

Submitted By	Company	Date Submitted
Brian Theaker	NRG Energy, Inc. (“NRG’)	March 2, 2016

NRG submits comments on the following topics:

- **Limitations that qualify a unit as “use-limited”.**

The CAISO Draft Final Proposal (DFP) offers this with regards to what qualifies as a “use-limit”:

Limitations accepted by the ISO must originate from restrictions imposed by external regulatory bodies, legislation, or courts, or due to the design of the resource. They cannot be purely contractual, such as a monthly start limitation that is well below any binding environmental limit, based on economic decisions such as staffing requirements or maintenance cost tradeoffs (e.g., to avoid catastrophic maintenance events), or due to fuel intermittency (e.g., wind and solar without storage). (DFP at 12)

TABLE 1 NON-EXHAUSTIVE LIST OF ACCEPTABLE RESTRICTIONS

Acceptable?	Source	Non-exhaustive list of examples
Yes	Statutes, regulations, other ordinances, or court order	<ul style="list-style-type: none"> • Such as from Air Quality Management Districts, California Energy Commission, Local Regulatory Authorities, etc. <ul style="list-style-type: none"> ○ This limitation is largely environmental and most commonly in the form of an air permit. For example, emissions limitations with an absolute limit (cannot pay to emit more and would incur a penalty), wildlife/natural resource management, etc.
	Design	<ul style="list-style-type: none"> • Limited due to the actual design of the resource. <ul style="list-style-type: none"> ○ This limitation is largely applicable to hydro, pumped storage, and in some cases CHP. For example, limited reservoir storage capacity or restrictions documented in OEM recommendations, etc.
Yes – limited	Contractual	<ul style="list-style-type: none"> • Limitations temporarily approved through a regulatory process which meets the criteria set forth in the provisions. <ul style="list-style-type: none"> ○ Additional documentation requirements will be applied ○ Accepted for up to three years following first year of effective opportunity costs.
No	Contractual	<ul style="list-style-type: none"> • Limitations based on a power purchasing or tolling agreements that do not meet the provisional grandfathering criteria
	Economic	<ul style="list-style-type: none"> • To reduce wear and tear • Staffing constraints or lack of investment • Avoid purchasing more compliance instruments (credits, allowances, etc.) to manage emissions (e.g., South Coast Air Quality Management District allows purchase of additional permits rather than a strict limit)
	Fuel intermittency	<ul style="list-style-type: none"> • Variable energy resource <ul style="list-style-type: none"> ○ Such as wind and solar without storage, geothermal ○ Non-linked run-of-river hydro resources

(DFP at 13)

The CAISO has also proposed to allow scheduling coordinators to submit two sets of Master File characteristics – one reflecting “absolute” capabilities and another that reflects the prudent use of

engineering judgment in managing wear and tear. NRG supports that proposal and comments on this proposal below.

- **Treatment of Contractual Limits**

Fearing the exercise of market power through operating limits in negotiated contracts (despite the fact that the contract has been negotiated between two parties with different interests), the CAISO has objected to such mutually-agreed-upon contractual limitations being categorized as “use limitations”. Nevertheless, the CAISO has proposed to allow such contractual limitations as use limitations for a three-year period:

Conventional resources that, as of January 1, 2015, are on an original long-term contract individually reviewed and approved through a comprehensive regulatory process as a new build which evaluated cost implications on rate payers with a limitation on starts, run-hours, or output, will be eligible for an opportunity cost reflective of such limitation, provided sufficient supporting documentation is provided, for up to three years following the effectiveness date of opportunity costs as determined through CCE3. (DFP at 18)

NRG appreciates that the CAISO has agreed to allow for exemptions for contractual limitations. However, limiting the applicability of these limitations to a three-year period in an effort to force the parties to renegotiate these limits imposes an undue burden on market participants. The CAISO carefully has tried to avoid interfering in contractual issues, but this proposal puts the CAISO squarely in the role of requiring changes to a contract to which it is not a party. NRG urges the CAISO to recognize that the limits in such contracts were negotiated in good faith to the benefit of the competing interests of both parties, and to respect those limits without imposing a three-year limit.

