Reliability Services

Straw Proposal

June 5, 2014

Table of Contents

1. Executive summary

The reliability services initiative is a three-phase, multi-year effort to address the ISO's rules and processes surrounding resource adequacy resources. California's resource planners are preparing for unprecedented changes to the bulk power system. Although the current reliability framework has generally provided for reliable operation of the grid, there is an acknowledged gap in future forward procurement processes. This is mostly due to significant and growing amounts of new renewable and preferred resources. This initiative will propose necessary changes to ensure sufficient resources with the right capabilities are available and offered into the ISO markets to meet local, flexible, and system capacity requirements.[1]

The existing resource adequacy framework has developed and evolved over several years in collaboration with the California Public Utilities Commission (CPUC) and the other local regulatory authorities (LRAs). The reliability services initiative will continue with this collaboration and work in conjunction with the CPUC's *Order Instituting Rulemaking to Consider Electric Procurement Policy Refinements* per the *Joint Reliability Plan* (JRP) (CPUC Docket No. R.14-02-001).

The reliability services initiative has three phases. In the first phase the initiative will focus on resource adequacy rules and processes that must be updated quickly for reliability or regulatory reasons. These mostly relate to enhancements to further integrate preferred resources into the grid, rules for the newly determined flexible resource adequacy requirement, and an update to the ISO's backstopping capability, which expires on February 16, 2016.

The second phase will address issues related to mid-range resource adequacy capacity procurement. The ISO has previously identified a gap in resource adequacy planning three to five years into the future. This gap introduces reliability risk, given the rapid change of the resource mix and the specific resource capabilities that will be needed to reliably operate the grid. This phase will focus on how ISO rules need to change to mitigate the risk of uneconomic or disorderly retirement. The specific scope and timing of this phase is dependent on track one of the CPUC's JRP proceeding. In this track, the CPUC is currently evaluating whether and how to move toward a multi-year forward resource adequacy program. The second phase of the reliability services initiative will continue any items from the first phase that involve a longer term effort.

Finally, the third phase of the reliability services initiative will propose a durable construct for flexible resource adequacy. The ISO committed to "initiate a stakeholder process in the first quarter of 2016 to discuss with stakeholders the findings of these ongoing assessments, as well as any recommendations for potential improvements in the flexible capacity categories or

[1] The resource adequacy provisions of the ISO tariff work in conjunction with resource adequacy requirements adopted by the California Public Utilities Commission and other provisions of California law applicable to non-CPUC jurisdictional Load Serving Entities.

process." This phase will also consider other needed rule changes to accommodate a durable flexible resource adequacy structure.

This paper initiates the first phase of the reliability services initiative and is broken into four parts.

Part I describes potential enhancements to resource adequacy criteria and must-offer requirements for preferred resources. As newer technology for producing and delivering energy onto the grid arise, the ISO will have to adapt current resource adequacy rules to a diverse set of resource types. Specifically, the ISO proposes to:

- Enhance the minimum eligibility criteria for system, local, and flexible resource adequacy (RA) capacity where needed, and

- Modify must-offer rules where required, in particular for use-limited resources, in order to standardize must-offer requirements, as is feasible.

The ISO has identified three areas targeted for improvement in the current tariff related to minimum eligibility criteria. These areas deal with distributed generation facilities, non-generation resources, and proxy demand resources. In summary, the ISO proposes to:

- Clarify that a distributed generation facility must be a participating generator or a system resource,

- Evaluate the costs and benefits of maintaining the current 0.5 MW minimum size threshold for eligibility to be a participating generator or a system resource,

- Establish minimum eligibility criteria for non-generator resources, and

- Modify the existing criteria for proxy demand resources in order to more closely align with CPUC criteria.

The ISO finds that the current must-offer rules can be improved by applying them in a more standardized manner, and more universally accessible, across all resource types, including use-limited resources. The ISO also has determined that must-offer obligations for distributed generation facilities and non-generating resources require additional clarification. The must-offer rules should align with the eligibility criteria.

Part 2 proposes a new incentive mechanism for RA capacity to participate in the ISO energy market. The current standard capacity product (SCP) incentive mechanism is not easily adaptable to flexible RA capacity or the increasing amount of non-traditional resource types on the grid.

In order to better accommodate preferred and use-limited resources and account for flexible must-offer requirements, the ISO proposes three main design features to the new available incentive mechanism. It should:

- Calculate availability based on the resource bids into the energy market because using a bid-based availability assessment will both account for varying flexible must-offer obligations and better calculate availability for use-limited resources,

- Assess this bid-based availability against a fixed percentage in order to reflect market conditions in the incentive payment, and

- Enhance the calculation of availability charges and incentive payments using a new availability incentive price, to better reflect daily resource availability.

Part 3 addresses needed changes to the ISO's substitution and replacement rules and processes. Enhancements are needed due to the flexible RA requirement and the difficulty load serving entities and suppliers experience in complying with increasingly complicated rules.

Part 4 proposes a durable market-based backstop mechanism and price that would replace the current capacity procurement mechanism (CPM) when it expires in February 2016. The ISO proposes to replace the current administrative price with a competitive solicitation process. Specifically the ISO would:

- Secure backstop capacity designated under the CPM through a competitive solicitation process to supplement the current CPM designation process outlined in tariff section 43.4,

- Implement a procedure for market participants to offer in capacity in the event of a CPM designation, and

- Pay a resource-specific offer price to the resource designated under the CPM competitive solicitation process. Under specific circumstances, this price could be mitigated when a supplier has market power.

