Commitment Cost Enhancements
Policy Clarification

Straw Proposal

December 6, 2019

Market & Infrastructure Policy

Table of Contents

1. Introduction

The purpose of this straw proposal is to clarify policy discussed in the third phase of the commitment cost enhancements (CCE3) initiative and to clearly reflect those clarifications in the ISO tariff. These clarifications are focused on use limited and conditionally available resources. This paper also includes a discussion of run-of-river hydro resources, offers a new definition for these resources to be included in the tariff, and proposes that they be exempt from the resource adequacy availability incentive mechanism (RAAIM). The paper goes into detail about bidding obligations, notification of outage requirements to the ISO, and RAAIM obligations for these resources.

The principle driver in the commitment costs enhancement initiative was to allow for expanded market participation from all use limited resources, including the hydro fleet. Market rule changes that facilitate more frequent participation of these resources in the ISO market allows for greater system flexibility, increased competition, and more efficient market outcomes.

The ISO published similar tariff clarifications on September 26, 2019 and hosted a stakeholder call to discuss the changes on October 10. During the stakeholder call, in written comments in response to the call, and after the call stakeholders voiced significant concern about the changes outlined in the tariff clarifications. The ISO agreed to open a formal stakeholder process to discuss these issues and think about potential solutions that could accommodate most resources on the California system. Specifically, Southern California Edison (SCE) requested that the ISO review the counting methodology for hydro resources. Although this methodology is outside of ISO purview, the ISO discusses the possibility of supporting these changes at the California Public Utilities Commission (CPUC) where these rules are set.

This ISO will publish this document on December 6, along with an accompanying proposal from SCE. The ISO will host a teleconference call following publication, on December 10. There will be a window for any comments or clarifications open until January 6, which has additional time built in to accommodate the holidays. The ISO will prepare and post a draft final proposal following the comment window in January, followed by a stakeholder call. The ISO plans to take this policy to the ISO Board of Governors meeting in March 2020.

2. Background

Use limited resources

The third phase of the commitment costs enhancements initiative formulated a new definition for use limited resources that could be applied to most resources operating with specific use limitations on the ISO grid.[1] A use limited resource does not have the ability to start or run indefinitely and these restrictions on usage could be the result of regulatory restrictions or facility design limitations. For example, a gas resource may have an air permit that only allows the resource to start a particular number of times per year, or a hydro resource may have a certain amount of water stored and can only produce a certain amount of energy (MWh) with the limited amount of water available.

Use limitations create an interesting challenge for ISO market design. The principle market design allows resource owners to bid true costs into the market. The market then generates a least cost solution to operate the grid given expected conditions. This process leads to an elegant solution where least cost resources are dispatched first before more expensive units when solving for system needs. If use limited resources only include fuel costs in their bids, *i.e.*, their bids do not include the *opportunity cost* of using one of the resource's limited starts or run hours, these resources could quickly reach their use limitation even though the resource may have been more valuable for system operations later in the month or year.[2] This issue can be particularly problematic for hydro resources because their marginal cost, without accounting for opportunity costs, is generally very low.

Opportunity costs capture the idea that if a resource starts or runs now, it may be unable to do so in the future because of a use limitation. The ISO's opportunity cost adders measure how much the resource is giving up if it should run at a sub-optimal time. For example, if a hydro resource has enough water stored to only run for three hours per day, and the expected energy prices for the top three hours are $70/MWh, $60/MWh and $55/MWh, then the opportunity cost for the resource to run would be

---

[1] ISO completed and closed stakeholder initiatives: http://www.caiso.com/informed/Pages/StakeholderProcesses/CompletedClosedStakeholderInitiatives/Default.aspx.

[2] The market could potentially internalize these costs, if the market were expanded and run for a longer time horizon. In addition to monthly and annual limitations, many resources on the system have daily limitations. These limitations are considered by the market model, which optimizes use given all of the market constraints, including daily use limitations, when calculating dispatch instruction and market results.

