FERC Order 755 Frequency Regulation Compensation – part IV

David Edelson
Energy Market Products
Market Issues Working Group (MIWG)
March 22, 2012

Background

- On Jan 19th, Feb 2nd, and Mar 2nd 2012, NYISO presented its proposal to comply with FERC Order 755 regarding Frequency Regulation Compensation.
- Those presentations can be found at:
  http://www.nyiso.com/public/webdocs/committees/bic_miwg/meeting_materials/2012-01-19/Reg_Compensation.pdf

  http://www.nyiso.com/public/webdocs/committees/bic_miwg/meeting_materials/2012-02-02/Order755RegulationCompensation.pdf

  http://www.nyiso.com/public/webdocs/committees/bic_miwg/meeting_materials/2012-03-02/Mar2ndMIWG-Order755RegulationCompensation.pdf
- This presentation provides details on one additional Order 755 proposal topic not included in the previous presentations (DAMAP) as well as an overview of the required tariff revisions in support of this proposal.

DAMAP

- DAMAP protects Suppliers' Day-Ahead Margins associated with real-time reductions after accounting for any real-time profits associated with offsetting increases in real-time Energy, Regulation Service, or Operating Reserve Schedules
- The existing DAMAP formulas shall be modified to include the real-time profits associated with Regulation Movement.
  - *Current DAMAP:*

    If Real-Time Regulation Service Schedule < DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x (RT Reg. market price – DAM Reg. bid)

    If Real-Time Regulation Service Schedule ≥ DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x Max (0, RT Reg. market price – RT Reg. bid)

  - *Proposed change to DAMAP:*

    If Real-Time Regulation Service Schedule < DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x (RT Reg. market price – DAM Reg. bid)

    + (-1 x RT Movement MWs) x Max (0, RT Reg. movement market price – RT Reg. movement bid)

    If Real-Time Regulation Service Schedule ≥ DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x Max (0, RT Reg. market price – RT Reg. bid)

    + (-1 x RT Movement MWs) x Max (0, RT Reg. movement market price – RT Reg. movement bid)

DAMAP for LESRs

- The existing DAMAP formulas shall be modified to include the real-time profits associated with Regulation Movement. No different than non-LESRs.

- Secondly, the formula shall be modified to include the PI in the formula only when the Reg Capacity Market Price in RT is greater than the DAM Reg Capacity bid price and the Regulation Capacity Schedule in RT is less than in the DAM. The NYISO is not including a PI when the price in RT is less than the DAM bid price as such a calculation would actually reward that resource for poor performance by lessening the offsetting profit.
  - *Proposed change to DAMAP for LESRs:*

    If Real-Time Regulation Service Schedule < DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x (RT Reg. market price – DAM Reg. bid) x (RTD PI)**

    + (-1 x RT Movement MWs) x Max (0, RT Reg. movement market price – RT Reg. movement bid)

    If Real-Time Regulation Service Schedule ≥ DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x (RT Reg. market price – DAM Reg. bid)

    + (-1 x RT Movement MWs) x Max (0, RT Reg. movement market price – RT Reg. movement bid)

***Only include RTD PI when RT Reg Capacity Market Price is greater than DAM Reg Capacity Bid*

Tariff changes

- Overall - MST
  - *Wherever "Regulation Service" is specified, changed to "Regulation Capacity" where applicable, or left as "Regulation Service" when the term applied to both Regulation Capacity and Regulation Movement.*

- Definitions - MST
  - *Definitions for the following new terms:*
    - Market Price
    - Regulation Capacity
    - Regulation Movement
    - Regulation Service

- Section 4.5 – Real-Time Market Settlements - MST
  - *Changed "injections" to "service" when referring to Regulation settlements for Resources supplying Regulation Service.*

Tariff changes

- Rate Schedule 3 (Reg. Payments) – MST
  - *15.3.2.1 – Bidding Process*
    - Added 6-second response rate to the information required with each bid.
  - *15.3.4.1 – Calculation of Day-Ahead Regulation Prices*
    - Updated to reflect the way in which Day-Ahead Market Prices are calculated for Regulation Capacity, as further described in the Appendix of this presentation.
  - *15.3.5.1, 15.3.5.2 - Calculation of Real-Time Regulation Prices*
    - Updated to reflect the way in which Real-Time Market Prices are calculated for Regulation Capacity and Movement, as further described in the Appendix of this presentation.
  - *15.3.5.5 – Payments and Performance Based Adjustments for Regulation Service Providers*
    - Updated to reflect the introduction of a Movement payment, as well as modifications to the Regulation Capacity and Performance Charges, as further described in the Appendix of this presentation.

