Attachment J:

Unforced Capacity for Installed Capacity Suppliers

1.0 Fundamental Formulae

(1-1) $\text{UCAP} = (1 - \text{EFOR}_D) \times \text{DMNC}$

(1-2) $\text{EFOR}_D = \dfrac{f_f \times \text{FOH} + f_p \times (\text{EFOH} - \text{FOH})}{\text{SH} + f_f \times \text{FOH}}$

(1-3) $f_f = \dfrac{\dfrac{1}{r} + \dfrac{1}{T}}{\dfrac{1}{r} + \dfrac{1}{T} + \dfrac{1}{D}}$

(1-3a) $r = \text{average forced outage duration} = \dfrac{\text{FOH}}{\text{number of forced outages}}$

(1-3b) $T = \text{average time between calls for a unit to run} = \dfrac{\text{RSH}}{\text{number of attempted starts}}$

(1-3c) $D = \text{average run time} = \dfrac{\text{SH}}{\text{number of successful starts}}$

(1-4) $f_p = \dfrac{\text{SH}}{\text{AH}}$

> **Note: UCAP values will be calculated monthly for each Resource based on a rolling 12-month calculation. The detailed formulae, including treatment where new units are being phased in, are shown in Section 3.**

2.0 Definitions

UCAP .... Unforced Capacity

EFORd .... Equivalent Demand Forced Outage Rate

DMNC .... per Tariff definition

ICE .... Installed Capacity Equivalent as defined in the Services Tariff and in Section 3 of this Attachment J.

Net Dependable Capacity .... The gross power level that a unit can sustain during any period of time when there are no equipment, operating or regulatory restrictions and after adjusting for station service and auxiliary loads and ambient conditions. Average ambient temperature should reflect the average of the daily high temperatures for the month at the plant location. Only one Net Dependable Capacity for each Resource shall be reported for each month. That value may be either the Resource's DMNC for the Capability Period containing that month or that Resource's average Net Dependable Capacity for that month, at the discretion of the owner of the Resource.

f_f .... full f-factor (see formula in Section 1.0)

f_p .... partial f-factor (see formula in Section 1.0)

FOH .... Full Forced Outage Hours

Forced Outage .... An unplanned failure that requires a unit to be removed from service, or the Load on the unit to be reduced before the end of the nearest following Weekend.

EFOH .... Equivalent Full Forced Outage Hours: Sum of all hours a unit was involved in an outage expressed as equivalent hours of full forced outage at its maximum net dependable capability.

SH .... Service Hours: The time a unit is electrically connected to the system - Sum of all Unit Service Hours.

AH .... Available Hours: The time a unit is capable of producing energy, regardless of its capacity level -- Sum of all Service Hours + Reserve Shutdown Hours + Pumping Hours + Synchronous Condensing Hours.

RSH.......................................Reserve Shutdown Hours: The time a unit is available for service but not dispatched due to economic or other reasons.

PH ....Period hours equals 24 times the number of days in the reporting period.

Note: For in-depth GADS Data concepts, refer to the NERC Fast Link for GADS Services at www.nerc.com.

3.0   Calculations

In general, all generating Resources with nameplate capacities greater than 10 MWs or plants with aggregated capacities greater than 25 MW are expected to provide the full GADS Data set defined in Attachment K. Except as noted below, the amount of UCAP that a Resource will qualify to supply if the full GADS Data set is provided for it will be calculated using the equations in Section 3.1, as will be the Installed Capacity Equivalent of such Resources; and the amount of UCAP that can be supplied by Resources for which equivalent GADS Data are provided in lieu of the full GADS data set, as well as the Installed Capacity Equivalent for those generators, will be calculated as described in Section 3.2. The amount of UCAP that Special Case Resources qualify to supply and the ICAP Equivalent for these Resources will be determined according to Section 3.3; the amount of UCAP that Control Area System Resources qualify to supply and the ICAP Equivalent for these Resources will be determined according to Section 3.4; amount of UCAP that Intermittent Power Resources qualify to supply will be calculated according to Section 3.5; and the amount of UCAP that Resources using UDRs qualify to supply will be determined according to Section 3.6.

3.1   UCAP based on EFOR$_D$

This section applies to Resources that submit GADS Data using the GADS reporting format in Attachment K. Energy Limited Resources that do not want to have their UCAP based on production levels using equivalent GADS Data, using the equations in Section 3.2, will have to submit GADS Data to document their available capacity for the minimum 4-hour daily requirement period.

(a)   **Determining the Amount of UCAP a Resource Qualifies to Supply**

$UCAP^Q_{gm} = (1\text{-}QEFORd_{gm})\ DMNC_{gm};$

where:

$UCAP^Q_{gm}$ is the amount of Unforced Capacity that Resource g is qualified to provide in month m;

$AEFORd_{gm}$ is the Average Equivalent Demand Forced Outage Rate calculated for Resource g that will be used to determine the amount of Unforced Capacity that

the Resource will be permitted to provide in month m, as defined further below; and

DMNC$_{gm}$ is the DMNC rating for Resource *g* which is applicable for month *m*, which shall be the most recent Summer DMNC rating for that Resource calculated in accordance with ISO procedures if month *m* is part of a Summer Capability Period, or the most recent Winter DMNC rating for the Resource calculated in accordance with ISO procedures if month *m* is part of a Winter Capability Period, as of the close of business on the last business day preceding the Monthly Installed Capacity Auction that is conducted during the month preceding month *m*.