- **Feedback on whether a resource is use-limited**

The CAISO offers this with regards to the timing of the CAISO notifying the market participant with regards to whether a unit is use-limited:

The ISO will continue to require documentation of the eligible limits. Because scheduling coordinators will get prompt feedback on whether the resource is use-limited or not, the ISO will be eliminating the five- business day response time. (DFP at 21)

If the CAISO will be providing “prompt” feedback – why it is necessary to eliminate the five business day response time?

- **Translating use limits into starts, hour or MWh limitations:**

The DFP includes this narrative with regards to scheduling coordinators translating certain use limits that may not directly deal with starts, run hours or MWh into start, run hour or MWh use limits:

Some limitations may not explicitly be a limit on the quantity of starts, run-hours, and/or output but rather in terms of emissions, fuel usage, etc. It is the ISOs understanding that some of these limitations can be translated into a limit on starts, run-hours, and/or output, but may not be a simple translation. For example, emissions may differ at start-up and vary across the operating range of the resource. Scheduling coordinators of these resources have the expertise and knowledge on how they operate most efficiently within their current limitations. Therefore the ISO proposes that market participants translate such limitations into a limit on starts, run-hours, and/or output if possible, and submit the translated limitations to the ISO on the use-plan. When a limitation is translated into a limit on starts, run-hours, and/or output, the market participant will also provide the ISO documentation summarizing the methodology used to translate the limitations. The ISO will verify the methodology used to translate the limitations from those stated in the supporting documentation is reasonable and results in the limitations identified. (DFP at 24)

NRG hopes this to be a reasonable approach. Whether it actually is a reasonable approach will depend on the CAISO's requirements for documentation and the follow-up process where the CAISO has questions about the translation.

The CAISO holds that some limitations may be too complex to model:

Limitations that the ISO determines cannot be modeled will be eligible to request a negotiated opportunity cost. Based on conversations with scheduling coordinators, many hydro, participating load, and pumped storage resources develop costs based on sophisticated models that synthesize the impact of current and projected hydrology data, including snowpack levels, watershed topology and size, and various fish and wildlife restrictions. The ISO will not be able to replicate such a model. Instead, the ISO expects the scheduling coordinator to provide the opportunity cost(s) and documentation of the modeling methodology for calculating the opportunity cost(s). The resource will then use negotiated opportunity cost adders as approved by the ISO based on the submitted methodology. The ISO expects that more complicated environmental permits (e.g., Delta Dispatch), as well as multi-stage generators with use limitations, may also require negotiated opportunity costs. (DFP at 26)

NRG agrees that Delta Dispatch warrants the use of a negotiated opportunity cost. However, as noted below, NRG does not support limiting a market participant's opportunity to negotiate an opportunity cost to situations in which a constraint cannot be modeled.

- **Opportunity Cost Model Assumptions**

With regards to the assumptions in the opportunity cost model:

The ISO proposes to simulate the energy prices by first scaling the implied heat rate by a conversion factor based on future power prices and then multiplying the scaled implied

*heat rate by the sum of: (1) the most recent natural gas future prices for the applicable month; (2) the most recent gas transportation costs; and (3) the most recent greenhouse gas costs multiplied by the standard emissions rate. **Using an implied heat rate from the previous time period scaled by a conversion factor based on power prices to simulate energy prices assumes that (1) real time volatility and congestion patterns from the previous year will materialize in the modeled year, and (2) the average nodal LMPs, adjusted for gas and GHG costs, will remain consistent year over year while capturing anticipated changes in both natural gas and energy market conditions. (DFP at 30)***

NRG questions that assumption. The continued build-out of renewable resources will have an effect on future LMPs that cannot be captured merely by accounting for GHG (assumed to be carbon) and gas costs. While it seems likely that the renewable build out will not have a detrimental impact on the opportunity cost calculation – the build-out will serve to lower prices; if the CAISO does not account for the effect of the build-out on prices, while the resulting opportunity costs likely will be too high, not too low – it will have an impact.

