

**27.11 Registration of Use-Limited Capacity**

A Scheduling Coordinator on behalf of capacity that meets the definition of Use-Limited Capacity must follow the registration and validation processes set forth in the Business Practice Manual. Capacity of Hydroelectric Generating Units, Proxy Demand Resources, Reliability Demand Response Resources and Participating Load, including Pumping Load, must be registered through this process even though such capacity is deemed to be Use-Limited Capacity. Within five (5) business days, the CAISO will provide the Scheduling Coordinator with information concerning the status of the CAISO's validation process.

Formatted: Not Different first page header

Formatted: Font: Not Bold

\*\*\*

**30.4 Proxy Cost and Registered Cost Methodologies**

~~Scheduling Coordinators for Capacity of~~ Generating Units and Resource-Specific System Resources that ~~are~~ not Use-Limited ~~Capacity Resources~~ will be subject to the Proxy Cost methodology for ~~their~~ Start-Up Costs and Minimum Load Costs, as well as for Transition Costs in the case of Multi-Stage Generating Resources.

Scheduling Coordinators for Generating Units and Resource-Specific System Resources that ~~are~~have Use-Limited ~~Capacity Resources~~ may elect on a thirty (30) day basis to use either the Proxy Cost methodology or the Registered Cost methodology for specifying ~~their~~ Start-Up Costs and Minimum Load Costs to be used for those resources in the CAISO Markets Processes, as well as for Transition Costs in the case of Multi-Stage Generating Resources. The elections are independent as to Start-Up Costs and Minimum Load Costs; that is, a Scheduling Coordinator for a resource with a Use-Limited

~~Capacity Resource may~~ electing to use either the Proxy Cost methodology or the Registered Cost methodology for Start-Up Costs and may make a different election for Minimum Load Costs. However, in the case of Multi-Stage Resources, the Scheduling Coordinator must make the same election (Proxy Cost methodology or Registered Cost methodology) for Transition Costs as it makes for Start-Up Costs. If a

Formatted: Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Scheduling Coordinator has not made an election, the CAISO will assume the Proxy Cost methodology as the default.

~~Scheduling Coordinators for Multi-Stage Generating Resources may also register with the CAISO their Transition Costs on a thirty (30)-day basis.~~

**30.4.1.1 Proxy Cost Methodology**

**30.4.1.1.1 Natural Gas-Fired Resources**

For each natural gas-fired resource, the Proxy Cost methodology uses formulas for Start-Up Costs and Minimum Load Costs based on the resource's actual unit-specific performance parameters. The Start-Up Cost and Minimum Load Cost values utilized for each such resource in the CAISO Markets Processes will

be either (a) if the Scheduling Coordinator does not submit a Proxy Cost Bid, or (b) below:

- (a) Formulaic natural gas cost values adjusted for fuel-cost variation on a daily basis using the natural gas price calculated pursuant to Section 39.7.1.1.1.3.

Start-Up Costs also include: (i) the cost of auxiliary power calculated using the unit-specific MWh quantity of auxiliary power used for Start-Up multiplied by a resource-specific electricity price; (ii) a greenhouse gas cost adder for each resource registered with the California Air Resources Board as having a greenhouse gas compliance obligation, which is calculated for each Start-Up as the product of the resource's fuel requirement per Start-Up, the greenhouse gas emissions rate authorized by the California Air Resources Board, and the applicable Greenhouse Gas Allowance Price; (iii) the rates for the Market Services Charge and System Operations Charge multiplied by the shortest Start-Up Time listed for the resource in the Master File, multiplied by the PMin of the resource, multiplied by 0.5; and (iv) a resource-specific adder, if applicable, for major maintenance expenses (\$ per Start-Up) determined by the CAISO or Independent Entity selected by the CAISO to determine such major maintenance expenses.

