New York ISO
Independent System Operator

Internal Controllable Lines: Proposed Energy Market Tariff Revisions 3

Michael Swider
Senior Market Design Specialist

ICAPWG/MIWG
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Agenda

- **Project Review**
- **New Draft Tariff Revisions**
  - Metering (MST 13)
  - LBMP Calculations (MST 17.1)
  - Bid Restrictions (MST 21)
  - Deviation Charges (partial MST 32)
  - BPCG and DAMAP (partial MST 18 & 25)
- **Reposted Tariff Sections**
  - MST 2.9 and 32
- **Next Steps**

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Project Review

Project Review

- **NYSERDA's Tier 4 REC initiative has driven the prioritization of this project to develop market participation rules for ICL**
- **The 2022 project reached Market Design Concept Proposed (MDCP)**
  - ICL MDCP Presentation
- **The 2023 project milestone is Market Design Complete (MDC)**
  - Today's presentation summarizes additional energy market-related Tariff revisions
  - Additional Tariff sections to be presented at future MIWGs

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Previous Discussions

Date	Working Group	Discussion Points and Links to Materials
February 21, 2023	ICAPWG/MIWG	Internal Controllable Lines: 2023 Kickoff: https://www.nyiso.com/documents/20142/36339783/ICL_MIWG_022123.pdf/3859d78e-68aa-e5fc-3a7a-fba6f1ed552d
June 27, 2023	ICAPWG/MIWG	Internal Controllable Lines: Proposed Energy Market Tariff Revisions https://www.nyiso.com/documents/20142/38423065/7%20ICL_Energy%20MarketTariff%20Revisions_ICAPWG_MIWG_6.27.23.pdf/c97ff397-07d3-7897-99f1-d7817688623a
August 9, 2023	ICAPWG/MWIG	Internal Controllable Lines: Proposed Energy Market Tariff Revisions 2 https://www.nyiso.com/documents/20142/39257338/ICL_Energy%20MarketTariff%20Revisions_ICAPWG_MIWG_8.9.23.pdf/92824fa6-cfdb-52da-71cf-b1828791ece1

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Draft Tariff Revisions

MST Section 13 - Metering

- **New Subsection 13.2.5 – Internal Controllable Lines**
  - An ICL must separately and directly meter Energy injections and withdrawals at the point of interconnection for each of its terminals
- **Edits include small, ministerial changes unrelated to ICL**

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MST Section 17 - LBMP Calculation

- **17.1.1.1 - Determining Incremental System Losses**
  - For ICL references Section 32 of the Tariff
- **17.1.2.1.2.1.4 (RT) and 17.1.2.1.2.2.3 (DA) – Upper and Lower Dispatch Limits**
  - Describes the setting of Upper and Lower limits for Internal Controllable Lines

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MST Section 21 – Bid Restrictions

- **Bids by an Internal Controllable Line are restricted**
  - maximum Bid Price of $1,000/MWh
  - minimum Bid Price of - $1,000/MWh

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Deviation Charges

- **For an ICL, allowable deviation between scheduled and actual energy injection shall be no more than 3% of the ICL's Upper Operating Limit**
  - This is consistent with allowable deviation for generators
  - The Tariff will include language to allow the NYISO to reduce the 3% of UOL tolerance after the operator and the NYISO gain a better understanding of an ICL's ability to achieve a schedule, or if ICL deviations are impacting system reliability
  - When the ICL is dispatched OOM for reliability there will be no deviation charges
- **Because the first ICL will receive out-of-market payment for injections that deliver clean Energy to New York City, the deviation charge formula includes a minimum charge for over-injection of megawatts that approximates the out-of-market payments Clean Path might receive if it elects to deliver energy in excess of its NYISO schedule plus the allowed tolerance**
  - The deviation charge NYISO proposes may not be appropriate for other ICLs that enter service in the future. The NYISO intends to explicitly recognize that the proposed charge was developed based on Clean Path's facts and circumstances in its FERC filing letter, and to allow for the possibility that a different deviation charge may need to be developed for other ICLs
  - The NYISO is willing to consider evidence that the proposed charge is overstated

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Proposed ICL Deviation Charge

Overdelivery Charge:

$$\sum_{i=1}^{N} [Max(AEI_i^{RT} - (RTB_i + DT), 0) \times Max\,(LBMP_{Ii}^{RT} - LBMP_{Wi}^{RT}, \$100) \times (S_i^{RT} \div 3600\,seconds)\,]$$

Underdelivery Charge

$$\sum_{i=1}^{N} \left[Max\left((RTB_i - DT) - AEI_i^{RT}, 0\right) \times Max\,(LBMP_{Ii}^{RT} - LBMP_{Wi}^{RT}, \$0) \times (S_i^{RT} \div 3600\,seconds)\,\right]$$

Where:

N	= Number of intervals in the hour
AEI_i^{RT}	= Actual Energy Injection in RTD interval *i*, expressed in megawatts.
RTB_i	= RTD Real-time Basepoint in interval *i*, expressed in megawatts
DT:	= Deviation Tolerance, expressed in megawatts
s_i^{RT}:	= Length or RTD interval *i*, expressed in seconds.
$LBMP_{Ii}^{RT}$	= Real-time LBMP at the injection bus in interval *i*, expressed in $/MWh
$LBMP_{Wi}^{RT}$	= Real-time LBMP at the withdrawal bus in interval *i*, expressed in $/MWh

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BPCG and DAMAP

- An ICL is required to offer as NYISO-Committed Flexible and will be eligible for Day-Ahead Bid Production Cost Guarantees
- An ICL will be eligible for Real-Time Bid Production Cost Guarantees and Day-Ahead Margin Assurance Payments when dispatched out-of-merit for system or local reliability
- Proposed BPCG and DAMAP formulae are presented in the follow slides

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Day-Ahead BPCG

An ICL that bids a schedule that is committed by the ISO in the Day-Ahead Market shall be eligible to receive a Day-Ahead Bid Production Cost guarantee payment.