2. Reliability services initiative roadmap

The reliability services initiative is expected to be ongoing and the scope will accommodate updates needed to policies and procedures related to RA resources. Capacity planning has changed and likely will continue to change as the west's energy landscape evolves. Assuring that resource planning adapts to these changes requires a coordinated effort with other agencies, including the CPUC. In acknowledgement of this, the ISO Board of Governors and the CPUC each voted unanimously in 2013 to adopt the JRP.[2] Many of the ISO's JRP-related processes aim to ensure that the capacity is effectively offered into the ISO's market so that the ISO can efficiently maintain reliable grid operations. This is why the reliability services initiative considers how to ensure both that adequate capacity is on the grid and that rules are in place regarding ISO market participation for RA resources.

Given the close coordination necessary, the ISO and CPUC have developed schedules related to the JRP. This roadmap shows the schedule for both ISO and CPUC processes.

The CPUC proposed to consider three tracks in their JRP proceeding:

- Track one will consider two to three-year forward-looking RA procurement requirements,
- Track two will consider implementing a long-term, joint reliability planning assessment with the ISO and the California Energy Commission, and
- Track three will consider determining rules and Commission policy positions on the ISO's development of a market-based backstop procurement mechanism to succeed the existing CPM, which expires in 2016.

The ISO will adjust the scope and schedule for phase two of the reliability services initiative according to the progress in track one of the CPUC's JRP proceeding. The ISO will only move forward with the multi-year RA portion of the scope in phase two if it is clear that the CPUC will adopt multi-year RA requirements. The ISO will still proceed with the risk-of-retirement policy assessment in phase two if the CPUC does not adopt multi-year RA requirements, as well as any remaining outstanding items from the Flexible Resource Adequacy Criteria and Must-Offer Obligation initiative (FRAC MOO). Therefore, although the schedule and scope may adjust, the ISO plans to move forward with the different phases of the reliability services initiative independent from the outcome of track one in the CPUC's JRP proceeding. This allows the ISO to begin phase two of the reliability services initiative before the formal completion of track one.

[2] http://www.caiso.com/Documents/DecisionJointReliabilityPlan-Memo-Dec2013.pdf

Figure 1: Schedule for CPUC JRP Proceeding and ISO Reliability Services Initiative

Agency	Milestone	Expected Date
ISO	Phase 1: RSI Straw Proposal Posted	June 5, 2014
CPUC	Track 1: Ruling Issuing Staff Proposal on Multi-year RA	July 1, 2014
CPUC	Track 2: Staff Straw Proposal on Multi-year Planning Assessment	July 15, 2014
CPUC	Track 1: Initial Comments on Staff Proposal	July 17, 2014
CPUC	Track 1: Reply Comments on Staff Proposal	July 31, 2014
ISO	Phase 1: RSI Revised Straw Proposal	August, 2014
CPUC	Track 2: Initial Comments on Staff Proposal	August 15, 2014
CPUC	Track 2: Reply Comments on Staff Proposal	August 29, 2014
CPUC	Track 3: Workshop to consider ISO proposal	September, 2014
CPUC	Track 3: Comments and replies	September - October 2014
ISO	Phase 1: RSI 2nd Revised Straw Proposal	October, 2014
CPUC	Track 1: Ruling Issuing Revised Staff Proposal on Multi-year RA	October 1, 2014
CPUC	Track 1: Opening Testimony on Revised Staff Proposal October 22, 2014	October 22, 2014
CPUC	Track 1: Reply Testimony on Revised Proposal November 5, 2014	November 5, 2014
ISO	Phase 1: RSI Draft Final Proposal	December, 2014
CPUC	Track 1: Proposed Decision on Multi-year RA	Q1 - Q2 2015
ISO	Phase 1: Target Board of Governors Meeting	Q1 2015
ISO	Phase 2: Issue Paper Posted	Q1 2015
CPUC	Track 2: Energy Division First Assessment	Q1 2015
ISO	Phase 2: Target Board of Govenors Meeting	Q2 2016
ISO	Phase 3: Issue Paper Posted	Q2 2016
CPUC	Track 3: Remaining proceeding items- legal briefing, proposed decisions, etc	As Needed

3. Plan for stakeholder engagement

The ISO proposes the following schedule for phase one of this initiative.

Item	Date
Paper: Issue paper posted	Tuesday, January 28, 2014
Meeting: Issue paper meeting	Tuesday, February 04, 2014
Meeting: 1st Working Group on CPM replacement	Monday, February 24, 2014
Meeting: 2nd Working Group on CPM replacement	Thursday, March 27, 2014
Meeting: 1st Working Group on RA processes	Wednesday, April 23, 2014
Paper: Straw Proposal Posted	Thursday, June 05, 2014
Meeting: Straw proposal meeting	Thursday, June 12, 2014
Comments due: Straw proposal comments	Thursday, June 26, 2014
Paper: Revised Straw Proposal	August
Paper: 2nd Revised Straw Proposal	October
Target Board of Governors Meeting	Q1 2015

