t .

$PRepResHA_{xt}$ is the Market Clearing Price for Replacement Reserve in the Hour-Ahead for Zone x in Settlement Period t .

$ReplPayTotalDA_{xt}$ = Total Replacement Reserve payments for the Settlement Period t in the Day-Ahead Market for the Zone x .

$ReplPayTotalHA_{xt}$ = Total Replacement Reserve payments for the Settlement Period t in the Hour-Ahead Market for the Zone x .

~~ReplBuyBackTotal = payments from Scheduling Coordinators buying back Ancillary Service capacity sold in the Day-Ahead Market or replacing capacity that was provided in the Day-Ahead Market.~~

~~ReplObligTotal_{xt} = the total ISO Replacement Reserve requirement procured in the Day Ahead Market and the Hour-Ahead Market for the Settlement Period t for the Zone x; less that which has been self-provided by Scheduling Coordinators.~~

For each Settlement Period t, each Scheduling Coordinator shall pay to the ISO a sum calculated as follows for each Zone x:

$$ReplRate_{xt} * ReplOblig_{jxt}$$

where

$$ReplOblig_{jxt} = DevReplOblig_{jxt} + RemRepl_{jxt} - SelfProv_{jxt} + NetInterSCTrades_{jxt}$$

~~DevReplOblig_{jxt} is the Scheduling Coordinator's obligation for deviation Replacement Reserve in the Zone x in the Settlement Period t and RemRepl_{jxt} is the Scheduling Coordinator's obligation for remaining Replacement Reserve in Zone x for Settlement Period t.~~

~~SelfProv_{jxt} is Scheduling Coordinator's Replacement Reserve self provision in Zone x for Settlement Period t.~~

~~NetInterSCTrades_{jxt} is the sale of Replacement Reserve less the purchase of Replacement Reserve through Inter-Scheduling Coordinator Trades by Scheduling Coordinator j in Zone x for Settlement Period t.~~

Deviation Replacement Reserve for Scheduling Coordinator j in Zone x for Settlement Period t is calculated as follows:

If $ReplObligTotal_{xt} > DevReplOblig_{jxt} + TotalDeviations_{xt}$ then:

$$\underline{DevReplOblig_{xjt} = \left[\text{Max} \left(0, \sum_i \text{GenDev}_{ijxt} \right) - \text{Min} \left(0, \sum_i \text{LoadDev}_{ijxt} \right) \right]}$$

If $ReplObligTotal_{xt} < \text{DevReplOblig}_{xt} \text{TotalDeviations}_{xt}$ then:

$$\cancel{DevReplOblig_{xjt} = \frac{ReplObligTotal_{xt}}{DevReplOblig_{xt}} * \left[\text{Max} \left(0, \sum_i \text{GenDev}_{ijxt} \right) - \text{Min} \left(0, \sum_i \text{LoadDev}_{ijxt} \right) \right]}$$

$$\underline{DevReplOblig_{xjt} = \frac{ReplObligTotal_{xt}}{TotalDeviations_{xt}} * \left[\text{Max} \left(0, \sum_i \text{GenDev}_{ijxt} \right) - \text{Min} \left(0, \sum_i \text{LoadDev}_{ijxt} \right) \right]}$$

where,

$$\underline{TotalDeviations_{xt} = \sum_j \left[\text{Max} \left(0, \sum_i \text{GenDev}_{ijxt} \right) - \text{Min} \left(0, \sum_i \text{LoadDev}_{ijxt} \right) \right]}$$

$GenDev_{ijxt}$ = The deviation between scheduled and actual Energy generation for Generator i represented by Scheduling Coordinator j in Zone x during Settlement Period t as referenced in Section 11.2.4.1.

$LoadDev_{ijxt}$ = The deviation between scheduled and actual Load consumption for resource i represented by Scheduling Coordinator j in Zone x during Settlement Period t as referenced in Section 11.2.4.1.

$DevReplOblig_{xt}$ is total deviation Replacement Reserve in Zone x for Settlement Period t.

$ReplObligTotal_{xt}$ is total Replacement Reserve Obligation (including self-provision) in Zone x for Settlement Period t.

Remaining Replacement Reserve for Scheduling Coordinator j in Zone x for Settlement Period t is calculated as follows:

$$RemRepl_{xjt} = \frac{MeteredDemand_{jxt}}{TotalMeteredDemand_{xt}} * TotalRemRepl_{xt}$$

where:

$MeteredDemand_{jxt}$ is the Scheduling Coordinator's total metered Demand excluding exports in Zone x for Settlement Period t.

$TotalMeteredDemand_{xt}$ is total metered Demand excluding exports in Zone x for Settlement Period t.

$$TotalRemRepl_{xt} = Max[0, ReplObligTotal_{xt} - DevReplOblig_{xt}]$$