NYISO Installed Capacity Manual

<u>Draft Appendix J</u>

Implementation of Unforced Capacity for ICAP Supplier Qualifications

- This draft contains NYISO Proposals Subject to Discussion by ICAPWG and Agreed-Upon Changes

- The Substance of this Attachment is new so the NYISO did not mark any modification or deletion.

- Notes for the Working Group's consideration are in brackets, double underlined, and highlighted, <u>[like this]</u>.

Prepared for the November 16, 2000 ICAPWG Meeting

1.0   Fundamental Formulas

1) $(12-i)/12$ (class average Forced Outage rate)

2) $EFOR_D = \{f_f * FOH + f_p * (EFOH - FOH)\} / (SH + f_f * FOH)$

3) $f_f = (1/r + 1/T) / (1/r + 1/T + 1/D)$

4) $f_p = SH / AH$

Note: UCAP values will be calculated for each Resource based on a rolling twelve-month calculation. The formulae for calculating these values (including treatments for class averages where new units are being phased in) are included here for each type of Resource.

2.0   Definitions

UCAP .... Unforced Capacity

$EFOR_D$ .... Equivalent Demand Forced Outage Rate

DMNC .... per Tariff definition

f_f .... full f-factor

f_p .... partial f-factor

FOH .... Full Forced Outage Hours

Forced Outage .... per Tariff definition

EFOH .... Equivalent Full Forced Outage Hours: Sum of all $(D_{fi} * T_{fi} / C_{fi})$ – The number of 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 economics or other reasons.

r .... average forced outage duration = FOH / (number of forced outages)

T .... average time between calls for a unit to run = RSH/(number of attempted starts)

D................................ average run time = SH / (number of successful starts)

D_{fi}............................... Capacity deration for forced outage i or forced deration (NERC U1, U2, U3…)

T_{fi} .... time accumulated during forced outage i, in hours, and

C_{fi} .... Net Dependable Capability or DMNC

3.0   Calculations

3.1   UCAP based on EFOR$_D$

A rolling, cumulative, twelve-month EFOR$_D$ will be calculated for each resource that submits GADS Data using Form (a) in Appendix [X]. The EFOR$_D$ for month (m) will be based on GADS Data for month, m-14, though month, m-2. (For example, EFOR$_D$ for July will be based on data submitted for June of the prior year through May of the current year.)

$$EFOR_D(m) = \{f_f * FOH + f_p * (EFOH - FOH)\} / (SH + f_f * FOH)$$

Where f_f, f_p, FOH, EFOH, and SH use twelve(12) months of cumulative GADS Data for month, m-14, through month, m-2.

$$UCAP(m) = [1 - EFOR_D(m)] \text{ x (applicable DMNC)}$$

3.2   Resources that have submitted less than 14 months of data

For Resources for which less than 14 months of GADS Data has been submitted, will be determined by a rolling, cumulative, EFOR$_D$ for the months that the Resource has submitted GADS Data using Form (a) in Appendix [X] as in Section 3.1 of this Appendix J. This will be weighted with the NERC class average outage rate for the applicable Resource type as follows:

$$EFOR_D(m) = (i/12)[f_{f_i} * FOH_i + f_{p_i} * (EFOH_i - FOH_i)] / (SH_i + f_{f_i} * FOH_i) +$$
$$(12 - i)/12 \text{ (class average Forced Outage rate)}$$

where i is the number of months of cumulative GADS Data available and f_{f_i}, FOH_i, f_{p_i}, $EFOH_i$, and SH_i are i months of cumulative GADS Data for i months prior to and including month, m-2.

$$UCAP(m) = [1 - EFOR_D(m)] \text{ x (applicable DMNC)}$$

3.3   UCAP Based on Data Equivalent to GADS Data

A rolling cumulative twelve-month EFOR will be calculated for each Resource that submits equivalent GADS Data using Form (b) in Attachment [X]. The EFOR for month (m) will be based on the equivalent GADS Data from month, m-14, through month, m-2. (For example, EFOR for July will be based on data submitted for June of the prior year through May of the current year.)

$$EFOR(m) = EFOH / (FOH + AH)$$

Where all terms have the meanings defined in section 2.

$$UCAP(m) = [1 \ EFOR(m)] \text{ x (applicable DMNC)}$$

3.4   Alternative UCAP where EFOH, FOH and AH are not provided;

$$EFOR(m) = [1 - (Generation / (DMNC * PH)])$$

Where Generation is the total production in MWHrs for the period (i.e. twelve months):

$$UCAP(m) = 1 - EFOR(m) = Generation / (DMNC / PH)$$

3.5   System Resources

System Resources are required to submit GADS data or data equivalent to GADS data. UCAP will be calculated using one of the methods described in Sections 3.1, 3.2, or 3.3 above, as applicable.

3.6   Control Area System Resources

[The NYISO will convert the formulae included in Section 4.8 of the ICAP Manual for inclusion in this Appendix J.]

3.7   Energy Limited Resources

Energy Limited Resources are required to submit GADS data or data equivalent to GADS data. UCAP will be calculated using one of the methods described in Sections 3.1, 3.2, or 3.3 above, as applicable.

3.8   Interruptible Load Resources

The UCAP for Interruptible Load customers will be equal to the difference between the Attributed Peak Demand and the Contract Minimum Demand for each Interruptible Load.

For the Summer Capability Period, Attributed Peak Demand will be the greater of the Interruptible Load customer's average peak demand for June, July, August and September and the Interruptible Load customer's demand coincident with the Transmission District Peak, both for the previous Summer Capability Period. The Contract Minimum Demand will be the Interruptible Load customer's maximum load for any period it is requested to activate its UCAP obligation during the Summer Capability Period.

For the Winter Capability Period, Attributed Peak Demand will be the greater of the Interruptible Load customer's average peak demand for December, January, February and March and the Interruptible Load customer's demand coincident with the Transmission District Peak, both for the previous Winter Capability Period. The Contract Minimum Demand will be the Interruptible Load customer's maximum load for any period it is requested to activate its UCAP obligation during the Winter Capability Period.

3.9   Intermittent Power Resources

To calculate the Unforced Capacity for an Intermittent Power Resource, the historical Capacity factor shall be adjusted to remove the effects of all hours the Resource is out for Maintenance or Planned Outages.

$$UCAP\,(m) \;=\; Generation\,/\,(DMNC*AH\,)$$

Where Generation is the total production in MWHrs for the period (i.e. twelve months).

3.10   Special Case Resources that also are Interruptible Load Resources

UCAP will be determined in the same manner as section 3.x (above) reduced by an appropriate loss factor, to be determined.

3.11   Special Case Resources that also are Distributed Generators

UCAP = (1-EFOR) DMNC using GADS equivalent data - DMNC will be based on the maximum average hourly production over a four (4) consecutive hours in each Capability Period, reduced by an appropriate loss factor, to be determined.

3.12   Municipally-Owned Generation

[To be developed in consultation with ICAPWG.]