PART I: MINIMUM ELIGIBILITY CRITERIA AND MUST-OFFER RULES

4. Evaluating default qualifying capacity provisions for system and local resource adequacy resources

4.1. Purpose

In order for a resource to qualify as a resource adequacy resource, it must obtain a net qualifying capacity (NQC) value. The ISO determines the NQC based on a resource's deliverable qualifying capacity during peak periods. The base of the NQC calculation starts with a resource's qualifying capacity value. Without a way to determine a qualifying capacity value, the ISO cannot calculate an NQC value for a resource. Usually, a local regulatory authority (LRA) establishes, and the ISO relies on, a methodology to determine the qualifying capacity value for resources procured by their jurisdictional LSEs for resource adequacy purposes. However, sometimes either an LRA chooses not to develop qualifying capacity provisions generally or has not yet developed rules for a specific resource type. Section 40.8 of the ISO tariff explains how to determine a resource's qualifying capacity if "the CPUC or Local Regulatory Authority has not established and provided to the CAISO criteria to determine the types of resources that may be eligible to provide Qualifying Capacity and for calculating Qualifying Capacity for such eligible resource types."[3] In such a case, the ISO can apply default provisions to establish a qualifying capacity value, and then calculate an NQC for the resource.

As part of the current stakeholder initiative, the ISO proposes to establish default qualifying capacity provisions, including availability and eligibility criteria requirements, for two additional resource types: distributed generation facilities[4] and non-generator resources.[5] The ISO has also reviewed the existing default qualifying capacity criteria in section 40.8.1 of the tariff to ensure the existing default provisions are still adequate. Based on this review, the ISO finds that the only existing default qualifying capacity provisions that need to be reviewed are those for proxy demand resources.

4.2. Issue statement

The ISO tariff currently provides specific default qualifying capacity provisions for thirteen different resource classifications.[6] The ISO has also undertaken several initiatives to enable distributed generation facilities and energy storage resources to provide capacity to the ISO

[3] ISO tariff section 40.8
[4] A distributed generation facility is defined as a Generating Facility connected to the Distribution System of a Utility Distribution Company, irrespective of the size of the facility or the resource type.
[5] An energy storage resource is defined as a resource that is capable of storing electricity at a given time for discharge at a later time.
[6] A resource classification, in this context refers to the different resources identified in subsections 40.8.1 of the ISO tariff. The resource classifications currently covered under section 40.8.1 include nuclear and thermal, hydro, unit specific contracts, contracts with liquidated damages, wind and solar, geothermal, qualifying facilities, participating load, jointly owned facilities, facilities under construction, system resources and pseudo-ties, and proxy demand resources.

system. Specifically, the ISO has completed or is currently conducting the following stakeholder initiatives to enable these resources to provide capacity to the ISO system:

- Deliverability for distributed generation,
- Non-generator resources in ancillary services market,
- Flexible RA criteria and must-offer obligation, and
- Energy storage interconnection.

There are no default-qualifying capacity provisions in section 40.8.1 for either distributed generation facility or non-generator resources. The ISO will look to develop such default provisions in the current stakeholder initiative. While this initiative outlines the default qualifying capacity provisions for distributed generation facility and non-generator resources, these resources are still subject to a deliverability assessment to determine the NQC ultimately used to determine how the resource can be counted towards meeting RA requirements. These deliverability assessments are beyond the scope of this stakeholder initiative.

Finally, to the extent the ISO relies on default qualifying capacity provisions, it must ensure these provisions continue to provide reasonable criteria for establishing a qualifying capacity. This helps to ensure that the resources given a qualifying capacity value under these provisions will help address resource adequacy needs. The ISO has reviewed all the existing default provisions to ensure that the criteria used for establishing a qualifying capacity value are adequate.

4.3. Establishing new default qualifying capacity provisions

The following section addresses the proposed default qualifying capacity provisions, availability, and eligibility criteria requirements for distributed generation facility and energy storage resources.

4.3.1. Distributed generation facility

As part of the deliverability for distributed generation stakeholder initiative, the ISO established the study methodology to determine that a distributed energy facility is deliverable. This would allow the resource to receive qualifying capacity and NQC values and potentially meet an LSE's resource adequacy requirement. The current stakeholder initiative will not revisit this process. Instead, it will focus on the availability and eligibility criteria requirements a distributed generation facility must meet and the method for determining the resource's default qualifying capacity.

The ISO must establish a methodology for determining the initial default qualifying capacity for distributed generation facilities. However, it is not feasible to identify a single methodology that applies to all technology types operating as distributed generation facilities. For example, a

distributed generation could be a solar, gas-fired resource, or storage resource. So the ISO proposes to apply the same availability criteria for a given resource classification of distributed generation facilities as those applied to the same resource classification interconnected to the transmission system. For example, a solar resource connected to the distribution system would have the same default availability and eligibility criteria as a solar resource connected to the transmission system. These current criteria are outlined in Figure 2: Summary of Bidding Requirements for Resources Providing RA Capacity, below.

Figure 2: Summary of Bidding Requirements for Resources Providing RA Capacity[7]

Resource Type	Bidding Requirements			
	IFM	**RUC**	**RTM**	**ISO Inserts Required Bids**
Generating Units Including Pseudo Ties (other than Use-Limited Resources)	Economic Bids or Self-Schedules are to be submitted for all RA Capacity for all hours of the month the resource is physically available (ISO Tariff 40.6.1).	$0/MW RUC Availability Bids are to be submitted for all RA Capacity for all hours of the month the resource is physically available (ISO Tariff 40.6.1).	Economic Bids or Self-Schedules are to be submitted for any remaining RA Capacity from resources scheduled in IFM or RUC. Economic Bids or Self-Schedules are to be submitted for all RA Capacity from Short-Start Units not scheduled in IFM (ISO Tariff 40.6.2, 40.6.3).	Yes (1)
Dynamic, Resource-Specific System Resources (other than Use-Limited Resources)	Same bidding requirement as above (ISO Tariff 40.6.1).	Same bidding requirement as above (ISO Tariff 40.6.1).	Same bidding requirement as above (ISO Tariff 40.6.2, 40.6.3, 40.6.5.1).	Yes (1)

[7] Available in the ISO's Reliability Requirements Business Practice Manuals at http://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Reliability%20Requirements.