$55/MWh, or the revenue that the resource would give up if it ran at an earlier time. The same resource may incur an actual cost of $5/MWh when generating.[3] If the resource is bid into the market at $5/MWh cost, it may be dispatched very early in the day, and would not have any water available to serve load later in the day when the prices (and system needs for energy) are highest.

There are ways for a use limited resource to manage this issue on its own. A resource might elect to self-schedule energy into the market only during the times it expects prices to be highest, or it could bid into the market at extremely high prices during the periods it expects that market prices will be low so that the ISO does not exhaust the use limitations prematurely. These approaches to managing use limitations are imperfect from the perspective of both market-wide efficiency and the resource's self-interests. If the resource self-schedules into the market, then the ISO loses all flexibility from the resource. Resource flexibility is becoming more critical as net load ramps and load and generation forecasting uncertainty continue to increase year over year with the increase of solar generation. If the resource bids in at very high prices, it might trigger the market power mitigation process which reduces the resource's bids to their expected cost to run. Further, if the resource takes either of these actions, it may miss capturing market rents during the highest priced hours of the day. These opportunities can be particularly valuable to hydro resources as they are generally fast ramping resources and have the ability to respond quickly to price spikes in the 5-minute market.

An elegant solution to these challenges was outlined in the Commitment Cost Enhancements initiative. Use limited resources are now allowed to include an opportunity cost adder, which is determined by the ISO, in addition to operating costs to set the default energy bids when local market power mitigation is triggered. Further, if resources bid in such a way that included the opportunity cost adders, the resources would be dispatched when prices were above those costs and, therefore, enhance rents earned when additional dispatches were made. This solution allows a use limited resource to bid its capacity into the market during all hours, enabling the ISO to respect the resource's use limitations and dispatch it most efficiently and effectively.

Creating opportunity cost adders also has implications for use-limited resources providing resource adequacy capacity. Units providing resource adequacy capacity generally have a 24x7 must offer obligation. However, use limited resources providing resource adequacy capacity historically only were required to submit bids for periods when their use limitations allowed them to operate. This has been problematic because

[3] These costs might include operations and maintenance costs related to running the resource and grid management charges.

use-limited resources are a growing percentage of the resource adequacy fleet and they may not be available to meet ISO reliability needs when and where needed. Specifically, use-limited resources that were hydroelectric, pumping load, and non-dispatchable use-limited resources that provided resource adequacy capacity had to bid "their expected available Energy or their expected as-available Energy" into the market, while all other types of use-limited resources that had to bid into the market where able to do so per the limitations specified in their use plans, which were filed with the ISO.

These units also were exempt from ISO bid generation, but generally were not exempt from RAAIM. To the extent they did not submit bids during RAAIM availability assessment hours, they would be exposed to non-availability charges. Use limited resources did, however, have access to RAAIM exempt outage cards to use in the event that the resource exhausted, or was in danger of exhausting its use limitations.[4]

Conditionally available resources

The commitment cost enhancements initiative narrowed the scope of units that could qualify as "use-limited" resources. The initial proposal and filing, however, did not provide clarity about the bidding obligations for the units that were losing use limited status. The existing rules required those resources to bid 24x7, however it was likely that these resources would continue to have difficulty meeting a 24x7 must offer obligation because of the limitations that originally classified the resources as use limited. A question arose if the commitment cost enhancements policy had effectively made these resources ineligible to provide resource adequacy capacity because they could not meet the bidding obligations.

Prior to the commitment costs enhancements policy, the ISO submitted a supplemental tariff filing clarifying this issue.[5] This filing included details that the same must-offer obligation would continue to apply to units that could not qualify as a use-limited resource under the new policy. The ISO also created a new resource category called

[4] This card may be used infrequently because of the design of the opportunity cost adder. The adder is recalculated by the ISO generally on a monthly basis and is updated based on historic use of the limitations facing a resource. For example, if a resource is limited to 100 starts at the beginning of the year and uses 50 in January, the opportunity cost adder is recalculated at a new value considering that there are only 50 starts available for the remainder of the year, prior to February. This should result in a significantly high opportunity cost adder that prevents the resource from running too frequently for the remainder of the year.

