

# Availability and Performance Incentives Structure

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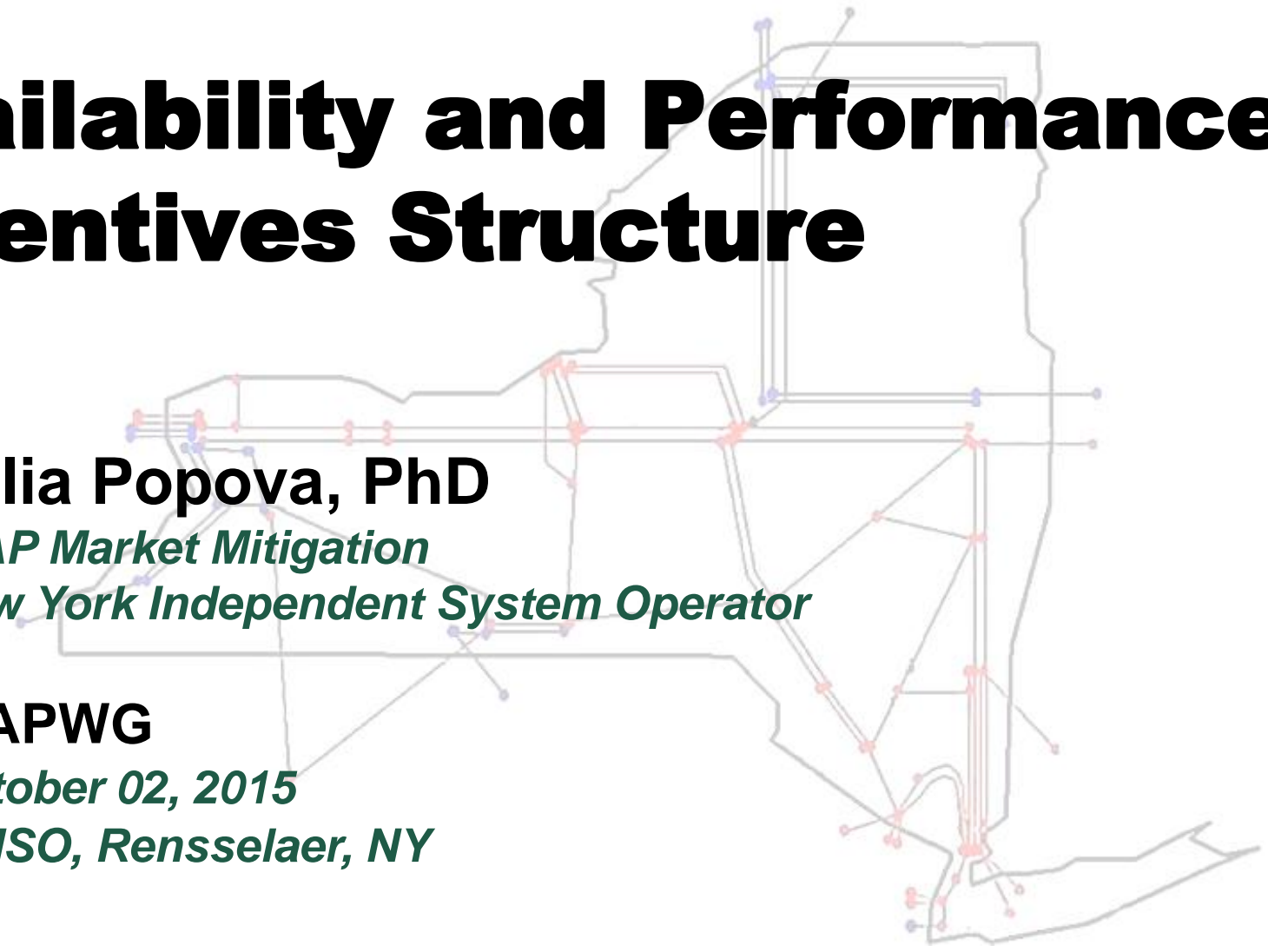
*ICAP Market Mitigation*