Day-Ahead Bid Production Cost guarantee for ICL =

$$Max\left[\sum_{h=1}^{N}\left(\int_{0}^{EI_{Ih}^{DA}} ICLbid_{h}^{DA} - \left(LBMP_{Ih}^{DA}EI_{Ih}^{DA} - LBMP_{Wh}^{DA}EW_{Wh}^{DA}\right)\right), 0\right]$$

Where,

N	= number of hours in the Day-Ahead Market day;
$ICLbid_{h}^{DA}$	= Bid, in $/MWh, to flow power over the ICL for hour h;
$LBMP_{Ih}^{DA}$	= Day-Ahead LBMP, in $/MWh, for hour *h* at the Injection Bus
$LBMP_{Wh}^{DA}$	= Day-Ahead LBMP, in $/MWh, for hour *h* at the Withdrawal Bus
EI_{h}^{DA}	= Energy scheduled at the Injection bus in each hour *h*, expressed in megawatts
EW_{h}^{DA}	= Energy withdrawal scheduled at the Withdrawal Bus in each hour, expressed in megawatts

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Real-Time BPCG (MST 18)

An Internal Controllable Line is eligible for RT BPCG when dispatched out-of-merit for reliability. In those intervals the Real-Time Bid Production Cost Guarantee for an Internal Controllable Line =

$$ICLBPCG = Max\left[\left(\int_{max(EI_i^{DA},0)}^{AEI_i^{RT}} ICLbid_i^{RT} - \left(LBMP_{Ii}^{RT} * (AEI_i^{RT} - EI_h^{DA}) - LBMP_{Wi}^{RT} * (AEW_i^{RT} - EW_h^{DA})\right)\right) * \frac{S_i}{3600}, 0\right]$$

Where,

S_i	= The number of seconds in RTD interval *I*;
$ICLbid_i^{RT}$	= Bid cost submitted by ICL, or when applicable the mitigated Bid cost for ICL, in the RTD for the hour that includes RTD interval i expressed in terms of $/MWh
EI_h^{DA}	= Energy scheduled at the injection bus in the hour that includes RTD interval *i*
AEI_i^{RT}:	= Actual energy, in megawatts, injected in real-time at the injection bus in RTD interval *i*
AEW_i^{RT}:	= Actual energy, in megawatts, withdrawn in RTD interval *i*.
$LBMP_{Ii}^{RT}$:	= Real time LBMP at the injection bus in interval *i*, expressed in $/MWh
$LBMP_{Wi}^{RT}$	= Real time LBMP at the withdrawal bus in interval i, expressed in $/MWh

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DAMAP (MST 25)

$$DMAP_h = max\left(0, \sum_{i \in h} CDMAPen_i\right)$$

If the Internal Controllable Line's real-time Energy schedule is lower than its Day-Ahead Energy schedule, then:

$$CDMAPen_i = \left((DASI_h - AEI_i) * LBMP_{Ii}^{RT} - (DASW_i - AEW_i) * LBMP_{Wi}^{RT} - \int_{AEI_{iu}}^{DASI_h} ICLbid_i^{DA}\right) * \frac{s_i}{3600}$$

If the Internal Controllable Line's real-time Energy schedule is greater than or equal to its Day-Ahead Energy schedule, then:

$$CDMAPen_i = max\left[\left((DASI_h - AEI_i) * LBMP_{Ii}^{RT} - (DASW_i - AEW_i) * LBMP_{Wi}^{RT} + \int_{DASI_h}^{AEI_i} ICLbid_i^{DA}\right) * \frac{s_i}{3600}, 0\right]$$

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DAMAP, continued

The terms used in the formula for ICL DAMAP shall be defined as follows, with *h* as the hour that includes interval *i:*

$CDMAPen_i$	= the contribution of RTD interval i to the Day-Ahead Margin Assurance Payment;
s_i	= the number of seconds in RTD interval *i*;
$DASW_h$	= the Day-Ahead Energy scheduled for withdrawal in hour h;
$DASI_h$	= the Day-Ahead Energy schedule for injection in hour h;
$ICLbid_i^{DA}$	= Day-Ahead Bid cost submitted by ICL, or when applicable the mitigated Bid cost for ICL, in hour that includes RTD interval *i* expressed in terms of $/MWh
$ICLbid_i^{RT}$	= Real-Time Bid cost submitted by ICL, or when applicable the mitigated Bid cost for ICL, in the RTD in the hour that includes RTD interval i expressed in terms of $/MWh
AIE_i:	= Average actual energy, in megawatts, injected in real-time at the injection bus in RTD interval *i*
AEW_i:	= Average actual energy, in megawatts, withdrawn in RTD interval *i*
$LBMP_{Ii}^{RT}$:	= Real time LBMP at the injection bus in interval *i*, expressed in $/MWh
$LBMP_{Wi}^{RT}$:	= Real time LBMP at the withdrawal bus in interval *i*, expressed in $/MWh

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Reposted Sections

Revisions to Previously Posted Sections

- The sections 2.9 and 32 have been updated in response to stakeholder comments since they were reviewed as part of the 8.9.23 ICAPWG/MIWG materials

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Next Steps

Next Steps

- **Return to future ICAPWG/MIWG meeting to continue discussions with stakeholders, including:**
  - Completed Tariff Sections, including MST 18, 25 & 32
  - Mitigation Tariff
- **Q4 Market Design Complete**

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Our Mission & Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

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