[5] The filing was made in FERC docket no. ER19-951-000, filed on April 1, 2019. This filing included changes to tariff section 40.6.4.1.

"conditionally available resource" that would also qualify for the as-available must-offer obligation.

The logic of creating the designation for conditionally available resources was to prevent resource types not covered under the prior version of the must-offer obligation from being ineligible for resource adequacy by implication. One example was a generating unit with a noise permit issue that prohibited it from operating during certain hours of the day. Another was a hydroelectric resource that had limitations on its maximum output that could not be modelled by opportunity cost adders, such as regulatory obligations. There was no intent to create RAAIM exemptions for the resources that could model constraints with the use-limited framework.

Run-of-river resources

Scheduling coordinators representing run-of-river hydro have argued that run-of-river hydro is similar to variable energy resources and should also be exempt from RAAIM as are VERs because their day-to-day operations are very similar. Both resources must estimate how much energy they can produce during each hour, and they often are unable to produce beyond these estimates because of fuel limitations – wind, solar, or river flow. One distinction between run-of-river hydro and VERs is the ISO does not receive forecast data for run-of-river hydro as it does for wind and solar. For this reason, the ISO maintains that run-of-river resources cannot be treated as variable energy resources because of this difference in data availability, but the ISO believes it is appropriate to not subject run-of-river resources to RAAIM for the same reasons variable energy resources are not subject to RAAIM.[6]

Additional hydro considerations

Each hydro resource in California is unique. Some of these resources are relatively simple to model and some are incredibly complex. Complications may include downstream or upstream flow requirements, environmental standards, water rights considerations and linkages with other hydro resources. It follows that models used by scheduling coordinators to optimize these resources may also be complex to the point that it is unrealistic, or potentially impossible, for ISO pricing models to capture the actual requirements for these resources to run. Such resources may not fit into a use

[6] FERC docket no. ER19-951-000 included language that prohibited run-of-river hydro resources from being variable energy resources, and continued to expose them to RAAIM. The Commission's order on this issue rejected the CAISO's amendments but offered no guidance about whether run-of-river hydro should be exempt from RAAIM. Notably, the order provided an incomplete account of the CAISO's initial rationale for the RAAIM exemption and did not address the arguments made for expanding the exemption to run-of-river hydro.

limited model. Further, if these resources were shown for full capacity in the resource adequacy process, they may be exposed to considerable financial penalties through the RAAIM mechanism when conditions prevent the resource from offering its full capacity into the market. These concerns can arise even within the construct of the use limited default energy bid adders.

SCE proposed a methodology to assign capacity values to hydro resources with storage.[7] The ISO would like to use this stakeholder process to further vet this proposal, and other potential proposals for hydro resources. This methodology aligns with the unforced capacity (UCAP) counting construct that is currently being discussed in the ISO's resource adequacy enhancements stakeholder initiative. If such a counting methodology is approved and adopted by the CPUC to determine capacity values for hydro resources, it may be appropriate for hydro resources to elect either the proposed or existing counting methodology for resource adequacy.

Resources that elect the new methodology would be exempt from RAAIM penalties but may count for less capacity, while resources that elect the traditional counting methodology would still be subject to RAAIM but may qualify for capacity in excess of the proposed methodology. Hydro resources selecting the new methodology would now have an incentive to make their capacity available because any reduction in availability today would result in lower qualifying capacity values over the next three years. This would limit a resource owner's ability to show or sell resource adequacy in the future. Because of this incentive, it would be unnecessary to subject these resources to RAAIM, and this treatment would be similar to existing methodologies for other variable output resources on the system today.

