

## **Rules Change Recommendation for Energy payments and Under-generation Penalties during Start-up and Shut-down Periods**

### Background

NYISO market design provides for a five minute period prior to a unit's scheduled start time in which the ISO will ramp a starting unit from essentially 0 MW to either its minimum generation level or scheduled operating level whichever applies. Units are ramped so as to reach the desired level within the 5 minute period without regard for ramp rate. The assumption behind this approach is that units will actually startup whenever they have to in order to reach their scheduled output at the appointed time, energy produced during the actual startup period will therefore be uninstructed generation for which they will receive no energy payment and the cost for actual startup will be included in the unit's startup cost offer. For some circumstances such as a unit that normally runs for long periods of time after starting up, startups generally follow maintenance outages and the process is fairly long and the unit's output is determined by the progress of the startup process during which it cannot respond reliably to dispatch instructions and many of these units follow the process described and simply dump their energy into the grid during their startup process. The ISO's dispatch software will in fact recognize the actual energy being received from such units at the time it is being produced and will take it into consideration when dispatching units that are actually being dispatched by the ISO. Forecasting processes are however unaware of the likely presence of such energy since they use scheduled or offered energy to determine the commitment and dispatch forecasts and are not aware of units that are, or intend to be in an un-bid startup process.

An alternative means of managing the startup process that results in lower startup offers is for the unit to be bid into the Hour Ahead Market (HAM) for the startup period as a price-taking unit (no startup cost and \$0 incremental energy cost) for the operating range between 0 MW and its minimum generation level or the Day Ahead Market (DAM) scheduled operating level whichever applies. In this way the unit will receive LBMP for energy produced during startup up to the amount bid into the HAM thereby allowing the unit to lower the risk of exceeding its DAM startup offer and/or potentially reduce its day-ahead startup cost offer and improve its competitive position in the DAM. This approach is the frequent choice of cycling units (units that are often scheduled to operate for less than a full 24 hour day and therefore engage in a daily startup and shutdown process).

### Current Issues

As noted earlier one drawback of the current options available to generators is that those units that do not schedule into the HAM for their startup process will dump their energy into the market unscheduled and therefore create a variance to the forecasted real-time load balance.

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For those units utilizing the HAM market to recover LBMP for the energy produced, their inherent operating uncertainty during this startup period creates either the risk of under-generation penalties if they over-forecast their output or failure to receive revenue for uninstructed generation if the under-forecast. Under SMD2 these units can provide ¼ hour incremental estimates of their output which improves their ability to proscribe expected unit performance but leaves them exposed when any unexpected interruptions or delays occur in the start-up process.

The same kind of problem exists during shutdown but to a lesser degree. Penalties and withheld compensation during shutdown like during startup is none-the-less ineffective as an incentive to perform in any particular manner and any lost revenue or potential penalties during this period must be estimated by generators and the estimated values likely to appear in startup offers.

### Recommended Rule change

For those units utilizing the HAM market to recover LBMP for the energy produced during startup the schedule variants in output from what was offered in the HAM are not the result of owner operator conduct for which penalties are a means of disciplining behavior, but are rather the consequence of unit operating conditions during the start-up process. That is to say that the imposition of penalties for under-generation or withholding of compensation for over-generation are not an effective means to improve unit performance.

For units that are starting up and not scheduling that energy through the HAM (and consequently present the ISO's real-time scheduling process with a forecast variance) these penalties act as a disincentive to schedule startup in the HAM.

**It is therefore recommended that the under-generation penalty be dropped during unit startup and shutdown periods and that during these periods units be paid LBMP for all energy produced.**

Making such a change eliminates the necessity for generators using the HAM market for startup to inflate their startup offers to account for estimated penalties or potential uncompensated energy and it will eliminate risks or undesirable operating conditions that prevent other units from using the HAM and thereby remove this variant in the ISO's real-time forecasts.

### Recommended Method

Generators should be allowed to designate when they are in a start-up (SU) or shut down (SD) mode. When in a SU/SD mode, a plant would use self-scheduling options to inform the NYISO of estimated output, but would not be subject to performance penalties. The following mechanism and rules would apply:

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- The submittal of hours to be designated as SU or SD hours will be via email to a designated NYISO email address. Submittals to cover SU or SD for any day must be submitted within 24 hours following the subject day.
- When received and applied by the ISO, the SU/SD designation for any hour will be applied for the whole hour.
- The SU/SD designation will apply only in real-time as it will have no meaning for the day-ahead commitment and scheduling process.
- The plant cannot use the SU/SD mode during any hour with a day-ahead schedule.
- The plant will be treated as a self-scheduled unit during any hour when the SU/SD flag is set.
- The plant will self schedule with the NYISO a good-faith estimate of its energy production rate in quarter-hour increments for any hours when the SU/SD flag is set. The self scheduled energy estimates will be used for all NYISO real-time schedule forecasts. The unit's instantaneous schedule will be set to its actual output throughout the S/U or S/D periods.
- A plant's under-generation penalty will be suspended for any hour during which its SU/SD flag is set.
- The plant will be paid the locational marginal price of energy (LBMP) for net energy produced for any hour during which its SU/SD flag is set.
- The plant will not be protected by a real-time bid production cost guarantee for any hour when the SU/SD flag is set. Use of the SU/SD flag will not otherwise disqualify a plant from the protection of a real-time bid production cost guarantee for hours when the SU/SD flag is not set.
- The plant must be authorized by the NYISO to use the SU/SD designation.
- The maximum duration of the SU period and SD period must be agreed to by the NYISO prior to commencing submittals. A single plant-specific maximum for SU and SD periods will be registered with the NYISO. The actual scheduled periods may be less than the maximum.
- A typical cycling steam plant will have a two hour maximum startup or less and a 1 hour maximum shutdown period or less. SU or SD requirements in excess of

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these norms must be justified to the NYISO at the time of registration or for any specific startup occurrence for which an extended period is being requested.

- A detailed technical bulletin describing this rule change and the relevant rules and procedures will be produced and discussed with MPs prior to deployment of this change.

### Market Monitoring and Performance

It is expected that the primary users of the SU/SD feature will be cycling steam units with DAM schedules or baseload units with long and/or volatile startup periods that will want to establish a stable operating condition prior to scheduling day ahead.

In order to ensure that the elimination of penalties during S/U and S/D is not abused in some way, generators desiring to utilize this feature will be required to register with the MMP unit to establish their expected maximum S/U and S/D period durations. Typically we would not expect SU times to exceed two hours and shut down times should be less than 1 hour. Exceptions to these guidelines can be managed on a case by case basis.

The ISO's DSS software will provide to the MMP unit a regular report on the actual utilization of this feature for use by the MMP to determine potentially abusive behavior.

The NYISO retains the right to revoke the ability of any plant to use the SU/SD flag should it detect an adverse market or operational impact and after consultation with the generator determine it to be due to abusive behavior.

RMT

6/3/05