Attachment M:

Procedure to Apply for a Capacity Limited Resource (CLR), Energy Limited Resource (ELR) or Ambient Condition-Dependent Classification

Generation resources must submit specific operating data and supporting documentation to be considered for CLR/ELR status. Units claiming a UOL_N less than their ICAP equivalent must register as an ELR or a CLR with the NYISO. In addition, units whose output varies with ambient conditions must also register with the NYISO. Refer to "Energy Supplier Upper Operating Limits," below, for a detailed discussion of bidding, scheduling and applicable settlement rules for ELR and CLR resources.

Registration

To register a unit as a CLR, ELR, or as an Ambient Condition-dependent unit, NYISO Customers must submit the following information to the NYISO Customer Relations Department by US mail or courier delivery:

1. A letter requesting registration of specifically identified resources as CLR, ELR, or as Ambient Condition-dependent.
2. CLR units shall provide:
    a. A detailed description of how the unit can increase load from a normal upper operating limit (UOL_N) to an emergency upper operating limit (UOL_E). The emergency limit could be a peak firing load on the boiler or GT, removal of the last HP feedwater heater, etc. This data will be analyzed by the Market Monitoring and Performance Unit (MMP) in order to verify operating limits and Installed Capacity (ICAP) obligations;
    b. If the unit is time-limited at its UOL_E then the unit shall define the time limitation and include a brief explanation of the reason why operating at this load on a continuing basis is detrimental.
    c. A description of the limiting factor that establishes the UOL_N;
    d. If the CLR also is Ambient Condition-dependent, it shall comply with the submission requirements for Ambient Condition-dependent units, below; and
    e. Any further data or other information as may be requested by the NYISO to better understand the operating characteristics of the unit.
3. ELR units shall provide:
    a. A detailed explanation of why the unit is not able to run at full load for 24 hrs a day. Data should be submitted to show attainable MWH's for a 24 hr. period with associated limiting factors. This data should include, as applicable, environmental restrictions for NOx, SO2, etc. This data will be analyzed by the MMP in order to verify operating limits and ICAP obligations; and
    b. If the ELR also is Ambient Condition-dependent, it shall comply with the submission requirements for Ambient Condition-dependent units, below; and

c. Further data or other information as may be requested by the NYISO to better understand the operating characteristics of the unit.

4. Ambient Condition-Dependent Units shall provide:
   a. An operating curve for each unit consisting of UOL_N values versus the significantly impacting variable (UOL_N represents the upper MW limit at which a unit is able to operate on a regular and continuous basis.) If emergency energy will be offered the curve for each unit shall also indicate the UOL_E values versus the significantly impacting variable.

All units seeking special status shall also submit contact information including name, address, phone, fax, and email for the individual qualified to discuss the particular circumstances for each unit and a letter from a Licensed Professional Engineer certifying the accuracy of the submitted information for each unit.

Applicants must include the PTIDs and names contained in OASIS for their resources in all documentation submitted to the NYISO. Applicants must also provide electronic versions of each unit's UOL_N and UOL_E curves in spreadsheet format.

Information should be submitted to the NYISO Customer Relations Department at:

NYISO Customer Relations Department

5172 Western Turnpike

Altamont, NY 12009

Energy Supplier Upper Operating Limits

Energy suppliers must specify both a Normal and an Emergency Upper Operating limit in their Day-Ahead and Real-Time offers. A special protocol exists for scheduling the capacity above the Normal Upper Operating Limit. Specific settlement conditions may also apply.

Details

Normal and Emergency Upper Operating Limits (UOL_N and UOL_E)

All energy Suppliers are required to specify both a Normal Upper Operating Limit (UOL_N) and an Emergency Upper Operating Limit (UOL_E) in their Day-Ahead ("DA") and Real-Time ("RT") offers. The UOL_N defines the unit's operating limit under normal system conditions; the UOL_E defines the unit's operating limit achievable at the request of the ISO during extraordinary conditions. Both limits should reflect the unit's achievable capacity. The specified value of UOL_E in the DA and RT offers must be greater than or equal to value specified for UOL_N.