Resource Type	Bidding Requirements			
	IFM	**RUC**	**RTM**	**ISO Inserts Required Bids**
Dynamic, Non-Resource-Specific System Resources	Same bidding requirement as above (ISO Tariff 40.6.1).	Same bidding requirement as above (ISO Tariff 40.6.1).	Same bidding requirement as above (ISO Tariff 40.6.2, 40.6.3, 40.6.5.1).	Yes (1)
Non-Dynamic, Resource-Specific System Resources (i.e. unit-specific imports)	Same bidding requirement as above (ISO Tariff 40.6.1).	Same bidding requirement as above (ISO Tariff 40.6.1, 40.6.5).	Economic Bids or Self-Schedules are to be submitted for any remaining RA Capacity from resources scheduled in IFM or RUC. No RTM Bids or Self-Schedules are required for resources not scheduled in IFM or RUC (ISO Tariff 40.6.2, 40.6.3).	Yes (1)
Non-Dynamic , Non-Resource-Specific System Resources (i.e. non-unit-specific imports)	Economic Bids or Self-Schedules are to be submitted for all RA Capacity consistent with inter-temporal constraints such as multi-hour run blocks or contractual limitations (e.g. 6 X 16). (ISO Tariff 40.6.1, 40.6.8.1, 40.8.1.12.2). Economic Bids or Self-Schedules must be submitted under the Resource ID registered as an RA Resource on RA Supply Plan.	Same bidding requirement as above. (ISO Tariff 40.6.1, 40.6.5). RUC Availability Bids must be submitted under the Resource ID registered as an RA Resource on RA Supply Plan.	Economic Bids or Self-Schedules are to be submitted for any remaining RA Capacity from resources scheduled in IFM or RUC. No RTM Bids or Self-Schedules are required for resources not scheduled in IFM or RUC (ISO Tariff 40.6.2, 40.6.3).	Yes (1)

Resource Type	Bidding Requirements			
	IFM	**RUC**	**RTM**	**ISO Inserts Required Bids**
Non-Hydro and Dispatchable Use-Limited Resources	Economic Bids or Self-Schedules are to be submitted for all RA Capacity for all hours unit is capable of operating consistent with the use-limitations described in unit's Use-Plan. RA Capacity from Eligible Intermittent Resources is not required to be offered into the DAM. (ISO Tariff 40.6.4.3.1, 40.6.4.3.4).	$0/MW RUC Availability Bids are to be submitted for all RA capacity for all hours unit is capable of operating consistent with the use-limitations described in unit's Use-Plan. RA Capacity from Eligible Intermittent Resources is not required to be offered into the DAM. (ISO Tariff 40.6.4.3.1).	Economic Bids or Self-Schedules are to be submitted for any remaining RA Capacity from resources scheduled in IFM or RUC, consistent with the use-limitations described in unit's Use-Plan. Energy Bids or Self-Schedules are to be submitted for all RA Capacity from Short-Start Units not scheduled in IFM, consistent with the use-limitations described in unit's Use-Plan (ISO Tariff 40.6.2, 40.6.3, 40.6.4.3.1).	No (2)
Hydro, Pumping Load, and Non-Dispatchable Use-Limited Resources	Economic Bids or Self-Schedules are to be submitted for RA Capacity that the market participant expects to be available Plan (ISO Tariff 40.6.4.3.2).	No RUC Availability Bids required (ISO Tariff 40.6.4.3.2).	Economic Bids or Self-Schedules are to be submitted for RA Capacity that the market participant expects to be available (ISO Tariff 40.6.4.3.2).	No (2)

Notes in table:

(1) ISO will insert economic bids and residual unit commitment (RUC) availability bids into DAM and RTM if required amounts of RA capacity are not offered into these markets.

(2) ISO will not insert bids for these resources when required amounts of RA capacity are not offered into the respective markets. An exception is that the ISO will insert economic bids into the IFM and/or RTM when there is a RUC availability bid or RUC schedule for a resource without a corresponding economic bid or self-schedule.

Regardless of the technology type, the ISO must still have visibility of the resources. Therefore, as with all other resource types identified in Section 40.8, the ISO will require that a distributed generation facility must be a participating generator or a system resource. At this time, this requires the resource be at least 0.5 MW. Finally, while individual distributed generation facilities may not exceed the minimum 0.5 MW, an aggregation of smaller distributed generation facilities may possibly exceed this level. However, because these aggregations may include resources from multiple resource classifications, addressing such aggregations is beyond the scope of the current stakeholder initiative.

4.3.2. Non-generator resources

Because non-generator resources currently do not have the existing default qualifying capacity availability or eligibility criteria other resource classifications have, it is necessary to develop those default criteria as part of this stakeholder initiative to ensure comparable treatment with other resource classifications.

First, as with the distributed generation facilities described above, non-generator resources must be a participating generator or a system resource.