*New York Independent System Operator*

**ICAPWG**

*October 02, 2015*

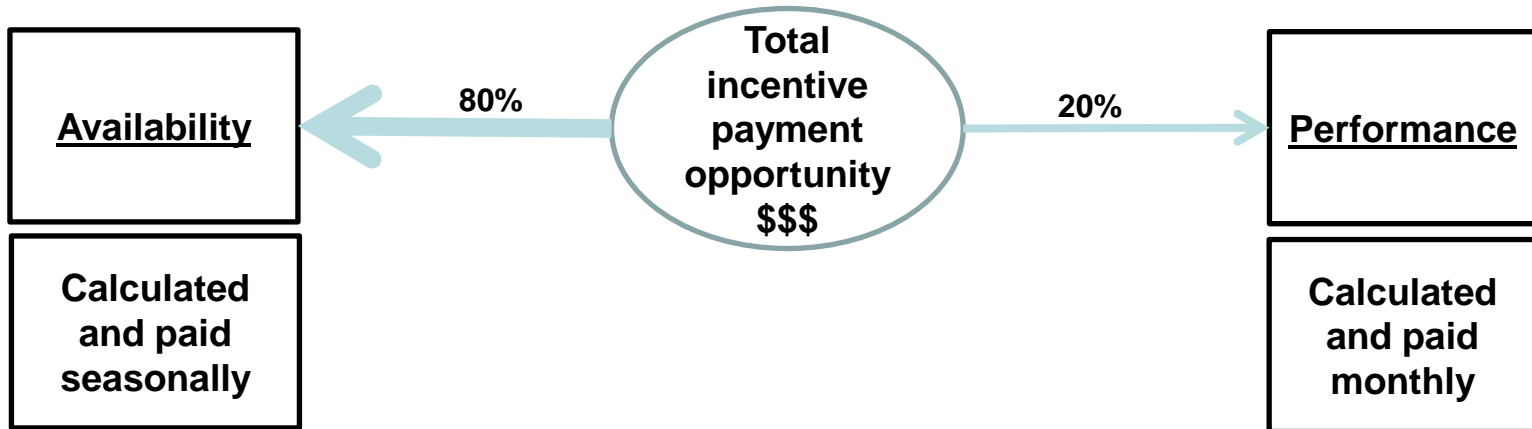
*NYISO, Rensselaer, NY*



# Agenda

- ◆ **Incentives Payments Structure**
- ◆ **Numerical Example**
- ◆ **Minimum Availability and Performance Levels**

# Incentive Payments Structure (1)



- ***Equivalent Availability Factor (EAF)***
- **NERC defines EAF as a measure of fraction of net maximum generation that could be provided after all types of outages and derates are taken into account. It also measures percentage of maximum generation available over time.**

- **Performance will be measured by fraction of generation that followed the dispatch base-point over time**
- **Measure of how well a unit follows its dispatch and therefore produces above the Limit for under-Generation**
- **Based on “Penalty Limit for Under-Generation” as defined in Accounting and Billing Manual Section 1.7**
- **MST 25.4 and 15.3a**

# Incentive Payments Structure (2)

- ◆ Previous presentation (see ICAPWG 08/10/15) had the incentive payments pegged to the 10% of the (Fixed O&M + Capital Expenditures)
  - *Both the Fixed O&M and CapEx pre-approved values/estimates will be in the pro-forma RMR Agreement*
- ◆ NYISO now proposes to set incentive payments based on the Fixed O&M costs in the RMR Generator's APR, excluding CapEx
  - *The RMR Gen will not receive market revenues. The incentives will provide an opportunity for the RMR Unit to make improvements to the unit, via incremental spending*
- ◆ The revised proposal reduces incentives to overbuild Capital Expenditures at RMR Generators

# Incentive Payments Structure (3)

- ◆ Review of current competitive industry rates of return for generators in ISO and RTO markets demonstrates a range between 10% and 15%
  - *NYISO proposes application of 12.5% as first input into determination*
- ◆ Review of public data from similar existing contracts suggested that Fixed O&M is, on average, 50% of a generator's avoidable costs
- ◆ Because Fixed O&M is only half of avoidable costs, the ISO proposes to use 25% of the Fixed O&M costs in the pro-forma to determine the maximum possible incentive
  - *12.5%\*2 = 25%*