If month *m* is in the Winter Capability Period, then *AEFORd$_{gm}$*, will be equal to the average of the EFORd values calculated for Resource *g* for the 12-month periods ending with the February, March, April, May, June and July that precede month *m*. If month *m* is in the Summer Capability Period, *AEFORd$_{gm}$*, will be equal to the average of the EFORd values calculated for Resource *g* for the 12-month periods ending with the August, September, October, November, December and January that precede month *m*. *EFORd$_{gn}$*, the EFORd value for Resource *g* for the 12-month period ending in any given month *n* that is used in the calculation of *AEFORd$_{gm}$*, will be calculated as follows:

$$
\mathrm{EFORd}_{gn} = \frac{\mathrm{IST}_{ge}}{12} \times \frac{f_{fgbe}\mathrm{FOH}_{gbe} + f_{pgbe}(\mathrm{EFOH}_{gbe} - \mathrm{FOH}_{gbe})}{(\mathrm{SH}_{gbe} + f_{fgbe}\mathrm{FOH}_{gbe})} + \left(1 - \frac{\mathrm{IST}_{ge}}{12}\right)\mathrm{CEFOR}_{Dg}
$$

where f$_{fgbe}$ and f$_{pgbe}$ are further defined below and:

IST$_{ge}$ is the number of months that Resource *g* was in service during the 12-month period ending as of time *e* (*IST$_{ge}$* = 0 if generator *g* had not entered service as of time *e*, and *IST$_{ge}$* = 12 if Resource *g* was in service from months *m* – 14 through month *m* – 3);

FOH$_{gbe}$ is the sum of all Full Forced Outage Hours reported for Resource *g* for the period beginning at time *b* and ending at time *e*. The data is the GADS Data submitted in accordance with Attachment K, Performance Record 02, columns 40-43 and Event Record 01, NERC Event Types U1, U2, U3, and SF;

EFOH$_{gbe}$ is the sum of all Equivalent Full Forced Outage Hours reported for Resource *g* for the period beginning at time *b* and ending at time *e*. The data is the GADS Data submitted in accordance with Attachment K for NERC Event Types U1, U2, U3, D1, D2, D3 and SF, such that:

$$
\text{EFOH}_{gbe} = \begin{cases} 0, \text{ if there were no outages for Resource g during the} \\ \text{period beginning at time b and ending at time e; and} \\ \sum_{i \in \text{OUT}_{gbe}} \frac{(\text{NDC}_{gi} - \text{NAC}_{gi})\text{H}_{gi}}{\text{NDC}_{gi}}, \text{ otherwise;} \end{cases}
$$

where:

OUT_{gbe} is the set of outages for Resource g during the period beginning at time b and ending at time e:

NDC_{gi} is the Net Dependable Capacity for Resource g applicable for outage i, submitted in accordance with Attachment K, Performance Record 01, columns 35-38;

NAC_{gi} is the Net Available Capacity for Resource g, applicable for outage i, submitted in accordance with Attachment K, Event Record 01, columns 60-63;

and

H_{gi} is the time accumulated for Resource g applicable for outage i submitted in accordance with Attachment K, columns 20-27 and columns 48-55, (*i.e.*, the positive difference between the start and end of the event).

SH_{gbe} is the sum of all Service Hours reported for Resource g for the period beginning at time b and ending at time e in accordance with the GADS Data submitted in accordance with Attachment K, Performance Record 02, columns 16-19;

e is the end of the month occurring three months before month m, (e.g., if month m is September 2001, then e is the end of June 2001);

b is the beginning of the month occurring 14 months before month m, unless the Resource had not gone into service at that time, in which case b is the time at which that Resource went into service; and

$CEFOR_{Dg}$ is the class-equivalent EFOR$_D$ calculated by the ISO for Resources of the same class as Resource g based on NERC class averages for similar Resources. Where no similar Resource exists, the NYISO will estimate a value based on its best judgment, if a mutually acceptable value cannot be agreed on.

Then:

$$f_{fgbe} = \frac{\dfrac{1}{r} + \dfrac{1}{T}}{\dfrac{1}{r} + \dfrac{1}{T} + \dfrac{1}{D}}$$

where:

r is FOH_{gbe} divided by the total number of GADS Data Forced Outages reported for the period beginning at time b and ending at time e in accordance with Attachment K;

T is the number of Reserve Shutdown Hours (RSH_{gbe}) divided by the number of attempted starts reported for the period beginning at time b and ending at time e for Resource g. RSH_{gbe} is the sum of all Reserve Shutdown Hours reported for Resource g for the period beginning at time b and ending at time e in accordance with the GADS Data submitted in accordance with Attachment K, Performance Record 02, columns 20-23; and

D is the number of Service Hours (SH_{gbe}) divided by the number of successful starts reported for the period beginning at time b and ending at time e for Resource g; and

$$f_{pgbe} = \frac{SH_{gbe}}{AH_{gbe}}$$

where:

AH_{gbe} is the sum of all Available Hours reported for Resource g for the period beginning at time b and ending at time e in accordance with GADS Data submitted under Attachment K, Performance Record 02, Columns 32-35.