Minimum Load Costs also include: (i) operation and maintenance costs as provided in Section 39.7.1.1.2; (ii) a greenhouse gas cost adder for each resource registered with the California Air Resources Board as having a greenhouse gas compliance obligation, which is calculated for each Start-Up as the product of the resource's fuel requirement at Minimum Load, the greenhouse gas emissions rate authorized by the California Air Resources Board, and the applicable Greenhouse Gas Allowance Price; (iii) the rates for the Market Services Charge and System Operations Charge multiplied by the PMin of the resource; (iv) the Bid Segment Fee; and (v) a resource-specific adder, if applicable, for

Six Cities' Comments on the April 16, 2015 Draft

major maintenance expenses (\$ per operating hour) determined pursuant to Section 30.4.1.1.4.

- (b) ~~ValuesBids~~ specified by Scheduling Coordinators pursuant to Sections 30.7.9 and 30.7.10, subject to the provisions applicable to Multi-Stage Generating Resources set forth in Section 30.4.1.1.3.

In the event that the Scheduling Coordinator for a resource other than a Multi-Stage Generating Resource or for a Multi-Stage Generating Resource in its lowest startable configuration, ~~unit~~ does not provide sufficient data for the CAISO to determine the ~~resource's unit's base~~ Proxy Costs or one or more of the additional components of the ~~resource's unit's~~ Proxy Costs, the CAISO will assume that the ~~resource's unit's base~~ Start-Up Costs and Minimum Load Costs, or the indeterminable additional component(s) of the ~~resource's unit's~~ Start-Up Costs or Minimum Load Costs, are zero. In the event that the Scheduling Coordinator for a Multi-Stage Generating Resource in an MSG Configuration beyond its lowest startable configuration does not provide such data, Section 30.4.1.1.3 applies.

Formatted: Not Highlight

Formatted: Highlight

**30.4.1.1.2 Non-Natural Gas-Fired Resources**

For each non-natural gas-fired resource, Start-Up Cost and Minimum Load Cost values under the Proxy Cost methodology shall be based on either (a) if the Scheduling Coordinator does not submit a Proxy Cost Bid, or (b) below:

- (a) The relevant cost information of the particular resource, including fuel or fuel equivalent input costs, which will be provided to the CAISO by the Scheduling Coordinator and maintained in the Master File.

Start-Up Costs will also include: (i) greenhouse gas allowance costs for each resource registered with the California Air Resources Board as having a greenhouse gas compliance obligation, as provided to the CAISO by the Scheduling Coordinator; (ii) the rates for the Market Services Charge and System Operations Charge multiplied by the shortest Start-Up Time listed for the resource in the Master File, multiplied by the PMin of the resource, multiplied by 0.5; and (iii) a resource-specific adder, if applicable, for major maintenance expenses (\$ per Start-Up) determined by the CAISO or Independent Entity selected by the CAISO to determine such major maintenance expenses.

Six Cities' Comments on the April 16, 2015 Draft

Minimum Load Costs also include: (i) operation and maintenance costs as provided in Section 39.7.1.1.2; (ii) greenhouse gas allowance costs for each resource registered with the California Air Resources Board as having a greenhouse gas compliance obligation, as provided to the CAISO by the Scheduling Coordinator; (iii) the rates for the Market Services Charge and System Operations Charge multiplied by the PMin of the resource; (iv) the Bid Segment Fee; and (v) a resource-specific adder, if applicable, for major maintenance expenses (\$ per operating hour) determined by the CAISO or an Independent Entity selected by the CAISO.

For each resource registered with the California Air Resources Board as having a greenhouse gas compliance obligation, the information provided to the CAISO by the Scheduling Coordinator must be consistent with information submitted to the California Air Resources Board. Adders for major maintenance expenses will be determined pursuant to Section 30.4.1.1.4.

- (b) ~~Value Bids~~ specified by Scheduling Coordinators pursuant to Sections 30.7.9 and 30.7.10, subject to the provisions applicable to Multi-Stage Generating Resources set forth in Section 30.4.1.1.3.

In the event that the Scheduling Coordinator for a resource other than a Multi-Stage Generating Resource or for a Multi-Stage Generating Resource in its lowest startable configuration unit does not provide sufficient data for the CAISO to determine one or more components of the unit's Proxy Costs, the CAISO will assume that the indeterminable component(s) of the resource's unit's Start-Up Costs or Minimum Load Costs are zero. In the event that the Scheduling Coordinator for a Multi-Stage Generating Resource in an MSG Configuration beyond its lowest startable configuration -does not provide such data, Section 30.4.1.1.3 applies.