Local capacity

Since the commitment cost enhancements initiative, the ISO has learned more about stakeholders concerns regarding showings for resource adequacy capacity in local areas. One concern is that local area requirements are set at peak (August) monthly requirements for each local area for all twelve months. One potential method for addressing this problem is with the use of planned outage cards, which are available for use by all resources, including hydro. Planned outage cards must be approved by the ISO, but during particular times of the year when loads and the need for capacity is lower, resources that are shown for resource adequacy may be approved for planned outages. These outages may reflect reduced availability of hydro resources during some

[7] http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=B5B06724-4A68-4214-86DA-02647EAFFAC0.

months, or specific date ranges when historic hydro generation is low. Generally, less planned outages are approved during the periods of the year when loads are highest, as there is generally little residual capacity available at this time.

3. Proposal

3.1 Conditionally Available Resources

The commitment cost enhancements policy allows resources with legitimate operational or regulatory limitations to register as use-limited resources and utilize opportunity costs to manage their use limitations. The ISO created conditionally available resources to fill a policy gap for certain resources that could not always operate at their full operating range due to certain limitations that the ISO could not model and resolve through its market optimization. If non-dispatchable resources, hydro, or pumping load face limitations that cannot be captured through the ISO's opportunity cost modeling, they can seek conditionally available resource status.

When a conditionally available resource is unable to offer into the market because of conditionally available limitations, the ISO expects that the resource's scheduling coordinator will reflect that reduced availability through an outage ticket submitted to the ISO through the outage management system. This obligation to report reductions in maximum output capability is a generally applicable requirement for all resources in the ISO market.[8]

A resource can potentially be both a use-limited resource and a conditionally available resource. Resources with both designations will be permitted to submit outage cards available to both designations.

However, the underlying limitations that qualify the resource for each of these designations cannot be the same. One of the criteria for use-limited status is that the limitation does not restrict the hours of operation of the resource, and that the resource limitation usage needs to be rationed over a fixed period of time. If the resource has one or more operational or regulatory limits that do not qualify as use limitations, but still impose frequent and recurring periods of unavailability, the resource may apply for conditionally available status.

Resources with both designations will be permitted to submit outage cards available to both designations. For example, a gas resource with an air permit limiting its annual

[8] Section 9.3.10.3.1.

starts and a noise permit restricting its availability in certain hours of the day can register the air permit limitation for use-limited status, and register the noise permit limitation for a conditionally available status.[9]

Scheduling coordinators are responsible for submitting the appropriate outage card when conditions arise that prevent the full dispatch of the resource. In the above example, if a resource is both use-limited and conditionally available, the resource may enter an outage card reserved for use-limited resources if the reduced availability is driven specifically by a use limit that justified its use-limited resource status. This is consistent with existing rules for resources submitting outages, in that outage cards need to reflect actual conditions limiting or preventing a resource from participating in the market.

3.2 RAAIM Application

The CAISO did not intend any unique RAAIM treatment for conditionally available resources. The policy intent was for these resources to be assessed RAAIM based on their full resource adequacy capacity – not their conditionally available capacity – during the availability assessment hours. That is, a conditionally available resource that is shown for 100 MW of RA capacity may only be available for 20 MW at a particular time because of the regulatory limit that it cited to qualify for conditionally available status. The intent was for RAAIM calculations be based on the 100 MW of shown capacity, rather than the 20 MW of availability due to conditional limitations.

As an interim measure, the ISO allowed use of the RAAIM-exempt outage card for certain resources.[10] Use of this outage card was temporary and, pending the clarifications in this proposal, will no longer be allowed. As a result of these changes, the must-offer obligation and RAAIM exposure may not align for conditionally available resources during some hours.

To create a more durable solution, the CAISO will further explore how resources with uncertain availability should establish net qualifying capacity (NQC) values. The effective load carrying capacity (ELCC) methodology addresses this for wind and solar, and CAISO will continue to refine methods for other resource types, including hydro and hybrid resources. This process will involve more in-depth stakeholder engagement and coordination with the CPUC and other LRAs.