These equations shall be modified when necessary as follows in order to avoid dividing by zero:

If $RSH = 0$ (<1), set $f_f = 1$;

If $SH = 0$, set $f_f = 1$;

If $FOH = 0$, set $1/r = 0$ and calculate f_f per its equation; and

If $AH = 0$, set $f_p = 1$.

(b)   Determining the ICE of the Amount of UCAP Supplied

$$ICE_{gm} = \frac{UCAP^P{}_{gm}}{1 - EFORd_{gm}};$$

where:

ICE$_{gm}$ is the Installed Capacity Equivalent of the amount of Unforced Capacity that Resource *g* supplies in month *m*;

UCAP$^P_{gm}$ is the amount of Unforced Capacity that Resource *g* supplies in month *m*; and

EFORd$_{gm}$ as above, is the Equivalent Demand Forced Outage Rate calculated for Resource *g* that will be used to determine the amount of Unforced Capacity that resource will be permitted to provide in month *m*.

3.2 UCAP based on equivalent GADS Data (capacity factor method)

This section applies to Resources that submit equivalent GADS Data using the GADS Data form in Attachment K.

(a) **Determining the Amount of UCAP a Resource Qualifies to Supply**

$$\text{UCAP}^Q{}_{gm} = (1 - \text{OF}_{gm})\text{DMNC}_{gm};$$

where:

UCAP$^Q_{gm}$ is the amount of Unforced Capacity that Resource *g* is qualified to provide in month *m*;

OF$_{gm}$ is the Outage Factor calculated for Resource *g*, as further defined below, that will be used to determine the amount of Unforced Capacity that Resource will be permitted to provide in month *m*; and

DMNC$_{gm}$ is the DMNC rating for Resource *g* which is applicable for month *m*, which shall be the most recent Summer DMNC rating for that Resource calculated in accordance with ISO procedures if month *m* is part of a Summer Capability Period, or the most recent Winter DMNC rating for the Resource calculated in accordance with ISO procedures if month *m* is part of a Winter Capability Period, as of the close of business on the last business day preceding the Monthly Installed Capacity Auction that is conducted during the month preceding month *m*.

OF for month *m* will be based on GADS Data for months m – 14 through month m – 3. (For example, the EFORd for August will be based on data submitted for June of the prior year through May of the current year).

$$\text{OF}_{gm} = \frac{\text{IST}_{ge}}{12} \times (1 - \text{CF}_{gbe}) + \left(1 - \frac{\text{IST}_{ge}}{12}\right)(1 - \text{CCF}_g)$$

<u>where:</u>

OF_{gm} is the Outage Factor for Resource g that will be used to determine the amount of Unforced Capacity that Resource will be permitted to provide in month m;

IST_{ge} is the number of months that Resource g had been in service as of time e (0 if generator g was not in service as of time e; 12 if Resource g was in service from months m-14 through month m-3); and

$$CF_{gbe} = \frac{NAG_{gbe}}{\sum_{m=B}^{E}\left(NDC_{gm}\left(PH_{gm} - POH_{gm} - MOH_{gm}\right)\right)} ;$$

<u>where:</u>

CF_{gbe} is the Capacity Factor for Resource g for the period beginning at time b and ending at time e;

NAG_{gbe} is the Net Actual Generation for Resource g for the period beginning at time b and ending at time e. The data is the GADS Data submitted in accordance with Attachment K, Performance Record 01, columns 39-45;

NDC_{gm} is the Net Dependable Capacity for Resource g for month m. The data is the GADS Data submitted in accordance with Attachment K, Performance Record 01, columns 35-38;

PH_{gm} is the Period Hours reported for Resource g for month m. The data is the GADS Data submitted in accordance with Attachment K, Performance Record 02, columns 56-59;

POH_{gm} is the Planned Outage Hours reported for Resource g for month m. The data is from the GADS Data submitted in accordance with Attachment K, Performance Record 02, columns 36-39;

MOH_{gm} is the Maintenance Outage Hours reported for Resource g for month m. The data is from the GADS Data submitted in accordance with Attachment K, Performance Record 02, columns 44-47;

CCF_g is the class-equivalent Capacity Factor for Resources of the same class as Resource g based on NERC class averages for similar Resources. Where no similar Resource exists, the NYISO will estimate a value based on its best judgment if a mutually acceptable value cannot be agreed on;

b is the beginning of the month occurring 14 months before month m, unless the Resource had not gone into service at that time, in which case b is the time at which that Resource went into service;

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e is the end of the month occurring three months before month *m*, (e.g., if month *m* is September 2001, then *e* is the end of June 2001);

B is the month containing time *b*; and

E is the month containing time *e*.