Tariff changes

- Rate Schedule 3A (Charges to Suppliers not Providing Reg.) – MST
  - *Change the price that is used in the following calculations to use the maximum of the RT or DAM Regulation Capacity Market Price.*
    - 15.3A.1 Persistent Undergeneration Charges
      15.3A.1.1 Overgeneration Charges
      15.3A.2 Restoration of Performance Charges
- Att. C (BPCG) – MST
  - *Modify the NASR portion of the formulas to take into account any financial losses incurred from providing Regulation Service.*
  - *Modify the eligibility rules to make LESRs eligible for BPCG.*

Tariff changes

- Att. F (Temporary Bid Caps) – MST
  - *Added language for the new Regulation Movement bid cap.*

- Att. J (DAMAP) – MST
  - *Modify the formulas to account for the profits from Regulation Movement in the formulas for all types of resources, as further described in the Appendix of this presentation.*
  - *Modify the LESR-specific formulas to conditionally include PI, as further described in the Appendix of this presentation.*

Tariff changes

- Att. H (Mitigation) – MST
  - *23.3.1.2.1.2 – Conduct test for economic withholding in 23.3.1.2.1.2 will apply to Regulation Capacity Bids.*
  - *New conduct test will be added for Regulation Movement Bids: A 300 percent increase.*
  - *23.3.1.4.6 – Include Regulation Capacity as a product for which the ISO is not required to calculate real-time reference levels (since Real-Time Bid must be zero).*

- Rate Schedule 3 (Charges for Reg. Service) – OATT
  - *6.3.2 Charges to LSEs – Various section numbers updated to reflect changes made to Rate Schedule 3 of MST*

Appendix
Full proposal with examples

FERC Order Requirements (recap)

- Must compensate resources with a Regulation Capacity payment that includes lost opportunity costs.
- Must additionally compensate resources based on their actual Regulation performance.
- Two-part Regulation bid required.
- Uniform Regulation Settlement Price must be market based.
- Must treat all resources equally when measuring accuracy responding to regulation signals.
- Tariff amendments due April 28th, 2012.
- Implementation complete October 25th, 2012.

NYISO proposal in a nutshell

- Market Participants will offer both a Regulation Capacity bid price (as they do today) and a new Regulation Movement bid price for both the Day-Ahead Market (DAM) and the Real-Time Market (RTS). They will also provide a six-second Regulation Response Rate, in addition to the five-minute Regulation Response Rate.

- Both DAM and RTS will optimize Regulation offers using the combined Capacity bid price and the Movement bid price of each bidder (the two bid components are summed together into a single value).

- Suppliers with DAM Regulation Capacity Schedules will be paid for scheduled Regulation Capacity using the DAM Regulation Capacity Market Price.

- Suppliers with RTD Regulation Capacity Schedules will be paid for incremental (above the DAM scheduled) Regulation Capacity using the RTD Regulation Capacity Market Price.

- Suppliers with RTD Regulation Capacity Schedules will also be paid for the absolute number of MWs they were instructed to move in real-time by AGC for ACE correction. This settlement will use the RT Regulation Movement Market Price.

Day-Ahead

- The Regulation bid price for each Resource passed into the DAM evaluation is the sum of each bidder's Regulation Capacity bid price plus a weighted Regulation Movement bid price
  - *NYISO recognizes that this involves combining bid prices for different units of measure ($/MWhr$_{energy}$ and $/MW$_{movement}$).*
  - *Summing them together provides a simple mechanism to prevent creating incentives for very expensive movement offers and very low capacity offers.*

- DAM Regulation Capacity Market Price
  - *The DAM Regulation Capacity Market Price will reflect only a price for Regulation Capacity, including lost opportunity costs; It will be set as the Regulation Capacity bid price plus lost opportunity cost (as determined by the optimization) of the marginal unit.*
  - *It is possible that the DAM Regulation Capacity Market Price will not always be sufficient to cover the bid-in Regulation Capacity costs of all cleared resources due to the two-part bidding that is being summed together. Modifications to Day-Ahead BPCG will be necessary to deal with this outcome.*

- DAM Settlement is:

  DAM Regulation Capacity Schedule * DAM Regulation Capacity Market Price

- There is no Regulation Movement scheduled in the DAM. Only a Capacity schedule is awarded. There will also be no DAM Regulation Movement Market Price.