[9] For purposes of opportunity cost calculation, only the air permit limitation will be considered.

[10] These changes were made in PRRs 1168, 1169, and 1170.

3.3 Run-of-River Hydro

The output from run-of-river hydro is variable in some of the same ways as wind and solar resources. Wind and solar resources are required to bid into the market at their expected energy output, have limited control on their maximum output, and are not subject to RAAIM. The CAISO finds that run-of-river resources should be treated in a similar fashion.

Run-of-river resources have very limited control of their output from one interval to the next. For example, a run-of-river hydro resource with a maximum output of 10 MW may be capable of producing anywhere between 0 MW and 7 MW given current flow conditions. In the next interval, the resource may only be capable of producing between 0 MW and 3 MW based on existing flows. The resource producing at any point in the range of 0 MW and 7 MW during the earlier interval generally has no impact on the resource's output capability of between 0 MW and 3 MW in the next interval.

The ISO expects that run of river hydro resources will generally act as price takers and offer all generation capability into the market. Generally, when there is water available, the resource will generate and earn market revenues, and when water is not available, the resource will not generate. These resources can generally respond to ISO dispatches to reduce energy output below the maximum possible allowed by current hydro flow conditions. The ISO often experiences low or even negative prices during spring months when solar is online, hydro generation is high, and loads are relatively low. During periods with negative prices, these resources may choose to 'spill' (not run) and forego negative revenue (charges) for generating energy not needed.

Run-of-river hydro resources are similar in nature to variable energy resources (VERs). Variable energy resources, such as wind and solar resources, are also generally considered price takers, in that when the wind is blowing or the sun is shining they produce energy and sell it into the market. These resources may also have technology to allow reduction from maximum output in response to ISO dispatch instructions. These resources are required to bid into the market at their expected energy output, and bid flexibility in the downward direction if possible. Like VERs, run-of-river hydro resources are allowed to count for net qualifying capacity in the resource adequacy process, but do not count for their full nameplate capacity. Capacity for these resources is derated based on historical performance, in a similar way to how VER NQC is set using the effective load carrying capacity (ELCC) methodology. As with wind and solar, a run-of-river unit's poor performance in the past will reduce its QC value in the future. This creates an incentive, independent of RAAIM, for run-of-river resources to maximize their performance.

These factors are significant enough to qualify run-of-river resources for a RAAIM exemption. The ISO proposes new tariff language to define run-of-river hydro resources as RAAIM exempt. Run-of-river resources providing resource adequacy capacity will not, by default, have a unique must-offer obligation. They may, however, apply for status as a conditionally available resource, in which case they would be eligible for the expected energy must-offer obligation.

Similar to some wind and solar resources, run-of-river resources may also be shown as flexible resource adequacy. This is acceptable when these resources can curtail output when generating and can consistently bid their flexibility into the market.

In defining run-of-river, the CAISO must address two issues: (1) how much pondage should disqualify a resource from being run-of-river; and (2) how should the CAISO account for cases where the operator of a run-of-river resource also controls releases from a reservoir directly upriver that materially impact the generator's operation.

Pond storage

The distinguishing feature of run-of-river compared to other hydro is that electricity production from run-of-river at one point in time does not influence its generation capability at a later point. If a reservoir-backed hydro resource does not release water now to generate electricity, then it will have more water with which to generate electricity later.

This distinction, however, is not as simple as defining run-of-river as a hydro resource with no storage capability. The ISO understands all resources commonly thought of as run-of-river have some level of water storage. A minimal amount of storage is necessary to generate sufficient water pressure to operate the generating unit. Once the pond is large enough to "store energy" and permit the resource to make a trade-off between generating now or generating later, then the element of inherent variability is lost and the resource does not qualify as run-of-river.