**30.4.1.1.3 Multi-Stage Generating Resources**

The Proxy Cost methodology for calculating Start-Up Costs and Minimum Load Costs will apply to all the MSG Configurations for a Multi-Stage Generating Resource that ~~is does not a have~~ Use-Limited ~~Capacity Resource~~ and for a Multi-Stage Generating Resource that ~~has is a~~ Use-Limited ~~Capacity Resource~~ and elects to use the Proxy Cost methodology. The Proxy Costs (Start-Up Cost and

Formatted: Not Highlight

Six Cities' Comments on the April 16, 2015 Draft

Minimum Load Cost) values for Multi-Stage Generating Resources will be calculated for each specific MSG Configuration, including for each MSG Configuration that cannot be directly started. Notwithstanding the rules set forth in Sections 30.4.1.1.1(b) and 30.4.1.1.2(b), if a Scheduling Coordinator for a Multi-Stage Generating Resource, other than in its lowest startable configuration, does not provide sufficient data for the CAISO to determine a component of the Proxy Costs for a particular MSG Configuration, the CAISO will use the value for that component associated with the next lowest MSG Configuration, if that value is not zero.

\*\*\*

**30.4.1.1.5 Proxy Transition Cost**

For a Multi-Stage Generating Resource under the Proxy Cost methodology, the CAISO will calculate the Transition Costs utilized for each feasible transition from a given MSG Configuration to a higher MSG Configuration based on the difference between the Start-Up Costs for the higher MSG Configuration, minus the Start-Up Costs for the lower MSG Configuration, as determined in accordance with the Start-Up Cost calculation methodology set forth in Section 30.4.1.1. If the result of this calculation is negative for any transition between two MSG Configurations, then the associated Transition Cost shall be zero. The Transition Costs calculated by the CAISO will be utilized in the CAISO Markets Processes unless the Scheduling Coordinator submits Transition Costs for the Multi-Stage Generating Resource in the form of daily Bids that are less than or equal to one hundred twenty-five (125) percent of the Transition Costs calculated by the CAISO and are not negative, in which case the Transition Costs submitted in the form of daily Bids will be utilized in the CAISO Markets Processes.

\*\*\*

**30.4.1.2 Registered Cost Methodology**

(a) Under the Registered Cost methodology, the Scheduling Coordinator for a resource with a Use-Limited Capacity Resource may register values of its choosing for Start-Up Costs and/or Minimum Load Costs in the Master File for such Use-Limited Capacity subject to the maximum limit specified in Section 39.6.1.6. A Scheduling Coordinator for a Multi-Stage Generating Resource that has Use-Limited Capacity registering a Start-Up Cost must also register Transition Costs for each feasible MSG Transition, subject to the maximum limit specified in Section 39.6.1.7. For a

- Comment [A1]: This should be clarified to state what happens if the value is zero.
- Formatted: Highlight
- Formatted: Highlight
- Formatted: Font: Bold
- Formatted: Font: Bold
- Formatted: Font: Bold
- Formatted: Normal, No bullets or numbering, Tab stops: 0", Left
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Not Highlight
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Highlight
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black
- Formatted: Font: (Default) Arial, 10 pt, Font color: Black

Six Cities' Comments on the April 16, 2015 Draft

Use-Limited ~~CapacityResource~~ to be eligible for the Registered Cost methodology there must be sufficient information in the Master File to calculate the value pursuant to the Proxy Cost methodology, which will be used to validate the specific value registered using the Registered Cost methodology. Any such values will be fixed for a minimum of 30 days in the Master File unless: (a) the resource's costs for any such value, as calculated pursuant to the Proxy Cost methodology, exceed the value registered using the Registered Cost methodology, in which case the Scheduling Coordinator may elect to switch to the Proxy Cost methodology for the balance of any 30-day period, except as set forth in Section 30.4.1.2(b); or (b) any cost registered in the Master File exceeds the maximum limit specified in Section 39.6.1.6 or Section 39.6.1.7 after this minimum 30-day period, in which case the value will be lowered to the maximum limit specified in Section 39.6.1.6 or Section 39.6.1.7. If a Multi-Stage Generating Resource elects to use the Registered Cost methodology, that election will apply to all the MSG Configurations for that resource. The cap for the Registered Cost values for each MSG Configuration will be based on the Proxy Cost values calculated for each MSG Configuration, including for each MSG Configuration that cannot be directly started, which are also subject to the maximum limits specified in Sections 39.6.1.6 and 39.6.1.7.