(b)   Determining the ICE of the Amount of UCAP Supplied

$$ICE_{gm} = \frac{UCAP^P_{gm}}{1 - OF_{gm}}$$

<u>where:</u>

ICE$_{gm}$ is the Installed Capacity Equivalent of the amount of Unforced Capacity that Resource *g* supplies in month *m*;

UCAP$^P_{gm}$ is the amount of Unforced Capacity that Resource *g* supplies in month *m*; and

OF$_{gm}$, as above, is the Outage Factor for Resource *g* that will be used to determine the amount of Unforced Capacity that Resource will be permitted to provide in month *m*.

3.3   UCAP based on Load/Demand Reduction applicable to Special Case Resources

The amount of UCAP that a Special Case Resource qualifies to supply shall be calculated using the equations specified in subsection 3.3(a), with the following exceptions:

- A Special Case Resource that provides capacity solely by means of load reductions achieved through operation of one or more generators may elect to have the amount of UCAP it qualifies to supply calculated using the equations specified in either subsection 3.3(a) or subsection 3.3(b).

- The amount of UCAP that a non-generator- based Special Case Resource qualifies to supply if its APMD is provisionally based on monthly billing demands shall be calculated using the equations specified in subsection 3.3(c).

The Installed Capacity Equivalent for Special Case Resources shall be calculated as specified in subsection 3.3(d). The method for determining RIP deficiencies is specified in Section 3.3(e) and RIP portfolio performance will be determined according to Section 3.3(f). The "SCR Workbook" refers to the Excel Workbook currently posted on the NYISO website at http://www.nyiso.com/public/products/icap/auctions.jsp.

(a)   Determining the Amount of UCAP that a Special Case Resource Qualifies to Supply

$$UCAP^{Q}_{gm} = (APMD_{gm} - CMD_{gm}) \ \times \ \frac{\sum\limits_{h \in LRHgbe}(APMD_{gh} - AMD_{gh})}{\sum\limits_{h \in LRHgbe}(APMD_{gh} - CMD_{gh})} \ \times \ \left(1 + TLF_{g}\right)$$

where:

$UCAP^{Q}_{gm}$ is the amount of Unforced Capacity that Resource g is qualified to provide in month m;

$APMD_{gm}$ is the Average of Peak Monthly Demands between Noon and 8 PM for Resource g applicable to month m, using data submitted in accordance with the SCR Workbook; if month m is in the Summer Capability Period, the Average of Peak Monthly Demands is calculated using the peak monthly demands between 12:00 p.m. and 8:00 p.m. for that Special Case Resource for the months of June, July, August and September in the Summer Capability Period prior to the Capability Period containing month m; and if month m is in the Winter Capability Period, the Average of Peak Monthly Demands is calculated using the peak monthly demands between 12:00 p.m. and 8:00 p.m. for that Special Case Resource for the months of December, January, February and March in the Winter Capability Period prior to the Capability Period containing month m;

CMD_{gm} is the Committed Minimum Demand for Resource g applicable to the calculation of UCAP that Resource g can provide in month m, using data submitted in accordance with the SCR Workbook;

LRH_{gbe} is the set of hours (each an hour h) in the period beginning at time b and ending at time e in which Resource g was requested to reduce load; where

b is the beginning of the Winter Capability Period immediately preceding the Summer Capability Period prior to the Summer Capability Period containing month m, if month m occurs during a Summer Capability Period; and the beginning of the most recent Summer Capability Period immediately preceding the Winter Capability Period prior to the Winter Capability Period containing month m, if month m occurs during a Winter Capability Period;

e is the end of the Summer Capability Period immediately preceding the Summer Capability Period containing month m, if month m occurs during a Summer Capability Period; and the end of the most recent Winter Capability Period immediately preceding the Winter Capability Period containing month m, if month m occurs during a Winter Capability Period;

$APMD_{gh}$ is the applicable Average of Peak Monthly Demands for Resource g applicable to hour h, using data submitted in accordance with the SCR Workbook; if hour h is in the Summer Capability Period, the Average of Peak Monthly Demands is calculated using the peak monthly demands for that supplier for the most recent consecutive months of June, July, August and September that had

occurred as of time e; and if hour h is in the Winter Capability Period, the Average of Peak Monthly Demands is calculated using the peak monthly demands for that supplier for the most recent consecutive months of December, January, February and March that had occurred as of time e;

AMD_{gh} is the Actual Metered Demand for Resource g for hour h, using data submitted in accordance with the SCR Workbook;

CMD_{gh} is the Committed Minimum Demand for Resource g applicable to hour h, using data submitted in accordance with the SCR Workbook; and

TLF_g is the applicable transmission loss factor for Resource g, expressed in decimal form (*i.e.*, a loss factor of 8% is equal to .08). The applicable transmission loss factor shall be the loss factor for deliveries of Energy by the relevant TO to the retail customer where the Resource g is located as reflected in the TO's most recent rate case.

Therefore, in order to calculate $UCAP^Q_{gm}$ for August 2007:

First, note that August 2007 is contained in the Summer 2007 Capability Period, so $APMD_{gm} - CMD_{gm}$ is the difference between (1) the average of the peak monthly demands for Special Case Resource g between 12:00 p.m. and 8:00 p.m. for the months of June, July, August and September 2006 (since those are the months of June, July, August and September in the Summer 2006 Capability Period, which is the Summer Capability Period prior to the Summer 2007 Capability Period, which contains month m), and (2) the Committed Minimum Demand for Special Case Resource g for August 2007.