# Incentive Payments Structure (4)

- ◆ Both Availability and Performance metrics based on:
  - *“Baseline” is a level RMR unit has demonstrated and can consistently achieve, to be developed using*
    - (1) availability or performance history of the unit based on GADS and CMS data
    - (2) reliability need and potential improvements due to proposed Capital Expenditures
    - (3) other relevant operational restrictions (e.g. emission hours, 69KV voltage control)
  - *“Baseline” may be modified as RMR term progresses*
    - The Availability and Performance baselines set in the RMR Agreement may be modified over the term of the Agreement if substantial change in one of (1) – (3) described above occurs and NYISO and the RMR Gen agree to the change
  - *“Bandwidth” is the range around the Baseline*
    - If the calculated metric falls within the Bandwidth, 50% of the relevant incentive payment will be awarded
  - *“Target”*
    - Is achieved by exceeding the upper end of the Bandwidth
    - Exceeding the upper end of the Bandwidth will result in an additional 30% of incentive payment
  - *“Superior”*
    - Is achieved by exceeding the Target Limit
    - Meeting or exceeding the Target Limit will result in additional 20% of incentive payment
- ◆ No incentive payment is earned if measured Availability or Performance falls below the Lower Bound of the Bandwidth

- ◆ **Lower Bound of Bandwidth:**
  - *10% decrease in the Baseline, if Baseline is below 50%*
  - *5 percent points decrease from the Baseline, if Baseline is above 50%*
- ◆ **Upper Bound of Bandwidth:**
  - *Baseline plus the greater of
    - (i) 5 percent points or
    - (ii) 10% reduction in (1 - Baseline)as long as it is greater than 1/3 of (1-Baseline)*
- ◆ **Target:**
  - *Above Bandwidth but below Target Limit.*
  - *The Target Limit is the upper bound of “Target” performance*
  - *Target Limit is Baseline plus the greater of
    - (i) 10 percent points or
    - (ii) 20% reduction in (1 - Baseline)as long as it is greater than 2/3 of (1 – Baseline)*
- ◆ **Superior:**
  - *Greater or equal to the Target Limit*

# Incentive Payments Structure (6) NEW YORK INDEPENDENT SYSTEM OPERATOR

(calculations are provided in the appendix)

## ◆ **Baseline of 35%**

- *Lower Bound of Bandwidth* 31.5%
- *Upper Bound of Bandwidth* 41.5%
- *Target Limit* 48%
- *Superior* above 48%