- (b) If the alternative natural gas price set forth in Section 39.7.1.1.1.3(b) is triggered, and ~~a Use-Limited Resource's~~ the Start-Up Costs or Minimum Load Costs of Use-Limited Capacity calculated pursuant to the Proxy Cost methodology using the alternative gas price exceeds the value registered in the Master File, then the CAISO will switch the Use-Limited ~~CapacityResource~~ to the Proxy Cost methodology. Any Use-Limited ~~CapacityResource~~ switched to the Proxy Cost methodology pursuant to this Section 30.4.1.2(b) will revert to the Registered Cost methodology when the Use-Limited ~~Capacity'sResource's~~ alternative Proxy Cost calculation no longer exceeds the value registered using the Registered Cost methodology. These determinations will be made separately for both Start-Up Costs and Minimum Load Costs. The CAISO will not make a separate determination for Transition Costs but if a Start-Up Cost is switched to the Proxy Cost methodology, the Transition Costs of the Use-Limited Capacity will also be switched to the Proxy Cost methodology.

Formatted: Not Highlight

\* \* \*

**30.4.1.2.1 Registered Transition Cost Values**

For Use-Limited Capacity of a Multi-Stage Generating Resource under the Registered Cost methodology, the CAISO will calculate the Transition Costs utilized for each feasible transition from a given MSG Configuration to a higher MSG Configuration based on the difference between the Start-Up Costs for the higher MSG Configuration, minus the Start-Up Costs for the lower MSG Configuration, as determined in accordance with the Start-Up Cost calculation methodology set forth in Section 30.4.1.1. If the result of this calculation is negative for any transition between two MSG Configurations, then the associated Transition Cost shall be zero. The Transition Costs calculated by the CAISO will be utilized in the CAISO Markets Processes unless the Scheduling Coordinator submits and registers in the Master File Transition Costs that are less than or equal to one hundred fifty (150) percent of the Transition Costs values calculated by the CAISO and are not negative, in which case the Transition Costs submitted and registered in the Master File will be utilized in the CAISO Markets Processes.

Formatted: Highlight

\* \* \*

**30.4.2 Transition Costs**

~~Scheduling Coordinators may register and the CAISO will validate Transition Costs for Multi-Stage Generating Resources as described below. Once accepted by the CAISO, such Transition Costs will apply until modified and will apply for a minimum of thirty (30) days. Scheduling Coordinators may change their Transition Costs pursuant to the time line that applies to changes to the Master File. During the registration process, the Scheduling Coordinator shall submit a dollar value for each upward Transition Cost, including a Transition Costs multiplier which consists of the Transition Costs dollar value divided by the applicable monthly Thousand Thousand British Thermal Units (MMBtu) Gas Price Index on the day that the Scheduling Coordinator is registering the Transition Costs value with the CAISO. At the time of registration, the CAISO will validate that the upward Transition Costs dollar value and the Transition Costs multiplier are consistent. The CAISO will further validate the upward Transition Costs dollar values using the two rules described below, and will include the validated values in the Master File. The Scheduling Coordinator shall also submit a fuel input value, which consists of a quantity of natural gas in MMBtu, for each downward MSG Transition such that the fuel input value accurately reflects the~~

Six Cities' Comments on the April 16, 2015 Draft

~~operating characteristics of the Multi-Stage Generating Resource, which the CAISO may reject if perceived to be inconsistent with such characteristics. Through the Bid validation process in the CAISO Markets, the CAISO will adjust both the downward and upward Transition Costs by the daily Gas Price Index when Scheduling Coordinators submit Bids into the CAISO Markets for Multi-Stage Generating Resources to calculate the Transition Costs per the submitted Bid.~~