This difference is then multiplied by $\dfrac{\displaystyle\sum_{h \in LRHgbe}(APMD_{gh} - AMD_{gh})}{\displaystyle\sum_{h \in LRHgbe}(APMD_{gh} - CMD_{gh})}$. Since b is the beginning of the Winter Capability Period immediately preceding the Summer Capability Period prior to the Summer 2007 Capability Period, which contains August 2007, b must be the beginning of the Winter 2005-06 Capability Period. Similarly, since e is the end of the Summer Capability Period immediately preceding the Summer 2007 Capability Period, e must be the end of the Summer 2006 Capability Period. Consequently, the numerator of this fraction measures the difference between the Average of Peak Monthly Demands for June, July, August and September 2006 (since those were the most recent consecutive months of June, July, August and September that had occurred as of the end of the Summer 2006 Capability Period) and the Actual Metered Demand for each hour, summed over the hours in the Winter 2005-06 and Summer 2006 Capability Periods in which Special Case Resource g was requested to reduce load. The denominator of that fraction measures the difference between the Average of Peak Monthly Demands for June, July, August and September 2006 and the Committed Minimum Demand for each hour, summed over the hours in the Winter 2005-06

and Summer 2006 Capability Periods in which Special Case Resource g was requested to reduce load.

Finally, this is multiplied by one plus the transmission loss factor for Resource g.

And in order to calculate $UCAP^Q_{gm}$ for January 2008:

First, note that August 2007 is contained in the Winter 2007-08 Capability Period, so $APMD_{gm} - CMD_{gm}$ is the difference between (1) the average of the peak monthly demands for Special Case Resource g between 12:00 p.m. and 8:00 p.m. for the months of December 2006, and January, February and March 2007 (since those are the months of December, January, February and March in the Winter 2006-07 Capability Period, which is the Winter Capability Period prior to the Winter 2007-08 Capability Period, which contains month m), and (2) the Committed Minimum Demand for Special Case Resource g for January 2008.

This difference is then multiplied by $\dfrac{\sum\limits_{h\in LRHgbe}(APMD_{gh} - AMD_{gh})}{\sum\limits_{h\in LRHgbe}(APMD_{gh} - CMD_{gh})}$. Since b is the beginning of the most recent Summer Capability Period immediately preceding the Winter Capability Period prior to the Winter 2007-08 Capability Period, which contains January 2008, b must be the beginning of the Summer 2006 Capability Period. Similarly, since e is the end of the most recent Winter Capability Period immediately preceding the Winter 2007-08 Capability Period, e must be the end of the Winter 2006-07 Capability Period. Consequently, the numerator of this fraction measures the difference between the Average of Peak Monthly Demands for December 2006 and January, February and March 2007 (since those were the most recent consecutive months of June, July, August and September that had occurred as of the end of the Winter 2006-07 Capability Period) and the Actual Metered Demand for each hour, summed over the hours in the Summer 2006 and Winter 2006-07 Capability Periods in which Special Case Resource g was requested to reduce load. The denominator of that fraction measures the difference between the Average of Peak Monthly Demands for December 2006 and January, February and March 2007 and the Committed Minimum Demand for each hour, summed over the hours in the Summer 2006 and Winter 2006-07 Capability Periods in which Special Case Resource g was requested to reduce load.

Finally, this is multiplied by one plus the transmission loss factor for Resource g.

(b)   Determining the Amount of UCAP that a Generator-Based Special Case Resource Qualifies to Supply

$$UCAP^{Q}_{gm} = DMNC_{gm} \ \ X \ \ \frac{\sum\limits_{h \in LRHgbe} AGO_{gh}}{\sum\limits_{h \in LRHgbe} CGO_{gh}} \ \ X \ \ \left(1 + TLF_g\right)$$

where:

$UCAP^{Q}_{gm}$ is the Unforced Capacity that Resource *g* is qualified to provide in month *m*;

$DMNC_{gm}$ is the total of DMNC ratings for all generators (net of auxiliary power, load bank Load and any base Load generation production that served to modify the Special Case Resource's metered Load during the prior NYCA system peak period) used to reduce load at Resource *g* which are applicable for month *m*, which shall be the most recent Summer DMNC ratings for the generators calculated in accordance with ISO procedures if month *m* is part of a Summer Capability Period, or the most recent Winter DMNC ratings for the generators calculated in accordance with ISO procedures if month *m* is part of a Winter Capability Period, as of the close of business on the last business day preceding the Monthly Installed Capacity Auction that is conducted during the month preceding month *m*.