- **Dispute Resolution**

In the DFP, the CAISO included this response to comments NRG had raised earlier:

NRG asked the ISO to consider two scenarios which would warrant a resource with a calculated opportunity cost to dispute the value. The first being the scheduling coordinator has a differing view of the future gas prices than those used in the opportunity cost model. The methodology used to estimate the LMPs in the model take into account industry wide indices and reflect anticipated market conditions in both the energy and natural gas markets. Therefore the ISO does not see a need to allow scheduling coordinators to request a negotiated value under this scenario. If estimated LMPs are continuing to under or over-value actual LMPs, this would be a candidate area for potential future enhancements. The second scenario is where the scheduling coordinator has differing views on how the resource should be operated to reduce wear and tear. In Section 11, the ISO is proposing market based Masterfile resource characteristics which are intended to allow the scheduling coordinator to reflect preferred operating parameters of the resource. In addition, a scheduling coordinator may request a Major Maintenance Adder (MMA) in a resource's commitment costs to help manage the preferred operation of the resource to reduce wear and tear. (DFP at 6)

Indices of future energy prices and gas prices reflect certain parties' (not universal) views and assumptions about future conditions. Market participants' expectations about future conditions may or may not align with these forecasts. Given that the CAISO is proposing market participants to request negotiated opportunity cost adders if the market participant "...does not agree with the CAISO's calculated opportunity cost..." and "...there is sufficient justification for why the calculated opportunity cost is not effective...", the CAISO should accept requests to

negotiate opportunity costs where those requests are based on views of future conditions that differ from the CAISO's, especially if the differing views result in opportunity costs that the market participant does not feel are high enough.

The CAISO offers the following with regards to resolving disputes with regards to its calculation of opportunity costs:

In the event a scheduling coordinator with a resource identified as having limitations that can be modeled does not agree with the ISO's calculated opportunity cost, the scheduling coordinator can submit a request to the ISO to obtain a negotiated opportunity cost. The ISO will work with the market participant to reach a negotiated contract if there is sufficient justification for why the calculated opportunity cost is not effective. Sufficient justifications include:

- *a significant factor not accounted for in the model that cannot be reasonably modeled, and significantly impacts the calculated opportunity cost.*
- *a RA resource is at risk of not being available for the entirety of its RA showing despite the commitment cost bids reflecting the calculated opportunity cost.*

The ISO will then work with the scheduling coordinator to negotiate an appropriate opportunity cost with sufficient justification and supporting documentation from the scheduling coordinator as requested by the ISO.

Similar to the process for a negotiated default energy bid or a negotiated major maintenance adder, if a scheduling coordinator and the CAISO cannot reach mutual agreement on an opportunity cost to be used, the scheduling coordinator may file at FERC pursuant to Section 205 of the Federal Power Act for approval of a rate. (DFP at 36)

Future conditions can be modeled – but parties can reasonably disagree about what those conditions may be. The CAISO should bear in mind that if a resource exhausts its use limits, the market participant associated with that resource, not the CAISO, bears the associated operational, compliance and financial risks. The CAISO should seek to make the development of opportunity costs a collaborative process, not a “take it or file at FERC” process. NRG respectfully urges the CAISO not to narrowly prescribe the conditions under which a market participant can seek to dispute and negotiate the opportunity cost for one of its resources, but to be open to such negotiations under a wide range of conditions.

- **Short-Term Use Limit Reached Outage Card**

In the DFP, the CAISO offered this with regards to retaining the use of the short-term use-limited reached outage card:

The ISO is proposing the short-term use-limited reached outage card will be retained upon implementation of the opportunity cost methodology. This will allow time for the

ISO and scheduling coordinators to become effective in using the opportunity costs in commitment cost bids and address any potential unforeseen issues that may arise. The outage card will serve as a safety net for scheduling coordinators during this period and will aid in a smooth transition away from the outage cards and towards an economic tool to optimize use-limited resources. Excessive use of the outage card will inhibit the ability for the ISO and market participants to ensure the opportunity cost methodology is an effective management tool. Therefore reasonable use of the outage card should primarily be limited to cases where the opportunity cost has been ineffective and the resource is at risk of reaching the limitation prematurely even with bids reflecting the opportunity cost. For example, if a resource adequacy resource is at risk of reaching the limitation before the end of its RA obligation despite utilizing the opportunity cost in commitment cost bids, this card can be used to essentially reserve sufficient starts for the latter portion of the RA period.

The card will remain available to use-limited resources until the ISO deems the opportunity cost methodology an effective economic tool to manage use-limited resources. At that juncture, the ISO will seek to retire the short-term use-limited reached outage card through a tariff amendment filing.