## ◆ **Baseline of 75%**

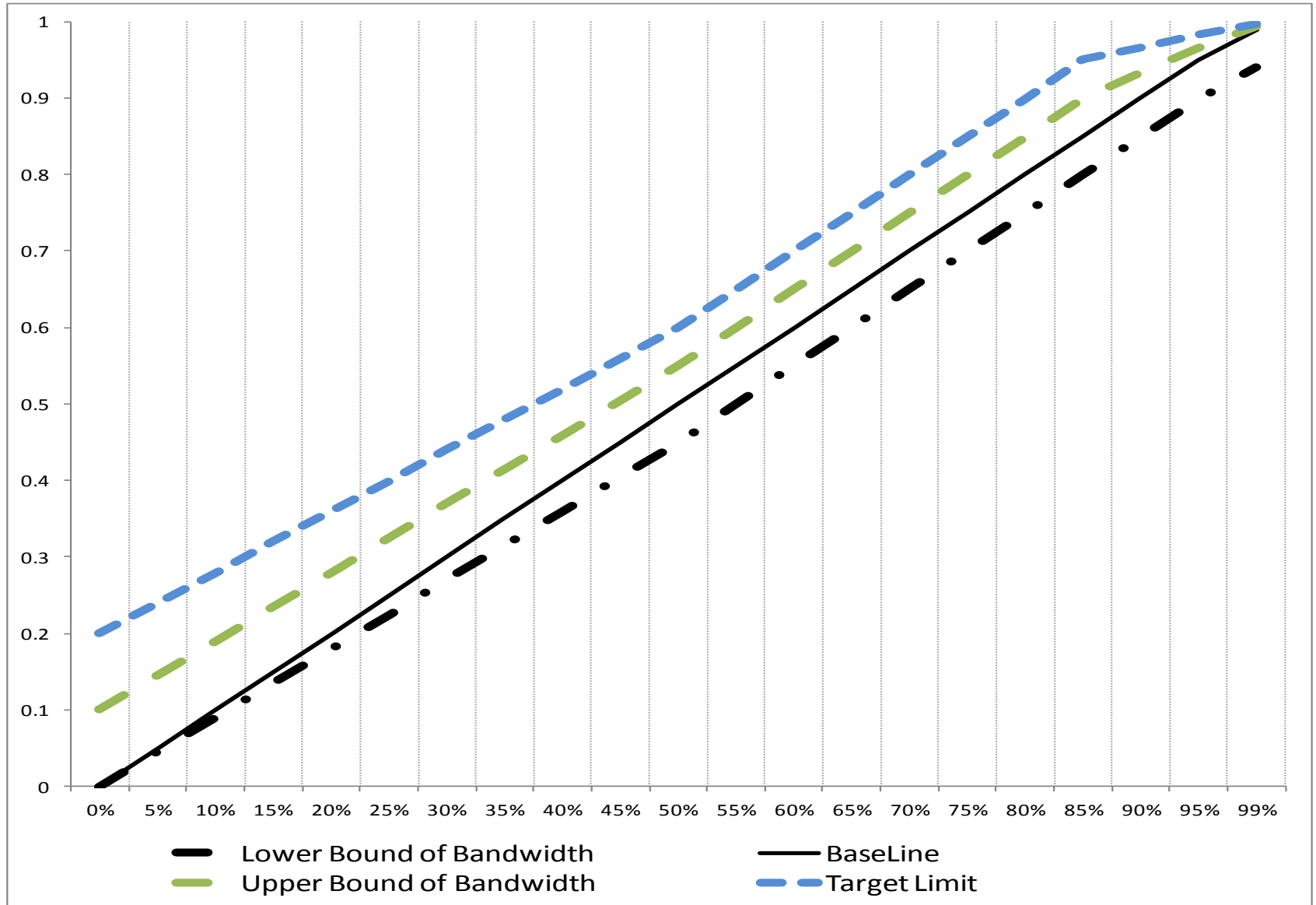
- *Lower Bound of Bandwidth* 70%
- *Upper Bound of Bandwidth* 80%
- *Target Limit* 85%
- *Superior* above 85%

## ◆ **Baseline of 97%**

- *Lower Bound of Bandwidth* 92%
- *Upper Bound of Bandwidth* 98%
- *Target Limit* 99%
- *Superior* above 99%



# Incentive Payments Structure (7)



## ◆ 08/10/15 ICAPWG Numerical Example

### ■ *Fixed O&M ~13.8MM*

- Note: CapEx of \$20.9MM is not included

### ■ *Maximum Possible Incentive Payment is \$3.45MM*

- Availability (80%) – \$2,760,000
- Performance (20%) – \$690,000

### ■ *EAF Baseline is 80%*

- Objective to minimize un-availability
- If within [75% ; 85%) \$1,380,000
- If within [85% ; 90%) +\$828,000
- If above 90% +\$552,000

### ■ *Performance Baseline is 95%*

- Objective is to minimize under-generation
- If within [90.00% ; 96.67%) \$345,000
- If within [95.67 % ; 98.33%) +\$207,000
- If above 98.33 % +\$138,000