Real-Time

- The Regulation bid price for each Resource passed into each RTS evaluation is the sum of each bidder's real-time Regulation Capacity bid price plus the weighted real-time Regulation Movement bid price.
  - *Similar to other ancillary products for capacity – the real-time Regulation Capacity bid price must be zero;*
  - *Market Participants may not increase their Regulation Movement bid price above their accepted DAM Regulation Movement bid price.*

- Real-Time Regulation Capacity Market Prices
  - *Regulation Capacity Market Prices exclude bid prices for Regulation Movement; It will be set as the lost opportunity cost (as determined by the optimization) of the marginal unit.*

- Real-Time Regulation Movement Market Prices
  - *Regulation Movement Market Prices will be set at the Regulation Movement pid price of the marginal unit for the interval;*
  - *It is possible that the Real-Time Regulation Movement Market Price will not always be sufficient to cover the bid-in Regulation Movement costs of all cleared resources. Modifications to RT BPCG will be necessary to deal with this outcome.*

- There is no Regulation Movement scheduled in RTS. Only a Regulation Capacity schedule is awarded.

- RT Settlement for Regulation Capacity is:

  (RTD Regulation Capacity Schedule - DAM Regulation Capacity Schedule) * RT Regulation Capacity Market Price

Movement Bid Weighting

- Prior iterations of the proposal only talked about summing the Regulation Capacity and Regulation Movement bid prices together, essentially treating them as equal measures.
- As we have analyzed historical regulation movement (through manual reverse engineering of the data), it is clear that we experience significantly more than a 1:1 ratio of Movement MWs to Capacity MWh. The long-term average ratio appears to be somewhere between 8:1 to 12:1.
  - *In other words, for each MWh of Regulation Capacity the markets procure, we expect to have anywhere from 8-to-12 MWs of Regulation Movement.*
  - *To illustrate: if the market procures 200MWh of Regulating Capacity, we can expect that, on average, we will instruct anywhere from 1,600 – 2,400 MWs of Regulation Movement across all of the regulating units over the course of the hour.*
  - *Caveat: These numbers are illustrative only. We are still in the process of refining our estimates of historical movement.*

Movement Bid Weighting

- Given our understanding of the actual regulation movement that occurs, simply summing the two bid components together with equal weightings would undervalue the cost of a bidder with a low Regulation Capacity bid price and a relatively high Regulation Movement bid price, since we are likely to instruct that resource to move many MWs for each MWh of Capacity they offer.
- Therefore, we will weight/multiply Regulation Movement bid prices by the historical ratio of Regulation Movement MW:Regulation Capacity MWh.
- All Regulation Movement Bids will be weighted by the same multiplier.
  - *By using a uniform NYCA-wide multiplier on all units' bids, we ensure a consistent evaluation of all regulation bid costs.*
- As mentioned on the previous slide, we have not completed our analysis of the historical ratios of Regulation Movement:Regulation Capacity. Therefore, the precise multiplier that will be used has not yet been finalized.
- Similar to the Reserve Demand Curves, the multiplier will be re-evaluated periodically. In addition, should the multiplier cause an operational or reliability problem the ISO may modify it and provide notice to the BIC.

Movement Bid Weighting

Example

Provider	Regulation Capacity Bid (MWh)	Regulation Capacity Bid ($)	Regulation Movement Bid ($)	Weighted Movement Bid $ (assume weight of 10)	Composite Bid ($)	Rank
A	20	$6.75	$0.00	**$0.00**	$6.75	4
B	100	$2.00	$1.00	**$10.00**	$12.00	5
C	25	$0.00	$3.00	**$30.00**	$30.00	8
D	25	$2.50	$0.10	**$1.00**	$3.50	2
E	35	$2.51	$0.20	**$2.00**	$4.51	3
F	10	$15.00	$0.00	**$0.00**	$15.00	6
G	10	$1.00	$2.00	**$20.00**	$21.00	7
H	100	$1.00	$0.21	**$2.10**	$3.10	1
I	20	$6.75	$4.00	**$40.00**	$46.75	9

Movement

- Every six-seconds, the NYISO dispatches Regulation-scheduled Resources with an allocated share of the MWs needed for ACE correction. These allocated MWs will now be known as "Movement MWs." Changes in the deployment of resources within AGC are necessary.