Common control of water system

A second issue is run-of-river resources are often part of a larger hydro system with multiple reservoir-backed hydro resources under the same operator's control. Where the operator of a run-of-river unit also controls water releases from a reservoir directly upriver, then there is a question as to whether the run-of-river operator actually lacks control over the unit's output. The CAISO sees this as a legitimate concern but has concluded that trying to accommodate it by defining a run-of-river resource or by creating a RAAIM exemption raises too many additional complications.

First, it would be difficult to define any generating resource based on the characteristics of a separate resource. For example, if a reservoir-backed hydro resource upriver changes ownership, would that change whether the downstream resources under a different owner still qualifies as run-of-river? The CAISO found it would raise too many other questions to allow run-of-river to be defined based on the ownership and operating characteristics of upstream, reservoir-backed generating units.

Second, the common operator of the run-of-river and reservoir-backed hydro units may not always have control over when it must release water from the reservoir. Sometimes the operator may hold regulatory requirements to release water from the reservoir. Also, it would not necessarily control the flow of water into the reservoir. If it must release water because there is too much water flowing into the reservoir from natural waterways, then the release of water that influenced the generating output on the run-of-river unit arguably is beyond the operator's control.

The CAISO does not believe it can administer a RAAIM exemption that accounts for these varied scenarios. The CAISO will not seek to define run-of-river hydro or determine its RAAIM exemption based on what other resources the operator of a given run-of-river resource may control.

Proposed run-of-river definition

Based on these considerations, the ISO proposes the following definition for run-of-river hydro.[11]

> "A hydroelectric Generating Unit that has no physical ability to control or store its fuel source for generation beyond whatever pondage is necessary to maintain sufficient water pressure to operate the Generating Unit."

Net qualifying capacity

Similar to solar and wind resources, run-of river hydro resource can be beneficial to the system and help to ensure reliable operations. They can also reduce the needs to procure other resource adequacy resources to meet these needs. The ISO uses net qualifying capacity as an upper bound for the amount of capacity that resources can be shown for in the resource adequacy construct. The ISO will continue discussing how the net qualifying capacity for run-of-river hydro resources should be set to ensure they do

[11] The CAISO considered the definitions from other ISOs/RTOs but did not find these met its specific needs. The New York ISO defines a "Limited Control Run-of-River Hydro Resource" as "A Generator above 1 MW in size that has demonstrated to the satisfaction of the ISO that its Energy production depends directly on river flows over which it has limited control and that such dependence precludes accurate prediction of the facility's real-time output."

not qualify for more capacity than they can reasonably provide to maintain system reliability.

3.4 Hydro Resource Counting Rules

Each hydro resource in California is unique. Some of these resources are relatively simple to model and some are incredibly complex. Complications may include downstream or upstream flow requirements, environmental standards, water rights considerations and linkages with other hydro resources. It follows that models used by scheduling coordinators to optimize these resources may also be complex to the point that it is unrealistic, or potentially impossible, for ISO pricing models to capture the actual requirements for these resources to run. Such resources may not fit a use limited model. Further, if these resources were shown for full capacity in the resource adequacy process, they may be exposed to considerable financial penalties from the RAAIM mechanism. These concerns can arise even within the construct of the use limited default energy bid adders.

SCE proposed a methodology to assign capacity values to hydro resources with storage. The ISO would like to use this stakeholder process to vet this proposal and other potential proposals for hydro resource counting rules. If such a counting methodology is approved and adopted by the CPUC as a way to determine capacity values for hydro resources, it may be appropriate for hydro resources to elect either the proposed or existing counting methodology for resource adequacy. Resources that adopt the new methodology would be exempt from RAAIM penalties but may count for less capacity, but resource with the traditional counting methodology would still be subject to RAAIM but may qualify for capacity in excess of the proposed methodology.