Given the flexibility of many energy storage technologies and the high degree of availability the ISO expects of these resources, the ISO does not need to apply a minimum number of hours a non-generator resource must be available. In fact, the ISO has not identified any limitation that would preclude a non-generator resource from being available comparable to conventional thermal resources. For example, because the ISO is able to optimize a non-generator resource based on the resource's charge and discharge bids, that resource could be available to the ISO at all times. So, as with conventional thermal resources, the ISO will not propose a minimum number of available hours. Instead, the ISO proposes that availability of non-generator resources should be addressed under the must-offer obligation of non-generator resources.

The ISO must also determine the maximum value of the default qualifying capacity for non-generator resources. One of the unique attributes of energy storage resources is the ability to charge and discharge. While the benefit of this attribute may be captured in the effective flexible capacity calculation, it is not relevant for meeting system peak. So the ISO proposes basing non-generator resources' default qualifying capacity calculation on nothing more than the resource's discharge capability. In other words, the ISO proposes to limit the default qualifying capacity of an energy storage resource to no more than the resource's maximum instantaneous discharge capability. For example, a distributed energy storage resource that could discharge up to 5 MW could not have a default qualifying capacity value greater than 5 MW.

It is challenging to determine a non-generator resource's default availability and eligibility criteria for default qualifying capacity because of the diverse technology types that could fit into this classification. But while the resource capabilities may differ, the need addressed by the default qualifying capacity does not. The resource's capacity must be available for system peak needs

and the provision of ancillary services and regulation. So, as the ISO did in the FRAC-MOO stakeholder initiative, the ISO will provide two different default qualifying capacity provisions for non-generator resources. One will be for resources only providing regulation energy management (REM) and one will be for resources able to provide both energy and regulation. However, a non-generator resource cannot choose the REM option for the default qualifying capacity provisions and the energy option for determining the resource's effective flexible capacity (EFC) or vice versa.

Regulation energy management non-generator resource

A non-generator resource that wants to use the REM-only option for default qualifying capacity rules must be identified as a REM-only resource in the master file. Because a resource providing REM is prohibited from submitting energy bids in the day-ahead or real-time markets, the ISO finds it unreasonable to establish criteria for receiving default qualifying capacity based on the energy capability of these resources over extended periods of time. The default qualifying capacity of REM-only non-generator resources should be based on the resource's demonstrated ability to provide regulation. So the ISO will establish the default qualifying capacity of a REM non-generator resource based on their ability to provide energy for 15 minutes. As noted above, when making this choice, a resource is also choosing to have their EFC calculated using the REM-only option as well.

Energy non-generator resources

Non-generator resources that can provide energy over more sustained periods of time may choose default qualifying capacity provisions that consider the resource's energy capabilities. The ISO proposes to assess the default qualifying capacity of an energy non-generator resource based on the amount of output the resource can sustain over a four-hour period. This is consistent with the CPUC's recently released qualifying capacity provisions, detailed in the proposed decision in the RA proceeding (R.11-10-023). At first this seems much more restrictive than the provisions applied to the REM-only non-generator resources. But there are many benefits to choosing this option. The first is the ability to provide both energy and regulation. The second is that, when calculating the EFC, the ISO will consider the full charge and discharge capabilities of the resource. This potentially allows energy non-generator resources to have higher EFCs than REM-only non-generator resources.

4.4. Modifying existing default qualifying capacity provisions for Proxy Demand Resources

Currently, in section 40.8.1.13, the ISO defines the default qualifying capacity provisions for proxy demand response. In order for a proxy demand response resource to receive a qualifying capacity under the ISO's default rules, it only needs to be available for four hours per month and 30 minutes per event. The ISO sees these requirements as inconsistent with the default provisions used for other resource classifications. They are unlikely to ensure RA. Therefore, the ISO is proposing to replace the existing proxy demand response requirements with some

more closely aligned with CPUC requirements. Specifically, the ISO proposes that the minimum availability requirements be:

- At least 24 hours per month,
- At least three consecutive days, and
- At least four hours per dispatch.

The ISO is not proposing to change the methodology currently used for determining the level at which the default qualifying capacity is set.

4.5. Default flexible qualifying capacity provisions for phase two consideration

The ISO expects that the issues outlined in this section will require a significant amount of time and data collection before the ISO can develop proposals to address them. As such, the ISO has identified these items for phase two completion and outlines a high level plan for addressing these issues. However, if these issues are to be resolved by the end of phase two, the study process and data collection must start during phase one of this stakeholder initiative. While the issues outlined in this section will commence during phase one of this initiative, the ISO will not seek Board of Governors' approval for these issues until the completion of phase two at the earliest.

4.5.1. Intertie resources

As noted throughout the FRAC MOO stakeholder initiative, the current definition of flexible capacity will simultaneously address load-following and long, steep ramps, as long as the resources providing the flexible capacity are available for five-minute dispatch. In March 2014, when the FRAC-MOO revised draft final proposal was approved by the Board, the ISO committed to an additional review of how intertie resources could provide flexible capacity while still ensuring multiple flexible capacity needs are addressed.

In the FRAC-MOO stakeholder initiative, the ISO began their review of intertie resources and their ability to provide flexible capacity. Specifically, the review forecasted net load increases over 5, 15, 60, 90, and 180 minutes for the 2014 forecasted net-load.[8] The ISO has conducted a similar assessment using the 2015 forecasted net-load. This assessment is shown in Figure 3.