LRH_{gbe} is the set of hours (each an hour *h*) in the period beginning at time *b* and ending at time *e* in which Resource *g* was requested to reduce load;

AGO_{gh} is the MW-hr output of the generator(s) located at Resource *g* during an hour *h* using data submitted in accordance with the SCR Workbook;

CGO_{gh} is the Committed Generator Output for the generator(s) located at Resource *g* applicable to an hour *h*, using data submitted in accordance with the SCR Workbook;

b is the beginning of the Winter Capability Period immediately preceding the Summer Capability Period prior to the Summer Capability Period containing month *m*, if month *m* occurs during a Summer Capability Period; and the beginning of the most recent Summer Capability Period immediately preceding the Winter Capability Period prior to the Winter Capability Period containing month *m*, if month *m* occurs during a Winter Capability Period;

e is the end of the Summer Capability Period immediately preceding the Summer Capability Period containing month *m,* if month m occurs during a Summer Capability Period; and the end of the most recent Winter Capability Period immediately preceding the Winter Capability Period containing month *m*, if month *m* occurs during a Winter Capability Period ; and

TLF_g is the applicable transmission loss factor for Resource *g,* expressed in decimal form (*i.e.*, a loss factor of 8% is equal to .08). The applicable

transmission loss factor shall be the loss factor for deliveries of Energy by the relevant TO to the retail customer where the Resource g is located as reflected in the TO's most recent rate case.

(c) **Determining the Amount of UCAP that a Non-Generator Based Special Case Resource Qualifies to Supply if Its APMD Is Provisionally Based on Monthly Billing Demands**

This calculation applies only to non-generator-based Special Case Resources with newly installed interval billing meters and will apply for no longer than two successive Capability Periods. The amount of UCAP that such a non-generator-based Special Case Resource qualifies to supply will be calculated as in Section 3.3.(a), except that the applicable Average of Peak Monthly Demands for Resource g applicable to hour h is calculated using the actual peak monthly demands for that Special Case Resource as follows: if hour h is in the Summer Capability Period, the Average of Peak Monthly Demands is calculated using the peak monthly demands between 12:00 p.m. and 8:00 p.m. for that Resource for the months of June, July, August and September in that same Summer Capability Period; and if hour h is in the Winter Capability Period, the Average of Peak Monthly Demands is calculated using the peak monthly demands between 12:00 p.m. and 8:00 p.m. for that Resource for the months of December, January, February and March in that same Winter Capability Period.

(d) **Determining the ICE of the Amount of UCAP Supplied**

(1) **ICE for a Special Case Resource if the Amount of UCAP that Resource Qualifies to Provide Is Calculated Using Subsections 3.3(a) or (c)**

If a Special Case Resource uses the method specified in subsections 3.3(a) or (c) to determine the amount of UCAP it is qualified to supply, its ICE shall be calculated as follows:

$$ICE_{gm} = APMD_{gm} - CMD_{gm}$$

where:

ICE_{gm} is the Installed Capacity Equivalent of the amount of Unforced Capacity that Resource g supplies in month m;

$APMD_{gm}$ is the Average of Peak Monthly Demands for Resource g applicable to month m, using data submitted in accordance with the SCR Workbook and as calculated in subsection (a) or (c) above (whichever is used to calculate the amount of UCAP it is qualified to supply); and

CMD_{gm} is the Committed Minimum Demand for Resource g applicable to month m, using data submitted in accordance with the SCR Workbook,.

   (2)   ICE for a Special Case Resource if the Amount of UCAP that Resource Qualifies to Provide Is Calculated Using Subsection 3.3(b)

If a Special Case Resource uses the method specified in subsection 3.3(b) to determine the amount of UCAP it is qualified to supply, its ICE of shall be as follows:

   $ICE_{gm} = CGO_{gm}$

   where:

   ICE_{gm} is the Installed Capacity Equivalent of the amount of Unforced Capacity that Resource g supplies in month m; and

   CGO_{gm} is the Committed Generator Output for the generator(s) located at Resource g applicable for month m, using data submitted in accordance with The SCR Workbook, Special Case Resource Certification.

(e)   Determining RIP Deficiencies for RIP Portfolios

   A RIP will not be charged with a deficiency penalty if the performance of its portfolio of Special Case Resources, within a Locality or the Rest-of-State region, as applicable, meets or exceeds the total capacity it is committed to supply from its aggregated Special Case Resources. Just as a Special Case Resource is expected to meet its Installed Capacity commitment for a minimum of one hour each Capability Period, a RIP portfolio must meets its certified Installed Capacity commitment (the Installed Capacity Equivalent of its certified Unforced Capacity) for a minimum of one hour. This calculation will be performed on an hour by hour basis for each hour of each Special Case Resource event and for any audit hours, if any.

   The performance of each curtailable Load Special Case Resource will be the difference between its APMD and its AMD (terms as defined in Section 3.3(a) above) in MWh for each event hour. The total performance of all curtailable Load Special Case Resources in a single portfolio will be the sum of all such differences for the same hour of each event by Locality or the Rest-of-State region, as applicable.

   The performance of each generator based Special Case Resource will be its production in MWh for each hour. The total performance of all generator based Special Case Resources in a portfolio will be the sum of all such Special Case Resources for the same hour of each event by Locality or the Rest-of-State region, as applicable.

   The RIP performance will be the sum of all curtailable Load Special Case Resources within a Locality or the Rest-of-State region, as applicable, and all generator based Special Case Resources within a Locality or the Rest-of-State region, as applicable in its portfolio, calculated according to the above two paragraphs for the same hour of each event. To determine if the RIP is deficient,

the best hour will be compared to the Installed Capacity equivalent of its certified Unforced Capacity for each applicable month. The RIP deficiency, if any, will be the minimum difference between the Installed Capacity Equivalent of its certified Unforced Capacity and the portfolio performance. If this quantity is negative or zero, then there is no deficiency. Any deficiency penalty will be determined according to the Market Administration and Services Tariff for each month in the Capability Period.