# Minimum Availability Level

- ◆ The ISO may terminate the RMR Agreement “for cause” if the Minimum Availability Level is not achieved
  - *The ISO will cease paying for CapEx if an RMR Agreement is terminated for cause*
- ◆ Advisory EAF level will be calculated every month for all past months of the current season
  - *If advisory EAF falls below 85% of established Baseline, RMR Gen may be issued a warning*
    - Example: Issued in March, advisory EAF level will cover November thru February
  - *If the actual EAF for the entire season falls below 80% of established Baseline, NYISO may terminate the RMR Agreement “for cause” and cease reimbursing the former RMR Generator for CapEx*

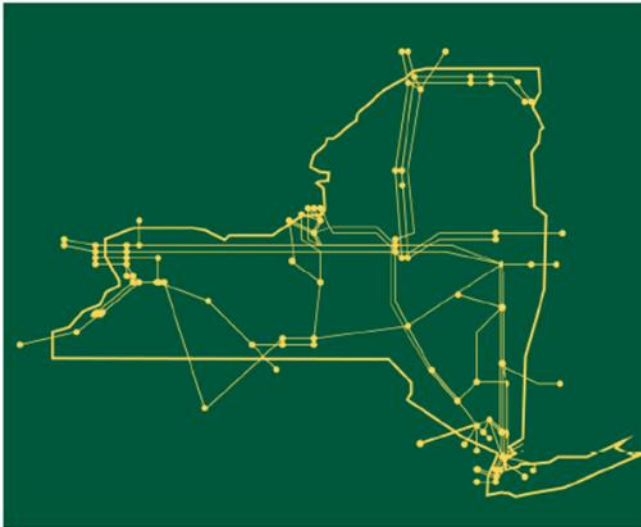
# Minimum Performance Level

- ◆ **Performance levels will be calculated monthly**
  - *If previous month's Performance level fell below 90% of established Baseline, RMR Gen may be issued a warning*
  - *If previous month's Performance level fell below 85% of established Baseline, NYISO may terminate the RMR Agreement "for cause" and cease reimbursing the former RMR Generator for CapEx*

# Questions

- ◆ Questions? Comments?
- ◆ The NYISO will consider input received during today's meeting while preparing the tariff provisions and *pro forma RMR agreement*
- ◆ Stakeholders can also provide additional comments in writing to [deckels@nyiso.com](mailto:deckels@nyiso.com)
  - *Comments should indicate whether or not the stakeholder is requesting that they be posted with the meeting materials*

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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# Appendix: Equivalent Availability Factor

$$[(AH - (EUDH + EPDH + ESEDH))/PH] \times 100 (\%)$$

- ◆ **Available Hours (AH)**
  - *Sum of all Service Hours (SH), Reserve Shutdown Hours (RSH), Pumping Hours, and Synchronous Condensing Hours, or;*
  - *Period Hours (PH) less Planned Outage Hours (POH), Forced Outage Hours (FOH), and Maintenance Outage Hours (MOH).*
- ◆ **Period Hours (PH)**
  - *Number of hours a unit was in the active state. A unit generally enters the active state on its service date.*
- ◆ **Equivalent Unplanned Derated Hours (EUDH):**
  - *The product of Unplanned Derated Hours (UDH) and Size of Reduction, divided by Net Maximum Capacity (NMC).*
- ◆ **Equivalent Planned Derated Hours (EPDH):**
  - *The product of Planned Derated Hours (PDH) and Size of Reduction, divided by Net Maximum Capacity (NMC).*
- ◆ **Equivalent Seasonal Derated Hours (ESEDH):**
  - *Net Maximum Capacity (NMC) less Net Dependable Capacity (NDC), multiplied by Available Hours (AH) and divided by Net Maximum Capacity (NMC).*

# Appendix: Bandwidth and Target Limit

*Lower Bound of Bandwidth =*

$$= \begin{cases} 0.9 * \text{Baseline}\%, & \text{if } \text{Baseline} < 50\% \\ \text{Baseline}\% - 5\%, & \text{if } \text{Baseline} \geq 50\% \end{cases}$$


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*Upper Bound of Bandwidth =*

$$= \text{Baseline}\% + \min \left[ \frac{1}{3} * (100\% - \text{Baseline}\%), \max\{5\%, 0.1 * (100\% - \text{Baseline}\%)\} \right]$$