Figure 3: Assessment of Various 2015 Forecasted Net-Load Deviations

[8] See Table 2 in the Flexible Resource Adequacy Criteria and Must-Offer Obligation revised Draft Final proposal. Available at http://www.caiso.com/Documents/RevisedDraftFinalProposal-FlexibleRACriteriaMustOfferObligation-Clean.pdf

Month	Maximum 5-Minute Net load Change	Maximum 15-Minute Net load Change	Maximum 60-Minute Net load Change	Maximum 90-Minute Net load Change	Maximum 180-Minute Net load Change
1	675	1,630	4,720	6,112	8,286
2	800	1,618	4,220	5,733	9,257
3	657	1,404	3,908	5,257	8,351
4	693	1,310	3,501	4,542	7,198
5	597	1,178	2,919	3,786	6,117
6	511	1,189	3,271	4,459	7,530
7	1,411	1,425	3,108	4,373	6,366
8	814	1,167	2,659	3,548	6,098
9	677	1,376	3,225	4,248	6,881
10	1,319	1,578	4,216	5,699	8,965
11	722	1,622	4,874	6,474	9,595
12	805	1,815	5,338	6,952	9,940

The ISO finds that 15-minute intertie resources could provide an extra source of flexible capacity to address longer duration flexibility needs. But it may not be enough to simply look at the upward changes in the forecasted net-load to see how much 15-minute dispatchable intertie capacity we can use to address flexibility needs with longer durations. This is because we must also ensure that load-following and short-duration ramping needs are also addressed. So the ISO is seeking stakeholder input on how the ISO might assess intertie resources for flexible capacity.

4.5.2. Block dispatchable pumping load

In FRAC-MOO, the ISO recognized the benefits that flexible hydro resources can provide. The ISO also recognized the flexibility that non-generator resources' charging capabilities offer. But not every storage resource fit perfectly within the non-generator resource model. An example of this is hydro pump storage. The ISO was not able to determine whether or how to count the pumping capabilities of a pump hydro resource. The ISO is in the initial stages of reviewing this issue and several challenges have arisen. For example, large discrete dispatches of pumping load require the ISO to plan for additional voltage support as well as congestion management.

This has led the ISO to consider what "deliverability" means when addressing not just the pumping load, but any storage load. For example, even though the belly of the duck chart suggests the ISO would benefit from increasing load, it is unclear that transmission constraints would allow this to happen. In the ISO's energy storage interconnection initiative, just getting underway, the ISO will examine how the interconnection study process should assess the grid impacts of charging (or pumping) and what network upgrades may be required. To take the next step and count charging or pumping load as flexible capacity will require an examination of the concept of deliverability for charging or pumping load.

4.5.3. Assessment of ISO's dependence on CPUC maximum cumulative capacity buckets

In 2009 the ISO developed the standard capacity product in two phases. The first phase addressed the vast majority of resources, but exempted resources with a qualifying capacity determined by using historic data and demand response resources. The second phase, run in 2010, addressed resources with a qualifying capacity determined by using historic data. It deferred designing a standard capacity product for demand response resources. As discussed in section 6, the ISO's current availability incentive mechanism tracks the availability of RA capacity during five consecutive hours of each non-weekend, non-federal holiday day. The hours themselves are determined seasonally, based on historical coincident peak-load data. One of the primary goals of a standard capacity product is to make sure there are incentives in place, so that RA resources are available to meet peak load conditions. However, there are still drawbacks to this approach.

- Resources are only incentivized to be available during peak and may not ensure all off-peak needs may not be adequately addressed, and

- The risk of outage is focused over very few hours.

CPUC's maximum cumulative capacity buckets (MCC buckets) are another element of the existing RA market that has, to date, helped the ISO address system needs. For example, the MCC buckets are one of the primary tools of the CPUC's RA program preventing an over-reliance on use-limited resources. The MCC buckets are shown in Figure 4.

Figure 4: CPUC Maximum Cumulative Capacity Buckets[9]

[9] *2014 Filing Guide for System, Local and Flexible Resource Adequacy (RA) Compliance Filings,* Available at http://www.cpuc.ca.gov/NR/rdonlyres/0C2512A4-AE6C-4BB7-BC0D-75D2F40741BA/0/Final2014RAGuide.docx

Category	Resources may be categorized into one of the five categories shown below, according to their planned availability as expressed in hours available to run or operate per month (hours/month):
DR	Demand Response resources available for "Greater than or equal to" 24 hours per month.
1	"Greater than or equal to" the ULR [Use Limited Resource] monthly hours as shown in the Phase 1 Workshop Report, Table "Number Hours ISO Load Greater than 90% of the Monthly Peak," p.24-25, last line of table, titled "RA Obligation," http://www.cpuc.ca.gov/word_pdf/REPORT/37456.pdf These ULR hours for May through September are, respectively: 30, 40, 40, 60, and 40, which total 210 hour and have been referred to as "the 210 hours."
2	"Greater than or equal to" 160 hours per month.
3	"Greater than or equal to" 384 hours per month.
4	All Hours (planned availability is unrestricted)

For the past several RA cycles, the CPUC has proposed eliminating the MCC buckets. Though the ISO supports a reevaluation of the MCC buckets, simply discontinuing their use without putting a new structure in place is not advisable. It could result in an over-reliance of use-limited resources for RA capacity. So the ISO suggests that a reassessment of the MCC buckets, along with existing availability hours covered by standard capacity product, can provide guidance to LRAs, LSEs, and supply resources about the products needed to address system and local capacity needs.[10]

The first step of this reassessment will be to collect information. First, the ISO must determine if the existing MCC buckets will continue to effectively meet the ISO's reliability needs. If they will not, the ISO, LRAs, and other stakeholders must determine what new products are needed. For example, in the FRAC-MOO stakeholder initiative and the CPUC's RA proceeding, the ISO

[10] The ISO is not proposing to establish procurement requirements as part of this assessment, but will continue to work with LRAs to ensure the procurement matches ISO needs identified through this assessment.

identified categories of flexible capacity based on operational needs. If the assessment of the MCC buckets demonstrates a need for additional capacity products, the availability incentive mechanism developed as part of this stakeholder initiative can be easily modified to account for different or more hours.