~~**Rule 1:** The CAISO will constrain the Transition Costs along each of the feasible, unidirectional MSG Transition paths from Off to each MSG Configuration such that their sum is between one hundred (100) percent and one hundred twenty five (125) percent of the MSG Configuration's proxy Start-Up Cost value plus ten (10) percent; where the MSG Configuration's proxy Start-Up Cost value is determined using the same methodology provided in Section 30.4.1.1 except that the CAISO will use the monthly Gas Price Index and the monthly Greenhouse Gas Allowance Price as opposed to the daily values. If the Scheduling Coordinator flags an MSG Configuration as able to Start-Up as part of its registration requirements in Section 27.8, the CAISO will use a value of \$0 as the lower bound for the MSG Transition paths up to the MSG Configuration flagged as able to Start-Up.~~

~~**Rule 2:** The CAISO will validate that the sum of Transition Costs for incremental MSG Transitions along a feasible, unidirectional path between two MSG Configurations is between one hundred (100) percent and one hundred twenty five (125) percent of the Transition Cost associated with the direct transition to the target MSG Configuration.~~

\* \* \*

**30.7.9 Format And Validation Of Start-Up Costs And Shut-Down Costs**

For a Generating Unit or a Resource-Specific System Resource, the submitted Start-Up Cost expressed in dollars (\$) as a function of down time expressed in minutes must be a staircase function with up to three (3) segments defined by a set of 1 to 4 down time and Start-Up Cost pairs. The Start-Up Cost is the cost incurred to start the resource if it is offline longer than the corresponding down time. The last segment will represent the cost to start the resource from cold Start-Up and will extend to infinity. The submitted Start-Up Cost function shall be validated as follows:

- (a) The first down time must be zero (0) min.



Six Cities' Comments on the April 16, 2015 Draft

- (b) The down time entries must match exactly (in number, sequence, and value) the corresponding down time breakpoints of the Start-Up Cost function, as registered in the Master File for the relevant resource as either the Proxy Cost or Registered Cost.
- (c) The Start-Up Cost for each segment must not be negative and must be equal to the Start-Up Cost of the corresponding segment of the Start-Up Cost function, as registered in the Master File for the relevant resource. In addition, if the Proxy Cost methodology pursuant to Section 30.4 applies to the resource, the Scheduling Coordinator for that resource may submit a daily Bid for the Start-Up Cost that must not be negative but may be less than or equal to one hundred twenty-five (125) percent of the Proxy Cost, and if the resource is a Multi-Stage Generating Resource, the Scheduling Coordinator may submit a daily Bid for each MSG Configuration of the resource that must not be negative but may be less than or equal to one hundred twenty-five (125) percent of the Start-Up Cost for the MSG Configuration. For a resource that is eligible and has elected to use the Registered Cost methodology pursuant to Section 30.4, if a value is submitted in a Bid for the Start-Up Cost, it will be overwritten by the Registered Cost reflected in the Master File. If no value for Start-Up Cost is submitted in a Bid, the CAISO will insert the Master File value, as either the Proxy Cost or Registered Cost based on the methodology elected pursuant to Section 30.4.
- (d) The Start-Up Cost function must be strictly monotonically increasing, i.e., the Start-Up Cost must increase as down time increases.

The Start-Up cost for a Reliability Demand Response Resource shall be zero (0). For Participating Loads and Proxy Demand Resources, a single Shut-Down Cost in dollars (\$) is the cost incurred to Shut-Down the resource after receiving a Dispatch Instruction. The submitted Shut-Down Cost must not be negative. For Multi-Stage Generating Resources, the Scheduling Coordinator must provide Start-Up Costs for each MSG Configuration into which the resource can be started.