The following terms are used in this Attachment:

ICAP obligation	The capacity a capacity supplier is required to bid into the DA Market ("DAM") which, as a general matter, equals the ICAP

	equivalent of its UCAP sales less any capacity that has been derated for that day's DAM as defined in the ISO Procedures,[1] prorated by the share of the derated resource committed to provide ICAP to New York (i.e., multiplied by $UCAP^{P}_{gm}$ / $UCAP^{Q}_{gm}$ as defined in Attachment J of this Manual).
Ambient Condition-dependent units	Units that may be unable to reach the ICAP equivalent of their UCAP sales due to changes in ambient air or water temperature. Ambient Condition-dependent units are not automatically considered CLR units. Their dependency on ambient conditions must be registered with the NYISO if the unit will be bidding into the DAM a UOL_N that is less than the ICAP obligation.
Daily energy limit	The energy equivalent of a unit's ICAP obligation over at least four hours.[2]

Capacity Suppliers registered with the NYISO as Capacity Limited Resources (CLR), Energy Limited Resources (ELR) or as Ambient Condition-dependent units may bid a UOL_N below their ICAP obligation as described in the applicable sections below. All other Capacity Suppliers should bid a UOL_N that is at least equal to their ICAP obligation and a UOL_E at least equal to their ICAP obligation unless the capacity of the unit has been derated for that day's DAM as defined in the ISO Procedures. The procedures for registering with the NYISO, including details on the required operating data and supporting documentation, is described in above under "Procedure to Apply for a Capacity Limited Resource (CLR), Energy Limited Resource (ELR) or Ambient Condition-Dependent Classification."

1.1 Capacity-Limited Resource (CLR)

A Capacity Limited Resource (CLR) is an energy supplier that is able to take extraordinary measures to reliably increase its output above its UOL_N and has sold UCAP based on taking those extraordinary measures. It is defined in the tariff as:

> *A resource that is constrained in its ability to supply energy above its Normal Upper Operating Limit by operational or plant configuration characteristics.*[3]

To register as a CLR unit, the unit operator must describe the operational or plant configuration changes that can be taken to increase output. Examples of a CLR include, but are not limited to,

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[1] See Technical Bulletin #25 "Updating Generator Limits Used in Real-Time via Transmission Owners" for discussion of communicating derates to the ISO.

[2] Units capable of generating at a level equal to their ICAP obligation for more than four hours but fewer than 24 hours have a daily energy limit equal to: the product of their ICAP obligation and the number of hours they are capable of generating at that rate, plus the additional energy available at other hours during which they are capable of operating at less than their ICAP obligation.

[3] Temperature dependency alone is not an operational or plant configuration characteristic – see section below entitled "Ambient Condition-Dependent Units."

(i) a combustion turbine that has peak firing or inlet cooling capability, and (ii) a steam plant that has the ability to remove its top feedwater heater from service. An Ambient Condition-dependent unit that is not able to take extraordinary measures to reliably increase its output above UOL_N is not considered a CLR unit. However, its dependency on ambient conditions must be registered with the NYISO if the unit will be bid into the DAM with a UOL_N that is less than its ICAP obligation.

UOL_N and UOL_E in the CLR Offer

The UOL_E submitted for the CLR resource must be: (i) greater than or equal to that of UOL_N in both the DA and RT offer; (ii) achievable at the request of the NYISO under extraordinary conditions; and (iii) in the DA offer, equal to or greater than the unit's ICAP obligation. A CLR unit may also be an Ambient Condition-dependent unit, in which case the UOL_E may also be derated, if appropriately justified to the NYISO, to account for its Ambient Condition-dependency. The UOL_N in the supplier's Day-Ahead offer should represent the supplier's actual capability under normal operating conditions, as reflected in the CLR description submitted to the NYISO.

CLR Scheduling and Settlements

Day-Ahead: As a general matter, the NYISO will establish DA schedules using bid-in UOL_N as the upper operating limit for all units and will not schedule any unit above that limit. However, if the NYISO determines that employing these limits in the DAM would lead to the violation of reliability based criteria, the NYISO will use the UOL_E of all units as the upper operating limit, for the DAM commitment process, and may schedule any unit up to its UOL_E[4].

If a CLR unit receives a DA schedule above its UOL_N which it cannot meet, it may request that the NYISO reduce its effective RT UOL to a level equal to or greater than its UOL_N ("capacity limited UOL"). If, pursuant to the CLR's request, the NYISO establishes a RT schedule based on the CLR's capacity limited UOL, ("capacity limited schedule"), that portion of its DAM schedule above its capacity limited schedule shall balance at the RT price for Energy, Operating Reserve Service and Regulation Service.

Real-Time: The NYISO will carry the upper operating limit used to establish the DA schedule into RTC and RTD to establish the RT schedule. Notwithstanding the use of the UOL_N as the upper operating limit in the DAM, the NYISO may, in accordance with its Emergency Operating Procedures ("EOP"), use the UOL_E of all units as the upper operating limit for establishing RT schedules. Therefore, a CLR with a DA schedule at or below its bid UOL_N will not be called on to operate above its UOL_N in Real-Time, except in accordance with the NYISO's Emergency Operating Procedures (EOP).