Further, as part of this effort, the ISO proposes to collect data on *subset of hours* contracts, in which an internal resource may be under contract to provide RA capacity to the ISO only for certain hours of the day, perhaps for a subset of the typical 24-hour must-offer requirement. Currently a subset of hours rule is only in place for imported RA capacity. However, a full assessment of generic RA needs, by hour, was not conducted. The ISO proposes to begin collecting subset of hours contract information, which will help the ISO determine how these contracts align with the ISO's needs.

5. ISO Review of Must-offer Obligations

5.1. Purpose

The ISO has conducted a review of the must-offer obligations for each of the resource classifications identified in the tariff to determine if the must-offer obligations for all resource types are fully identified. As part of this review, the ISO has determined that the must-offer obligations for distributed generation facilities and non-generator resources require additional clarification.

5.2. Issues brief

While the must-offer obligation for most resource types appears appropriate at this time, the ISO notes that must-offer obligations for distributed generation facilities and non-generator resources is not well defined. The ISO considered an additional must-offer obligation for Proxy Demand Resources. However, after review, the ISO finds such a modification is not required because the proposed availability incentive mechanism should provide adequate incentive for proxy demand resources to be available to the ISO in a manner comparable to other use-limited resources.

5.3. Distributed Generation Facilities

In section 4.3.1, the ISO proposes that the default qualifying capacity provisions for distributed generation facilities should mirror the default provisions for similar resource classifications that are connected to the transmission system. As such, the ISO proposes that the must-offer obligation of distributed generation facilities should mirror resources connected to the transmission system. For example, if a distributed generation facility applies for and is approved for use-limited status, then that resource would be subject to the must-offer obligations of a use-limited resource.

5.4. Non-Generator Resources

In section 4.3.2, the ISO proposes not to include a minimum number of hours when non-generator resources must be available. The ISO can send dispatch instructions for a non-generator resource to charge or discharge based on ISO system needs. A non-generator resource that is fully discharge (charged) and unable to provide upward (downward) regulation because of ISO dispatch instructions is no different than a conventional resource that is unable to provide downward regulation because the ISO has dispatched the resource to Pmin. In short, the resource is available to the ISO but has hit an operational constraint. Further, because the ISO can optimize the dispatch of the non-generator resource through both the charge and discharge ranges, no operational or environmental limits appear to justify the ISO classifying a non-generator resource as a use-limited resource. Therefore, the ISO proposes that a non-generator resource be classified as non-use-limited, unless it submits an application for use-limited resource status and the application is approved by the ISO. As with any other non-use-limited resource, a non-generator resource would be subject to bid insertion rules. Current bid insertion rules include energy bids at the resource's default energy bid and zero for all certified ancillary service prices. The ancillary service price provisions will hold. But it is not clear how a non-generator resource could earn a default energy bid. For a non-generator resource, the incremental fuel cost is based on the price it pays for energy to charge the resource. Therefore, the ISO requests stakeholder input as to how to calculate default energy bids for storage resources and what costs should be included.

PART 2: AVAILABILITY INCENTIVE MECHANISM

6. Resource availability incentive mechanism

6.1. Purpose

Because reliability and market economics are inexorably linked, a reliable grid will also have the right incentives in place to ensure the market has access to the right resources at the right time, in the right location. The ISO market currently provides incentives beyond energy market revenues for RA resources to participate in the energy market, through payments for availability and charges for non-availability. This recognizes that RA resources have a higher call to serve and are essential to maintain grid reliability. The availability incentive mechanism was set up to increase reliability through rewarding high performing resources and penalizing low performing resources, reduce potential gaming, and increase the standardization of RA contracts. The mechanism will increase reliability by incenting suppliers to maintain their resources to limit forced outages that will expose the supplier to unavailability penalties and prevent them from earning availability payments.

6.2. Issues brief

Although the current availability mechanism is functioning for some resources, about half of the RA capacity in the ISO market is not subject to the mechanism or is unequally subject to the mechanism. This was detailed in the ISO working group presentation on April 23, 2014.[11] In addition to certain use-limited resources being unequally subject to the mechanism, flexible RA resources are not subject to the current mechanism. In March 2014, the Board adopted a flexible RA requirement, compliance categories, and associated must-offers for the 2015 RA compliance year. These rules are in tariff development and still need to be submitted to FERC. The initiative process is scheduled to address the topic of developing the flexible RA availability mechanism and price and conduct a holistic review of the incentive mechanism. The current availability price for RA resources is the CPM price, which expires February 16, 2016.