As discussed in more detail below, a primary concern for stakeholders is when a use-limited RA resource reaches its limitation it will no longer be exempt from RAAIM, possibly due to a miscalculated opportunity cost. The ISO will commit to evaluating how well the opportunity cost model rations out the starts over the year, particularly for RA resources. In the event the ISO finds that for certain resources, the opportunity cost is not an effective management tool, the ISO will consider further enhancements to the model or possibly make the short term use-limited reached outage card a permanent tool for those resources. (DFP at 41-42)

NRG strongly supports the CAISO retaining the short-term use limit reached outage card, and exempting resources that use this card from RA non-availability penalties, for an indefinite period of time until the opportunity cost model and associated processes mature into a reliable framework.

The CAISO also proposes that a resource that reaches a use limit will be exempted from RAAIM penalties for the balance of the month, but will be subject to RAAIM beginning at the first day of the next month if the resource does not provide substitute capacity. While the CAISO asserts that the risk of putting a unit in this situation will be mitigated by (1) using 90% of the resource's limit to calculate the resource's opportunity cost and (2) retaining the use of the short-term use-limit reached outage card, the effects of subjecting a unit to RAAIM penalties or RA replacement costs because the CAISO-calculated opportunity cost failed to effectively ration the use of that resource is a huge risk. The CAISO must adopt a policy that a resource whose scheduling coordinator has included the CAISO-determined opportunity cost in its bids and whose use limits

have been exhausted will, under no circumstances, be subject to RA replacement costs or RAIM penalties for the balance of the applicable period of the use limit.

NRG acknowledges that the situation in which a scheduling coordinator has not fully incorporated the CAISO-determined opportunity cost into its bids and has reached its use limit is a more complex situation that likely cannot be fully addressed by a blanket exemption from replacement costs or penalties.

- **Design and Market Characteristics**

The CAISO proposes to allow for two sets of Master File characteristics: (1) design and (2) market. The design characteristics reflect the unit's maximum capable performance and would be used in system emergencies. The market characteristics would reflect some engineering judgment as to acceptable wear and tear on the unit, taking the unit's technology and vintage into account. "Market" Master File characteristics would apply to only three unit parameters: (1) maximum daily starts; (2) maximum MSG transitions and (3) ramp rates.

The CAISO expressed concern that allowing units to specify a market parameter of a single start a day could resort in gaming and the exercise of market power. The CAISO noted that Flexible Category 1 (Base Ramping) resources must be able to provide at least two starts per day. ("This would translate to a minimum of two starts per day for Flexible Category 1 resources and a minimum of one start per day for all others." – DFP at 45) However, Section 40.10.3.2 (a)(4) allows a resource to be a Base Ramping Resource if it can "...provide the minimum of (i) two Start-Ups per day for every day of the month or sixty Start-Ups per month, or (ii) the number of Start-Ups allowed by its operational limits, including minimum up and minimum down time..."

The CAISO continues:

Therefore the ISO is now proposing the market based maximum daily start values be, at a minimum, two starts per day except in the event the design capability value for maximum daily starts is one start per day or under the limited exception as noted below. If the design capability of the resource is one start per day, the market based value can then be one start per day.

The ISO understands resources nearing the end of its life cycle may warrant the resource only starting once per day despite its design capabilities allowing it to start more than once per day. The scheduling coordinator may request the ISO extend this exception of allowing one start per day in the market based max daily start field with sufficient justification. The request being made must include a detailed explanation of the mechanical justification for why the resource cannot start more than once per day, including the vintage of the resource. Per the ISO's discretion, upon receipt of such a request and review of documentation provided, the ISO may grant the exception. The scheduling coordinator must also provide additional explanation and/or documentation

per ISO request if needed. Review of an ISO denial of an exception request would be subject to the ISO tariff alternative dispute provisions. (DFP at 46)

NRG requests that the CAISO:

- (1) Clarify that a resource may list a single start per day rather than a minimum of two starts per day if the resource's operating characteristics (e.g., minimum up and down time) would limit it to a single start per day. This would be consistent with the existing definition of a Base Ramping Resource.
- (2) Provide some additional guidance as what characteristics or conditions would allow (or not allow) a resource to provide a single daily start as a market master file characteristic.