If a CLR unit receives a RT schedule above its UOL_N which it cannot meet, it may request that the NYISO reduce the CLR's UOL to a level equal to or greater than its UOL_N.

[4] The applicable reliability criteria consider transmission constraints and reliability based locational reserve requirements - specifically all NYCA, Eastern NY 10-minute, and Long Island 30-minute reserve requirements.

1.2 Energy-Limited Resource (ELR)

An Energy Limited Resource (ELR) is an energy supplier that is unable to operate at a level that represents its ICAP obligation for all hours of the day, but can operate at that level for at least four consecutive hours of each day. It is defined in the tariff as:

> *A resource that, due to environmental restrictions on operations, cyclical requirements, such as the need to recharge or refill, or other non-economic reasons, is unable to operate continuously on a daily basis, but is able to operate for at least four consecutive hours each day. Energy Limited Resources must register their energy limiting characteristics with, and justify them to, the ISO consistent with ISO procedures.*

To register as an ELR a unit operator must describe the unit's physical energy limiting characteristics, as well as its daily energy limit. Examples of an ELR include, but are not limited to (i) a hydro unit that is subject to recharge periods, or (ii) a generator with NOx and/or SOx restrictions.

UOL_N and UOL_E in the ELR Offer

The value of UOL_E submitted for an ELR resource must be: (i) greater than or equal to that of UOL_N in both the DA and RT offers; (ii) achievable for a minimum of four consecutive hours in any day; and (iii) in the DA offer, equal to or greater than the unit's ICAP obligation. An ELR unit may also be Ambient Condition-dependent in which case the UOL_E may be derated, if appropriately justified to the NYISO, to account for its Ambient Condition-dependency. The value of UOL_N in the supplier's Day-Ahead offer must:

- Fall within the supplier's actual capability under normal operating conditions, as reflected in the description submitted to the NYISO of the ELR situation,
- Reflect Ambient Condition-dependency if applicable; and
- Over the day, must make available to the NYISO at least its daily energy limit.

ELR Scheduling and Settlements

Day-Ahead: As a general matter, the NYISO will establish DA schedules using bid-in UOL_N as the upper operating limit for all units and will not schedule any unit above that limit. However, if the NYISO determines that employing these limits in the DAM would lead to the violation of reliability based criteria,[5] the NYISO will reference the UOL_E of all units as the upper operating limit, for the DAM commitment process, and any unit may be scheduled up to its UOL_E.

If an ELR unit receives a DA schedule above its UOL_N which it cannot meet, it may request that the NYISO reduce its effective UOL to a level equal to or greater than its UOL_N provided however that the NYISO may request that the effective UOL be established to ensure that the ELR unit is offering its daily energy limit over the hours requested by the NYISO (which may be

[5] The applicable reliability criteria consider transmission constraints and reliability based locational reserve requirements - specifically all NYCA, Eastern NY 10-minute, and Long Island 30-minute reserve requirements.

no fewer than four hours for the day). [6] Each such ELR unit will settle deviations between its RT and DA schedules at the RT LBMPs but shall be eligible for a Day-Ahead Margin Assurance Payment, if necessary, to guarantee its Day-Ahead margin on an hourly basis.

Real-Time: The NYISO will carry the upper operating limit used to establish the DA schedule into RTC and RTD to establish the RT schedule. Notwithstanding the use of the UOL_N as the upper operating limit in the DAM, to prevent or address an emergency, the NYISO may notify the ELR generator operator that the NYISO requires operation above the UOL_N for a period of the NYISO's choice (which may be continuous), provided it does not cause the ELR resource to exceed its daily energy limit. This notification is made via e-mail and/or RTC_{15} schedule posting.

Whenever the NYISO requests that a registered ELR operate to a modified schedule the following will apply:

1. The ISO will determine the necessary schedule modifications, and notify the ELR operator via the Transmission Owner.
2. For hours in which the NYISO approves a modified schedule that is less than the original Day-Ahead schedule, the ELR will be flagged as derated for ELR purposes. In this case, the Real-Time UOL_N is set at the ELR derated UOL_N in these hours, and is also used for Real-Time operations.
3. For hours in which the modified schedule is greater than the original Day-Ahead schedule, the unit will be set Out-of-Merit.