(f)   Determining RIP Performance and Performance Factors Applicable to New SCRs

Resource performance for each RIP portfolio will combine all hours of all events and/or audits into an overall performance factor. The overall RIP portfolio performance factor will be the ratio of the sum of the performances of all curtailable Load Special Case Resources and all generator based Special Case Resources divided by the sum of the committed ICE of all certified curtailable Load Special Case Resources and all generator based Special Case Resources in the RIP portfolio for all requested event hours.

3.4   Calculation of UCAP for Control Area System Resources

(a)   Determining the Amount of UCAP a Control Area System Resource Qualifies to Supply

$$UCAP^Q_{cm} = NPC_{cm} \times (1 - CAF_{cm})$$

where:

$UCAP^Q_{cm}$ is the Unforced Capacity that the Control Area System Resource located in the Control Area c is qualified to supply in the NYCA during month m;

NPC_{cm} is the Net Projected Capacity calculated pursuant to the formula set forth in Section 4.10.3 of this Manual, repeated below for clarity:

$$NPC_{cm} = CAP_{cm} + EP_{cm} + LM_{cm} - PL_{cm} - ES_{cm} - LS_{cm} - PM_{cm} - PR_{cm};$$

and

CAF_{cm} is the derating factor applicable to the Control Area System Resource providing Installed Capacity from Control Area c for month m, representing the average proportion of its Installed Capacity Equivalent that that Control Area System Resource was able to provide during months $m - 14$ through and including $m - 3$, calculated as follows:

$$CAF_{cm} = \frac{\sum\limits_{i=b}^{e} \max\left(0,\ ICE_{ci} - (CAP_{ci} + EP_{ci} + LM_{ci} - L_{ci} - ES_{ci} - LS_{ci} - PM_{ci} - FO_{ci} - OR_{ci})\right)}{\sum\limits_{m=B}^{E} ICE_{cm} TH_m}$$

where:

i is an hour in which the Control Area System Resource provided Installed Capacity to the NYCA*;*

b is the beginning of the month 14 months before month *m,* or the time at which Capacity began to be provided from Control Area *c* under the terms of this section, if later;

e is the end of the month 3 months before month *m;*

ICE_{ci} is the Installed Capacity equivalent of the amount of Unforced Capacity supplied from a Control Area System Resource providing Installed Capacity from Control Area *c* during the month containing hour *i*;

CAP_{ci} is the actual maximum total generating Capacity in hour *i* in Control Area *c*;

EP_{ci} is the actual External firm Capacity purchases in hour *i* by Control Area *c*, other than purchases from Resources in the NYCA;

LM_{ci} is the actual amount of load management (*i.e.,* interruptible load) in hour *i* in Control Area *c*;

L_{ci} is the Load in hour *i* for Control Area *c*, including system losses;

ES_{ci} is the actual External firm Capacity sales in hour *i* by Control Area *c*, other than firm capacity sales to NYCA;

LS_{ci} is the actual losses, up to the border of the NYCA, that would have been incurred in hour *i* on transactions corresponding to sales of Unforced Capacity by that Control Area System Resource outside the Control Area;

PM_{ci} is the amount of generating Capacity in Control Area *c* that was actually unavailable in hour *i* due to planned maintenance;

FO_{ci} is the amount of generating Capacity in Control Area *c* that was actually unavailable in hour *i* due to forced outages;

OR_{ci} is the amount of operating reserve that was actually available for Control Area *c* in hour *i*;

E is the month containing e;

B is the month containing *b;*

ICE_{cm} is the Installed Capacity Equivalent of the amount of Unforced Capacity provided from a Control Area Resource associated with Control Area *c* during month *m*, and

TH_m is the total number of hours in month *m* in which the Control Area System Resource provided Installed Capacity to the NYCA.

(b)   Determining the ICE of the Amount of UCAP Supplied

$ICE_{cm} = UCAP^P_{cm} / (1 – CAF_{cm}),$

<u>where:</u>

ICE_{cm} is the Installed Capacity equivalent of the amount of Unforced Capacity supplied from Control Area *c* in month *m*;

$UCAP^P_{cm}$ is the amount of Unforced Capacity supplied from Control Area *c* in month *m*; and

CAF_{cm} is the Capacity Adjustment Factor for Control Area *c* for month *m*, as calculated above.

3.5   Calculation of UCAP for Wind Generators

This section describes the general procedure for calculating Unforced Capacity values for wind generators. Also see Section 4.5 of this Manual and 5.12.6(a) of the Market Administration and Control Area Services Tariff.

(a) Definitions

For purposes of this Section 3.5:

"Unforced Capacity" for an Intermittent Power Resource means that amount of generating capacity, expressed to the nearest tenth of a MW, that it can reasonably be expected to contribute during summer or winter peak hours, as applicable, and for these calculations, an Intermittent Power Resource is considered to be a collection of wind turbines (a "Wind Farm") with its electrical output totaled at some point between the Wind Farm and the NYCA transmission system and that determines the Wind Farm's delivery to the NYCA.