- Regulation Movement will be allocated as follows:
  - *Allocate Movement MWs to all units proportionally, based on the amount of Regulation Movement MWs they are able to provide in the next six seconds using their six-second response rate, their current physical limitations, and security constraints.*
  - *Today, movement is allocated first to Limited Energy Storage Resources (LESRs), and then to units proportionally based on their RTD Regulation Capacity Schedule.*
    - AGC will continue to manage around the current state of charge for LESRs.
  - *For settlement purposes, Movement MWs for an interval will be the summation of the absolute up and down Movement MWs directed by AGC.*
  - *An AGC signal directed to a Resource for Energy will not be counted as a Movement MW for settlement purposes.*

Movement - continued

- Regulation Performance Index ("PI") – NYISO already measures the accuracy of regulating resources via the Regulation Performance Index, as further described in the Billing and Accounting Manual. NYISO is not proposing to change the way the PI is calculated.
  - *In order to comply with the FERC order's requirement of applying a standard measurement of accuracy to all resources, NYISO must change the current practice of automatically assigning a Regulation Performance Index = 1 for Limited Energy Storage Resources.*

- NYISO proposes to use the PI in RT settlements for regulation movement:

  RT Regulation Movement settlement = Total Regulation Movement MW * RT Regulation Movement Market Price * Regulation Performance Index

Movement - continued

- In addition, NYISO proposes a Regulation Performance Charge:
  - *For regulating providers selected for capacity by RTD, but not responding (or responding poorly) to AGC 6-second signals, there will be a charge applied.*
  - *The charge will be based on the RTD Regulation Capacity MWs which were not actually provided, plus 10%. The calculation will use the higher of the RT Regulation Capacity Market Price or the DAM Regulation Capacity Market Price.*
    - The purpose of the 10% adder is to prevent the no-risk option of being scheduled Day-Ahead and in real time for Regulation Capacity and not performing when instructed.

$$\text{Regulation Performance Charge} = \Big(\big((\text{RTD Regulation Capacity Schedule} * \text{Reg Perf Index}) - \text{RTD Regulation Capacity Schedule}\big) * 1.1\Big) * \text{Max}\big(\text{DAM Regulation Capacity Market Price}, \text{RT Regulation Capacity Market Price}\big)$$

- Example

  Unit A with a 10MW RTD Regulation Capacity Schedule, a 0.6 Reg Performance Index, and a DAM Regulation Capacity Market Price = $7

  - Regulation Performance Charge = (((10MW * 0.6) – 10MW)) * 1.1) * $7
  - Regulation Performance Charge = -4MW * 1.1 * $7
  - Regulation Performance Charge = $30.80

Movement Example

- Assumes 104 mws of movement, prorated across the three resources based on 6 second capability.

Regulation Movement MWs

Provider	$RegMW_{Movement}$	Response Rate
A	34.67mw	1.2mws per 6s
B	57.77mw	2.0mws per 6s
D	11.56mw	0.4mws per 6s

Settlement for regulation movement in one RT interval

Provider	$RegMW_{Movement}$	Reg Perf Index	RTD $RegPrice_{Movement}$	Movement Payment
A	34.67	1.0	$0.80	$27.74
B	57.77	0.8	$0.80	$36.97
D	11.56	0.2	$0.80	$1.85

Setting the Regulation Movement Settlement Price during shortages

- When the Regulation demand curve is triggered, by definition there is no marginal unit since the demand curve itself is marginal.

- Under these conditions, the Regulation Movement Market Price will be set based on the Regulation Movement bid price of the last unit awarded a Regulation Capacity schedule prior to the Regulation demand curve being triggered.
  - *The shadow price of the demand curve will set the Regulation Capacity Market Price*

- The last unit awarded a Regulation Capacity schedule is the unit with the highest Regulation Service composite bid price (for DAM) and the unit with the highest Regulation Movement bid price in RT.
  - *This is essentially the same method of deriving the Regulation Movement Market Price from the Marginal Unit, as we are proposing in non-shortage scenarios.*

Movement – historical examples

- Determining the precise amount of Regulation Movement MWs instructed by AGC solely for ACE correction is not possible with the current data available. However, we manually reverse-engineered the data in six different hours to estimate the amount of Regulation Movement MWs instructed by AGC for ACE correction across all regulating units during those hours:

- *Monday, January 23 2012, HB06*
  - Regulation Capacity for the hour = 275MWh
  - Average of RTD Regulation Capacity Prices = $7.25
  - Estimated Movement MWs during hour = 2,280mws
- *Friday, December 9 2011, HB08*
  - Regulation Capacity for the hour = 275MWh
  - Average of RTD Regulation Capacity Prices = $20.00
  - Estimated Movement MWs during hour = 1,250mws
- *Tuesday, November 22 2011, HB07*
  - Regulation Capacity for the hour = 275MWh
  - Average of RTD Regulation Capacity Prices = $6.00
  - Estimated Movement MWs during hour = 2,164mws
- *Saturday, August 13 2011, HB03*
  - Regulation Capacity for the hour = 175MWh
  - Average of RTD Regulation Capacity Prices = $5.75
  - Estimated Movement MWs during hour = 3,310mws
- *Monday, April 12th, 2010, HB10*
  - Regulation Capacity for the hour = 200MWh
  - Average of RTD Regulation Capacity Prices = $32.00
  - Estimated Movement MWs during hour = 1,242mws
- *Thursday, March 18 2010, HB17*
  - Regulation Capacity for the hour = 275MWh
  - Average of RTD Regulation Capacity Prices = $32.00
  - Estimated Movement MWs during hour = 1,368mws

Bid Floors and Bid Caps

- The bid floor for both Regulation Capacity and Regulation Movement will be $0.
- The FERC Order necessitates a re-design of the way in which Regulation Service is procured. Until the market experience with this new design matures, the implementation will include temporary bid caps for the Regulation Movement bid price.
  - *We are not proposing a bid cap on Regulation Capacity bids at this time.*
- To protect against costs increasing exponentially while the market for this new product matures, NYISO will propose to cap Regulation Movement bid prices at an amount that ensures the total annual system cost for Regulation Movement does not exceed the average total system cost for Regulation Capacity over the past three years.
  - *In other words, since the average annual NYCA-wide payout for Regulation Capacity over the past 3 years was ~$40million annually, the bid cap for Regulation Movement bid prices will be set at a level geared to result in a total system cost for Movement that does not exceed $40million.*
  - *NYISO's Market Monitor will review the competitiveness of the regulation market as part of its quarterly and annual market review [duties] to judge the adequacy of the implemented Regulation Movement bid price cap, and if necessary, will recommend any changes.*

Bid Floors and Bid Caps - continued

- How the bid cap will be derived (numbers are **illustrative only**):
  - *$40m average fuel-adjusted annual total payout for regulation over the past three years.*
  - *18 million Movement MWs average per year.*

$40m 18m = $2.22 cap for Regulation Movement bid price per MW moved.

- To derive the final Regulation Movement bid price cap value, NYISO still must refine its estimates of historical regulation movement.
  - *Current estimations would put the bid cap in the $2-3 a MW moved range.*

Mitigation and controls

- As per the order's requirement to submit tariff provisions for market power mitigation measures under the redesigned Regulation market design, NYISO is currently considering appropriate conduct and impact thresholds.
  - *Reference levels will need to be established in Reference Level Software for Regulation Movement bid price and 6-Second Response Rates.*

- Implementation will include temporary bid caps for Regulation Movement bid price until sufficient market history with bidding behavior and regulation movement can be analyzed.

- NYISO's proposal includes combining the two-part bid prices to prevent a high/low bidding game between Capacity and Movement bids.

- NYISO's existing rules preventing suppliers of Accepted DAM Regulation from increasing Regulation bid prices between day-ahead and real-time will be applied to the new Regulation Capacity and Movement bid prices.

Miscellaneous Settlements

- The FERC Order will result in significant differences in the Regulation market from the current market design. Therefore, miscellaneous settlements, besides those directly related to providing Regulation service, require modification.

- Persistent Under-Generation Charges – charge which may be applied to non-regulating resources whose actual performance is below their schedule.
  - *Current formula, eligibility, and exclusions will remain exactly as they are today, with the exception that the Market Price of Regulation used will be the higher of the RT Regulation Capacity Market Price or DAM Regulation Capacity Market Price.*

- Overgeneration Charges – charge which may be applied to wind resources who fail to reduce output when under a Wind Output Limit instruction from the NYISO.
  - *Current formula, eligibility, and exclusions will remain exactly as they are today, with the exception that the Marginal Market Price of Regulation used will be the higher of the RT Regulation Capacity Market Price or DAM Regulation Capacity Market Price.*

Miscellaneous Settlements continued

- Bid Production Cost Guarantee (BPCG) - current BPCG formulas do not fully consider regulation service cost. Changes to the design and pricing of regulation service in response to FERC Order 755 necessitate modifications to existing DAM and RT BPCG formulas.
  - *Current DAM BPCG:*

    Hourly DAM BPCG = Energy Bid Cost + Mingen Cost + Startup Cost
    - Energy Revenue – Net Ancillary Services Revenue (NASR)

    Daily BPCG = Max (∑ Hourly DAM BPCG, 0)

    where NASR = VSS payment + Max (DAM Reg. Service payment – DAM Reg. Bid Cost, 0) + (DAM Reserves payment – DAM Reserves Bid Cost)

    Note: LESRs are currently ineligible for DAM BPCG.