The first option for the proposed hydro counting methodology submitted by SCE has certain advantages. First, resources would be incentivized to bid as much capacity into the energy market as possible. This is because the calculation for capacity is dependent on historic availability of the resource, and decreasing availability has a direct impact on future capacity value. Additionally, this allows load serving entities to show the full available capacity for a hydro resource in the resource adequacy model, where the available capacity is calculated based on past resource availability. This reduces the financial exposure for these resources, as they will no longer be subject to RAAIM. This is critical for particularly complex hydro resources that may not have the ability to generate at the full range of output during specific times due to constraints on water usage. Further, the capacity value calculated can have seasonal values that vary based on operation and expectations of availability for the hydro fleet. This shaping will also

help load serving entities more accurately apply expected available capacity to the requirements during the year.

The ISO is concerned about removing the existing capacity counting methodology for all hydro resources on the system today. Existing capacity counting rules and RAAIM requirements may be preferable for some hydro resources. Specifically, a large stand-alone hydro resource with a significant amount of storage may find the existing rules regarding capacity counting preferable, as such a resource may generally be able to bid its full capacity range into the market nearly all hours of the day. The opportunity cost adder, regulating the total amount of energy generated, can be included in bids and prevents the resource from exceeding its available water supply.

If a resource elected to continue to use the existing rules for setting capacity, they would continue to be subject to RAAIM penalties, and would be eligible to use limited default energy bids. Resources that elect the new accounting methodology would be ineligible to receive adders on their default energy bids, and would be required to manage any use limitations for a resource with outage cards, in addition to other water constraints.

The ISO does not control how resource adequacy counting is applied within the resource adequacy program. This is overseen by the CPUC, and any changes need to be approved by the CPUC. The ISO is willing to collaborate with load serving entities to promote such counting methodologies at the CPUC and have them approved and implemented as quickly as possible.

Counting Methodology

SCE proposed a hydro counting methodology that would include a weighted average of the availability for the resource during the three most recent years. A weight of 50% would be applied to the most recent year, a weight of 30% would be applied to the second most recent year, and a weight of 20% would be applied to the third most recent year. This can be expressed algebraically as follows:

$$Capacity_y = .5 * Avaialbvility_{y-1} + .3 * Avaialbvility_{y-2} + .2 * Avaialbvility_{y-3}$$

This would be calculated for each year *y*, for summer months (May-September) and for non-summer months (all others).

If such a methodology is adopted, the ISO would propose a formulation that is more representative of a year with low hydro availability. This would provide a reasonable expectation of resource availability given potential impacts to reliability if overly optimistic availability assumptions are made. With that objective in mind, one approach

is to place additional weight on a historic year with lower availability. This is illustrated in the following formulation:

$$Capacity_y = .5 * Lowest + .5 * Other\ two\ years$$

This formula considers availability from the previous three years, and applies a weight of .5 to the year with the lowest availability and a weight of .5 to the average of the other two years.

Finally, SCE also offers an exceedance methodology as a possible alternate proposal. The ISO does not support this methodology.

3.5 Other Tariff Clarifications

The ISO will also update tariff language regarding how multiple internal resources can provide substitute capacity.[12] The rules for inclusion of external resources as substitute capacity for forced outages will be updated as well.[13]

4. Next Steps

The ISO will host a public stakeholder call on December 10, 2019 beginning at 9:00am. This call will be to review the clarifications outlined in this paper, to discuss possible changes to the CPUC counting methodologies for hydro resources, and associated tariff clarifications. The ISO will allow verbal comments during the call and written comments shortly afterwards so stakeholders can seek additional clarifications. All written comments are required by January, 6. The ISO intends to produce a draft final proposal in January, after the comments period is over for this paper, and have an additional public stakeholder call on January 21. The ISO is planning to take this to the Board of Governors meeting in March.

Comments can be submitted in regard to this paper or the proposed tariff language to: initiativecomments@caiso.com.

[12] The updated language is in section 40.9.3.6.4 (d). Current language is identical to the language in 40.9.3.6.4 (c), which discusses substitution from a single resource, but should not be.

[13] The updated language is in section 40.9.3.6.5(d) of the tariff and will mirror language in section 9.2.3.2 of the Reliability Requirements BPM.