"Production Factor" for an Intermittent Power Resource means a factor based on historic operating data, and for facilities without historic operating data, initial Unforced Capacity

values will be determined using the factors defined in Section 4.5 of this Manual and in this Section 3.5.

 "Installed Capacity" for an Intermittent Power Resource means the resource's nameplate output rating, less the Station Power, which is defined in the Market Administration and Control Area Services Tariff and, as a general matter, refers to the amount of energy that is consumed to operate all auxiliary equipment and control systems to deliver the Intermittent Power Resource's energy to the NYCA transmission system.

"Hourly Output" means the average of the metered outputs, expressed to the nearest tenth of a MW, integrated over a one-hour period.

"Summer Peak Hours" means the hours beginning 14, 15, 16, and 17 during the three-month period from June 1 through August 31, inclusive.

"Winter Peak Hours" means the hours beginning 16, 17, 18 and 19 during the three-month period from December 1 through the last day of the immediately succeeding February, inclusive.

(b) Determining the Amount of UCAP a Wind Farm Qualifies to Supply

Generally, the calculation of the Production Factor for a particular Intermittent Power Resource (Wind Farm) for a Summer Capability Period is based on its operating data for the immediately preceding Summer Capability Period, and the calculation of the Production Factor for a particular Wind Farm for a Winter Capability Period is based on its operating data for the immediately preceding Winter Capability Period. For facilities with less than sixty (60) days of historic operating data in the previous Summer Capability Period or the previous Winter Capability Period, as applicable, initial Unforced Capacity values will use the factors in Section 4.5 of the Installed Capacity Manual for the applicable Capability Period. The Production Factor, when multiplied by the current Installed Capacity value, yields the Unforced Capacity value for that Intermittent Power Resource. This two-step process accommodates any changes in the Installed Capacity value that may have occurred during the prior or current year of operation.

$UCAP^{Q}_{gm}$, the amount of Unforced Capacity that Resource g is qualified to provide in month m, is calculated as follows:

$$UCAP^{Q}_{gm} = ProdF_{gm} \times DMNC_{gm},$$

where:

> $ProdF_{gm}$ is the production factor used in the calculation of the amount of Unforced Capacity that supplier g is qualified to provide in month m; and

$DMNC_{gm}$ is the nameplate capacity of Resource g that is applicable when determining the amount of Unforced Capacity that Resource g is qualified to provide in month m.

$ProdF_{gm}$, in turn, is calculated as follows:

$$ProdF_{gm} = \frac{\sum_{h \in CPPH_m} E_{gh}}{\sum_{h \in CPPH_m} DMNC_{gh}},$$

where:

$CPPH_{gm}$ is the set of all Summer Peak Hours during the most recent Summer Capability Period preceding the Capability Period containing month m (if month m is part of a Summer Capability Period) during which Resource g was available for commercial operation, or the set of all Winter Peak Hours during the most recent Winter Capability Period preceding the Capability Period containing month m (if month m is part of a Winter Capability Period) during which Resource g was available for commercial operation;

E_{gh} is the amount of energy, net of station service obligations, generated by Resource g during hour h; and

$DMNC_{gh}$ is the nameplate capacity of Resource g that was applicable when determining the amount of Unforced Capacity that Resource g was qualified to provide in hour h;

except that for new Wind Farms for which less than sixty (60) days of production data are available to calculate $ProdF_{gm}$ using the equation above, $ProdF_{gm}$ instead will be calculated in accordance with Section 4.5 of the Installed Capacity Manual.

3.6 Calculating UCAP for Installed Capacity Delivered over UDR Facilities

The amount of UDRs assigned by the NYISO to each new incremental transmission facility, and any future adjustments thereto, will be based on the transmission capability, reliability, and availability of the facility, and appropriate NYSRC reliability studies.

The NYISO may request additional information as necessary and will grant UDRs to the requestor, or designated rights holder, quantified as the Installed Capacity Equivalent of the Unforced Capacity to be delivered to the Interconnection Point in MW, throughout its project life.

The amount of UDRs awarded to a particular project may be adjusted periodically by the NYISO. Adjustments to such an award will reflect changes in physical characteristics and availability of the associated project.

$UCAP^{Q}_{gm}$, the amount of Unforced Capacity that Resource g is qualified to provide in a Locality in month m through the use of UDRs, is calculated as follows:

$$UCAP^{Q}_{gm} = (\text{Resource}_{ICAP} - \text{Loss}_{FL}) * P_{resource} * P_{cable}$$

where

Resource_{ICAP} = The sum of the DMNCs of the Resources (or portions thereof) used to supply ICAP in association with a given set of UDRs, as established by tests performed by those Resources that are applicable when determining the amount of Unforced Capacity that Resources are qualified to provide in month m;

Loss_{FL} = cable and converter station losses at the rated UDR level;

$P_{resource}$ = one minus a weighted average of the EFORds calculated for the Resources used to supply ICAP in association with a given set of UDRs, with the weights proportional to the DMNC of each Resource (or portion thereof) thereby used to supply ICAP; and

P_{cable} = one minus the cable outage rate, including cable and converter station unavailability.