\* \* \*

**39.6.1.6 Maximum Start-Up Cost and Minimum Load Cost Registered Cost Values**

The maximum Start-Up Cost and Minimum Load Cost values registered in the Master File by Scheduling Coordinators for capacity of non-Multi-Stage Generating Resources that are eligible and elect to use the Registered Cost methodology in accordance with Section 30.4 will be limited to 150% percent of the Projected Proxy Cost. The maximum Start-Up Cost and Minimum Load Cost values registered in the Master File by Scheduling Coordinators for capacity of Multi-Stage Generating Resources that are eligible and elect to use the Registered Cost methodology in accordance with Section 30.4 will be limited to 150 percent of the Projected Proxy Cost for each MSG Configuration of the resources. The Projected Proxy Cost for natural gas-fired resources will include a gas price component, a major maintenance expense component, if available, a volumetric Grid Management Charge component, and, if eligible, a projected Greenhouse Gas Allowance Price component calculated as set forth in this Section 39.6.1.6. The Projected Proxy Cost for non-natural gas-fired resources will be based on costs provided to the CAISO pursuant to Section 30.4.1.1.2, a major maintenance expense component, if available, a volumetric Grid Management Charge component, and, if eligible, a projected Greenhouse Gas Allowance Price component calculated as set forth in this Section 39.6.1.6.

\* \* \*

**39.6.1.7 Maximum Transition Cost Values**

Scheduling Coordinators for capacity of Multi-Stage Generating Resources that are eligible and elect to use the Registered Cost methodology in accordance with Section 30.4 must register Transition Costs for each feasible transition between a lower MSG Configuration and a higher MSG Configuration, between zero and a maximum of 150% of the difference between the Projected Proxy Cost for the Start-Up Costs for the higher MSG Configuration, minus the Projected Proxy Cost for the Start-Up Costs for the lower MSG Configuration. If the result of this calculation is negative for any transition between two MSG Configurations, then the associated Transition Cost shall be zero.

\* \* \*

**40.6.4.1 Registration of Use-Limited Resources**

Hydroelectric Generating Units, Proxy Demand Resources, Reliability Demand Response Resources, and Participating Load, including Pumping Load, are deemed to be Use-Limited Resources for purposes of

Formatted: Left

Formatted: Highlight

Six Cities' Comments on the April 16, 2015 Draft

~~this Section 40 and are not required to submit the application described in this Section 40.6.4.1.~~

~~Scheduling Coordinators for other Use Limited Resources must provide the CAISO an application in the form specified on the CAISO Website requesting registration of a specifically identified resource as a Use Limited Resource. This application shall include specific operating data and supporting documentation including, but not limited to:~~

- ~~(1) a detailed explanation of why the resource is subject to operating limitations;~~
- ~~(2) historical data to show attainable MWhs for each 24-hour period during the preceding year, including, as applicable, environmental restrictions for NOx, SOx, or other factors;~~
- ~~and~~
- ~~(3) further data or other information as may be requested by the CAISO to understand the operating characteristics of the unit.~~

~~Within five (5) Business Days after receipt of the application, the CAISO will respond to the Scheduling Coordinator as to whether or not the CAISO agrees that the facility is eligible to be a Use Limited Resource. If the CAISO determines the facility is not a Use Limited Resource, the Scheduling Coordinator may challenge that determination in accordance with the CAISO ADR Procedures.~~

\*\*\*

**Appendix A**

**Master Definition Supplement**

\*\*\*

**- MSG Transition**

A feasible operation from one MSG Configuration to another as registered in the Transition Matrix associated with a specific Transition Time and a specific Transition Cost, if applicable.

\*\*\*

**- Transition Cost**

For a Multi-Stage Generating Resources, the dollar cost per feasible transition ~~from associated with~~ a given MSG Configuration to a higher MSG Configuration when the resource is already On as registered in the Transition Matrix. Transition Cost must be non-negative.

\*\*\*

Six Cities' Comments on the April 16, 2015 Draft

**- Use-Limited CapacityResource**

Capacity with limitations or restrictions on its operation established by statute, regulation, ordinance, court order, or design considerations that cannot be optimized by the appropriate CAISO commitment process~~A resource that, due to design considerations, environmental restrictions on operations, cyclical requirements, such as the need to recharge or refill, or other non-economic reasons, is unable to operate continuously.~~ This definition is not limited to capacity of Resource Adequacy Resources. ~~A-Use-Limited CapacityResource~~ of a resource that is a Resource Adequacy Resource must also ~~meet the definition of~~ comply with all applicable ~~-Resource Adequacy Resource~~ tariff provisions.