  - *Proposed change to NASR component in DAM BPCG:*
    - NASR = VSS payment + *(DAM Reg. Capacity Service payment – DAM Reg. Capacity Bid Cost)* + (DAM Reserves payments – DAM Reserves Bid Cost)
    - Allow LESRs to be eligible for the NASR component of the formula (other components will remain zero for LESRs).

Miscellaneous Settlements continued

- *Current RT BPCG:*

  Hourly RT BPCG = ∑ ((Increm. Energy Cost + Mingen Cost – Energy Revenue – ($NASR_{TOT}$ - $NASR_{DA}$) – RRAP + RRAC) x int sec/3600) + Startup Cost

  Daily RT BPCG = Max (∑ Hourly RT BPCG, 0)

  where $NASR_{TOT}$ = VSS payment + Max (RT Reg. Service payment – RT Reg. Bid Cost, 0) + (RT Reserves payment – RT Reserves Bid Cost) + VSS LOC

  RT Reg. Service payment is based on a performance index = 1

  Note: LESRs are currently ineligible for RT BPCG.

- *Proposed change to NASR component in RT BPCG :*
  - $NASR_{TOT}$ = VSS payment + *(RT Reg. Capacity Service payment – RT Reg. Capacity Bid Cost + RT Reg. Movement payment - RT Reg. Movement Bid Cost)* + (RT Reserves payments – RT Reserves Bid) + *VSS LOC*
    Reg Movement Payment is based on a performance index = 1

    - Allow LESRs to be eligible for the NASR component of the formula (other components will remain zero for LESRs).

Miscellaneous Settlements continued

- Day-Ahead Margin Assurance Payment (DAMAP) - DAMAP protects Suppliers' Day-Ahead Margins associated with real-time reductions after accounting for any real-time profits associated with offsetting increases in real-time Energy, Regulation Service, or Operating Reserve Schedules
- The existing DAMAP formulas shall be modified to include the real-time profits associated with Regulation Movement.
  - *Current DAMAP:*

    If Real-Time Regulation Service Schedule < DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x (RT Reg. market price – DAM Reg. bid)

    If Real-Time Regulation Service Schedule ≥ DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x Max (0, RT Reg. market price – RT Reg. bid)

  - *Proposed change to DAMAP:*

    If Real-Time Regulation Service Schedule < DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x (RT Reg. market price – DAM Reg. bid)

    + (-1 x RT Movement MWs) x Max (0, RT Reg. movement market price – RT Reg. movement bid)

    If Real-Time Regulation Service Schedule ≥ DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x Max (0, RT Reg. market price – RT Reg. bid)

    + (-1 x RT Movement MWs) x Max (0, RT Reg. movement market price – RT Reg. movement bid)

Miscellaneous Settlements continued

- DAMAP for LESRs - The existing DAMAP formulas shall be modified to include the real-time profits associated with Regulation Movement. No different than non-LESRs.

- Secondly, the formula shall be modified to include the PI in the formula only when the Reg Capacity Market Price in RT is greater than the DAM Reg Capacity bid price and the Regulation Capacity Schedule in RT is less than in the DAM. The NYISO is not including a PI when the price in RT is less than the DAM bid price as such a calculation would actually reward that resource for poor performance by lessening the offsetting profit.

  - *Proposed change to DAMAP for LESRs:*

    If Real-Time Regulation Service Schedule < DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x (RT Reg. market price – DAM Reg. bid) x (RTD PI)**

    + (-1 x RT Movement MWs) x Max (0, RT Reg. movement market price – RT Reg. movement bid)

    If Real-Time Regulation Service Schedule ≥ DAM Regulation Service Schedule:

    (DAM Reg. schedule – RT Reg. schedule) x (RT Reg. market price – DAM Reg. bid)

    + (-1 x RT Movement MWs) x Max (0, RT Reg. movement market price – RT Reg. movement bid)

***Only include RTD PI when RT Reg Capacity Settlement Price is greater than DAM Reg Capacity Bid*