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*Target Limit =*

$$= \text{Baseline}\% + \min \left[ \frac{2}{3} * (100\% - \text{Baseline}\%), \max\{10\%, 0.2 * (100\% - \text{Baseline}\%)\} \right]$$



# Appendix: Calculation of Incentive Payments Structure



## ◆ Baseline of 35%

- *Lower Bound of Bandwidth*
- *Upper Bound of Bandwidth*
- *Target Limit*
- *Superior*

$$31.5\% = 35\% - 0.1 * 35\%$$

$$41.5\% = 35\% + 0.1 * (100\% - 35\%)$$

$$48\% = 35\% + 0.2 * (100\% - 35\%)$$

above 48%

## ◆ Baseline of 75%

- *Lower Bound of Bandwidth*
- *Upper Bound of Bandwidth*
- *Target Limit*
- *Superior*

$$70\% = 75\% - 5\%$$

$$80\% = 75\% + 5\% = \min(25\%/3, \max(5\%, 0.1 * 25\%))$$

$$85\% = 75\% + 10\% = \min(2 * 25\%/3, \max(10\%, 0.2 * 25\%))$$

above 85%

## ◆ Baseline of 97%

- *Lower Bound of Bandwidth*
- *Upper Bound of Bandwidth*
- *Target Limit*
- *Superior*

$$92\% = 97\% - 5\%$$

$$98\% = 97\% + (100\% - 97\%)/3$$

$$99\% = 97\% + 2 * (100\% - 97\%)/3$$

above 99%

# Appendix: Performance Factor (1)

$$\text{Performance \%} = 100\% - \frac{\sum_{t=1}^T \max(PLU_t^{RT} - \text{Production}_t^{RT}, 0)}{\sum_{i=1}^T PLU_i^{RT}}$$

**Production<sub>t</sub><sup>RT</sup>**      Real-Time output of Generator over RDT interval t, in MW

**PLU<sub>t</sub><sup>RT</sup>**              Penalty Limit for Under-Generation or Generator over RDT interval t, in MW

# Appendix: Performance Factor (2): Billing and Accounting Manual, Section 1.7

## *Under Generation Penalty Settlement*

$$\sum_{i=1}^N \{ [\max(\{PLU_{gi}^{RT} - EI_{gi}^{RT}\}, 0) \times REGMCP_{gi}^{RT}] \times (s_i^{RT} \div 3600 \text{ seconds}) \}$$

*Where:*

$N$ : Number of RTD intervals in the hour;

$s_i^{RT}$ : Length of RTD interval  $i$ , expressed in seconds;

$PLU_{gi}^{RT}$ : Penalty Limit for Under Generation for Generator  $g$  over RTD interval  $i$ , expressed in MW calculated as follows:

$$PLU_{gi}^{RT} = \max[\min(\{AGC_{gi}^{RT} - CET_{gi}^{RT}\}, \{[900 \times PLU_{g(i-1)}^{RT}] + [s_i^{RT} \times (AGC_{gi}^{RT} - CET_{gi}^{RT})]\}) \div \{900 + s_i^{RT}\}, 0]$$

*Where:*

$CET_{gi}^{RT}$ : 3 % of the Upper Operating Limit of Generator  $g$  for RTD interval  $i$ , expressed in terms of MW;

$AGC_{gi}^{RT}$ : Average desired generation level (i.e., AGC basepoint) issued to Generator  $g$  over RTD interval  $i$ , expressed in terms of MW;

$PLU_{g(i-1)}^{RT}$ : Penalty Limit for Under-Generation for Generator  $g$  for RTD interval  $i-1$ , or 0 if Generator  $g$  has not been running in the last 4 hours

$EI_{gi}^{RT}$ : Real-Time output of Generator  $g$  over RTD interval  $i$ , expressed in MW;

$REGMCP_{gi}^{RT}$ : The greater of the Day-Ahead Regulation Capacity Market Price or the Real-Time Regulation Capacity Market Price for RTD interval  $i$ , expressed in terms of \$/MW;