1.3 Ambient Condition-Dependent Units

Capacity Suppliers whose UOL_N or UOL_E varies as a function of an ambient condition such as air temperature, must register those characteristics with the ISO. These suppliers must submit a UOL_N that is equal to or greater than their ICAP obligation reduced, if necessary, to account for the ambient condition such as ambient air temperature, pursuant to the registration information provided to the NYISO.

Suppliers wishing to take advantage of this option should submit operating data and an explanation of the manner in which their output varies as a function of an ambient condition to the NYISO.

Examples

The NYISO has developed several examples of the application of the rules and protocols described in this Attachment to the Installed Capacity Manual.

1.4 Example 1 – CLR

The example illustrates variations in upper operating limits for three ambient condition-dependent units, one of which is a CLR. Day-Ahead schedule and settlement are also discussed. The three suppliers are described below and summarized in the table that follows.

[6] Units capable of providing an ICAP equivalent of their UCAP sales for more than four hours may be requested to provide the energy equivalent of their ICAP obligation over the maximum number of hours that the unit can generate at a level equal to its ICAP obligation.

1. A combustion-turbine generator (CT-A) with a nameplate rating of 100 MW:
    - The nameplate rating is established at 59° F.
    - The maximum capacity decreases as ambient temperature increases above 59° F. Rate of decrease is 1% of nameplate rating for every 3° F above 59° F. CT-A has registered this characteristic with the ISO.
    - The summer capability of the generator (89 MW) is established at an ambient temperature of 92° F.
    - The generator is unable to increase output above its normal output. That is, the generator is not a CLR.
    - The generator has no recharge requirement. That is, it is not an ELR.
    - The generator is an Ambient Condition-dependent (air or water temperature) unit once it registers its characteristics with the ISO.
    - CT-A has an ICAP obligation that requires a temperature-adjusted Day-Ahead offer of at least 89 MW, adjusted to an ambient temperature of 92° F

2. A combustion turbine (CT-B) with a nameplate rating of 100 MW and an emergency rating of 110 MW.
    - The nameplate rating is established at 59° F.
    - The maximum capacity decreases as ambient temperature increases above 59° F. Rate of decrease is 1% of nameplate rating for every 3° F above 59° F. CT-B has registered this characteristic with the ISO.
    - The summer capability of the generator (89 MW) is established at an ambient temperature of 92° F.
    - The generator is able to increase output 10% above its normal output (to 98 MW) by peak firing and/or inlet cooling. That is, the generator is a CLR. CT-B has registered as a CLR with the ISO.
    - The generator has no recharge requirement. That is, it is not an ELR.
    - CT-B has an ICAP obligation that requires a temperature-adjusted Day-Ahead offer of at least 98 MW, adjusted to an ambient temperature of 92° F.

3. A run-of-the-river hydro generator (HYDRO-A) with a nameplate rating of 100 MW.
    - The nameplate rating is established with river flow near flood stage.
    - The maximum capacity decreases linearly as river flow decreases. HYDRO-A has registered this characteristic with the ISO.
    - The summer capability of the generator (50 MW) is established for an expected summer river flow that is only 50% of flood stage.
    - The generator is unable to increase output above its normal output. That is, the generator is not a CLR.
    - The generator has no recharge requirement. That is, it is not an ELR.
    - HYDRO-A has an ICAP obligation that requires a Day-Ahead offer of at least 50 MW, adjusted to a river flow of 50% of flood stage

	CT – A	CT-B	HYDRO-A

Nameplate MW	100 MW @ 59° F	100 MW @ 59° F	100 MW
Emergency MW	n/a	110 MW @ 59° F	n/a
Summer MW (normal)	89 MW @ 92° F	89 MW @ 92° F	50 MW
Summer MW (emergency)	n/a	98 MW @ 92° F	n/a

It is summer and it has been hot. The next day is expected to be a scorcher. Ambient temperature between the hours of 10:00 to 20:00 is expected to be 104° F. Ambient temperature in all other hours is expected to be 92° F. It has also been a dry summer and the river is flowing at only 20% of flood stage. The UOL_N and UOL_E for the generators' Day-Ahead offers are tabulated below.

	CT-A		**CT-B**		**HYDRO-A**	
	UOL_N	**UOL_E**	**UOL_N**	**UOL_E**	**UOL_N**	**UOL_E**
HB 0:00 – 9:00	89	89	89	98	20	20
HB 10:00 – 19:00	85	85	85	93.5	20	20
HB 20:00 – 23:00	89	89	89	98	20	20

Suppose all three generators were fully scheduled Day-Ahead and that no reliability-based security criteria were violated with schedules that respected each generator's UOL_N. Schedules for the next day are tabulated below. Deviations in Real-Time from the Day-Ahead schedule would be balanced at Real-Time prices. Barring derates in Real-Time, all generators will have fulfilled their ICAP obligations.

	CT-A	**CT-B**	**HYDRO-A**
HB 0:00 – 9:00	89	89	20
HB 10:00 – 19:00	85	85	20
HB 20:00 – 23:00	89	89	20

Now suppose all three generators were fully scheduled Day-Ahead and that reliability-based security criteria were violated with schedules that respected each generator's UOL_N. Each energy resource would be evaluated up to its UOL_E. Schedules for the next day are tabulated below. Deviations in Real-Time from the Day-Ahead schedule would be balanced at Real-Time prices. Barring derates in Real-Time, all generators will have fulfilled their ICAP obligations.

	CT-A	**CT-B**	**HYDRO-A**
HB 0:00 – 9:00	89	98	20
HB 10:00 – 19:00	85	93.5	20
HB 20:00 – 23:00	89	98	20

1.5 Example 2 – ELR

Example 2 illustrates variations in upper operating limit for two energy suppliers, one of which is an ELR and the other of which is an ambient condition-dependent unit. Day-Ahead schedule and settlement are also discussed. The two suppliers are described below and summarized in the table that follows.

1. A run-of-the-river hydro generator (HYDRO-A) with a nameplate rating of 100 MW.
   - This generator is identical to the generator of the same name in the preceding example.

2. A hydro generator (HYDRO-B) with a pond. HYDRO-B can operate for four hours at maximum capacity if the pond is full. HYDRO-B has a nameplate rating of 100 MW.
   - The nameplate rating can be achieved with a full pond.
   - The maximum capacity is constant until the pond is empty.
   - The pond can be recharged over night at any time of the year.
   - The generator is unable to increase output above its normal output. That is, the generator is not a CLR. HYDRO-B has registered as an ELR with the ISO.
   - HYDRO-B has an ICAP obligation that requires a Day-Ahead offer of at least 100 MW for four hours of the day.
   - HYDRO-B wants to operate from 12:00 to 16:00 hours.

	HYDRO-A	**HYDRO-B**
Nameplate MW	100 MW	100 MW
Emergency MW	n/a	n/a
Summer MW (normal)	50 MW	100 MW
Summer MW (emergency)	n/a	n/a
Energy Limit	n/a	400 MWH

It is summer and it has been hot. Regardless of the expected temperature for the next day, and it is expected to be a scorcher, the river is flowing at only 20% of flood stage. The UOL_N and UOL_E for the generators' Day-Ahead offers are tabulated below.

	HYDRO-A		**HYDRO-B**	
	UOL_N	**UOL_E**	**UOL_N**	**UOL_E**
HB 0:00 – 11:00	20	20	0	100
HB 12:00 – 15:00	20	20	100	100
HB 16:00 – 23:00	20	20	0	100

Suppose all three generators were fully scheduled Day-Ahead and that no reliability-based security criteria were violated with schedules that respected each generator's UOLN. Schedules for the next day are tabulated below. Baring derates in Real-Time, all generators will have fulfilled their ICAP obligations.

	HYDRO-A	**HYDRO-B**
HB 0:00 – 11:00	20	0
HB 12:00 – 15:00	20	100
HB 16:00 – 23:00	20	0

If the ISO detects a security problem during Real-Time operation, the ISO may ask HYDRO-B to modify its schedule. In such a case the Day-Ahead Margin Assurance Payment ("DAMAP") provides certain guarantees that HYDRO-B will not be harmed by balancing charges.

Now suppose all three generators were fully scheduled Day-Ahead and that reliability-based security criteria were violated with schedules that respected each generator's UOLN. Each energy resource would be evaluated up to its UOL_E. Schedules for the next day are tabulated below. Barring derates in Real-Time, all generators will have fulfilled their ICAP obligations.

	HYDRO-A	**HYDRO-B**
HB 0:00 – 9:00	20	0
HB 10:00 – 11:00	20	100
HB 12:00 – 15:00	20	100
HB 16:00 – 17:00	20	100
HB 18:00 – 23:00	20	0

HYDRO-B clearly has been given an impossible schedule. It is scheduled to operate for eight hours, but is only able to operate for four hours. HYDRO-B may request an ELR derate for four hours. Its schedule would be modified so that it runs for only four of the hours. Normally the four hours would be chosen by HYDRO-B, but, for reliability considerations, the ISO reserves the right to choose the hours of operation. In the event of an ELR derate or a schedule modification directed by the ISO, the DAMAP provides certain guarantees that HYDRO-B will not be harmed by balancing charges.