In order to integrate the flexible capacity requirement, the ISO's proposes a new availability incentive mechanism that will address the following issues[12]:

- The significant number and capacity of RA resources that are not subject to the current availability incentive mechanism due to exemptions in the tariff (40.9.2),

[11] Working group presentation beginning on slide 37: http://www.caiso.com/Documents/Presentation-ReliabilityServices-WorkingGroupApr23_2014.pdf
[12] For additional information on the issues please read the issue paper: http://www.caiso.com/Documents/IssuePaper-ReliabilityServices.pdf and working group presentation beginning on slide 37: http://www.caiso.com/Documents/Presentation-ReliabilityServices-WorkingGroupApr23_2014.pdf

- The significant number and capacity of RA resources that are use-limited and therefore not equally subject to the current forced outage method of calculating availability due to less restrictive outage requirements and exemption from the bid insertion rules that apply exclusively to use-limited resources,

- Enhancement of the availability incentive mechanism in order to cover flexible RA resources (also covering the associated, varying must-offer requirement obligations by flexible capacity category and capturing the economic bidding requirement), and

- A payment structure and price for the availability incentive mechanism that reflects market conditions and fairly distributes any availability incentive mechanism charges and payments. Currently a resource that is fully available all days of the month may receive the same payment as a resource that is fully available for only a single day.

6.3. Current SCP availability incentive mechanism

The ISO's current SCP incentive mechanism tracks the availability of RA capacity during five consecutive hours of each non-weekend, non-federal holiday day. The hours themselves vary seasonally based on historical coincident peak-load data. The availability during these hours is translated into a resource-specific monthly availability percentage. Availability is defined as capacity not on forced outage or affected by an ambient derate. Detailed rules describe how outages and derates count toward determining a resource's compliance in tariff section 40.

Resource availability during the five peak hours is compared against the historical availability average during that month for the past three years. A resource with an availability percentage more than 2.5% above the average is eligible for an availability incentive payment, while a resource with availability less than 2.5% below the average is subject to a non-availability charge. The availability price is the current CPM price of $70.88 per KW-year, which expires February 16, 2016.

More information on the current availability standard can be found in tariff section 40.9. Historical percentages and an assessment of the current availability standard can also be found in the ISO's April 23rd working group presentation.[13]

6.4. Summary of proposed design

The ISO proposes to use a portion of the current SCP incentive mechanism design in the creation of a new availability incentive mechanism. Resources will be paid or charged based on their availability relative to an ISO-determined, acceptable reliability range. The new availability incentive mechanism will assess availability based on whether a resource is bid into the ISO energy markets consistent with their RA must-offer obligation.

[13] ibid

The ISO proposes to assess flexible and generic RA capacity under a single availability assessment and not to double count any capacity if it is shown as both generic and flexible RA capacity. Any hours or capacity covered within the flexible or generic must-offer obligations will go into the resource's single availability assessment. When flexible must-offer requirements overlap with generic must-offer requirements, the ISO will hold the capacity to the higher flexible obligation. The ISO will only count a MW once in the assessment and there will only be one availability price.

The ISO will calculate a MW availability range specific for the resource, based on the standard availability incentive percentage range. Any capacity that falls below the standard availability incentive percentage range is charged the incentive price. The incentive mechanism will be self-funding so that available capacity above the standard percentage range is paid using the pool of money from the unavailable capacity. As a result, payments per MW of availability can be higher or lower than the unavailability charge and will depend entirely on the amount of unavailable capacity. When no capacity meets the criteria for an availability payment, the funds will be allocated to load.

Additionally, the new availability incentive mechanism will not count capacity on planned outage as available. Instead the mechanism will pull any capacity on a planned outage completely out of the assessment calculation. This treatment will also apply to other exempt outage types listed in section 6.10.

In summary, the ISO proposes three fundamental features to include in the availability incentive mechanism.

- First, the availability assessment will determine a resource's availability based on whether the capacity is bid into the ISO market. The bid must be consistent with the RA capacity type's must-offer requirement. For example, flexible RA capacity must be economically bid into the ISO's energy markets. Using such an availability assessment rather than an outage-based assessment will account for varying flexible must-offer obligations. It will also better calculate availability for use-limited resources.

- Second, a resource's availability will be assessed against a fixed percentage rather than a moving average. Initially the ISO had no data on the average availability of the fleet and did not want to devise a range that might unduly penalize resources. Now data is available to assess how a pre-determined fixed availability band could allow availability incentive payments to reflect market conditions without unduly penalizing resources.

- Finally, availability charges and payments will be calculated using a single price and assessment methodology for all RA capacity. This recognizes that the ISO needs a range of resources and capabilities to bid into the ISO energy markets in order to reliably operate the grid.

6.5. Bid-based availability assessment methodology

The availability assessment is how the ISO determines whether a resource is making itself available to the ISO per the tariff's must-offer rules. The ISO will calculate a resource's availability by comparing the MWs the ISO expected to be available to the MWs that were economically bid or self-scheduled into the ISO market. The ISO will translate this into a resource specific availability percentage and compare it to the standard availability range. Any MW amount that falls outside this range will be subject to an incentive payment or charge. If a resource's availability is less than the standard range, then the ISO will charge the resource. If the availability is greater than the standard range, then the ISO will pay the resource. Therefore the availability assessment methodology is central to the availability incentive mechanism.

Ideally, availability should be measured using the relevant must-offer requirement, MW amount shown on a resource's monthly supply plan, and the quantity economically bid or self-scheduled into the market for hours the capacity is listed as a RA capacity. If, because of the must-offer requirement, the RA capacity must be bid into the ISO market for certain hours, the resource's availability should be based on whether they made available their full RA value during those specific hours. This redefines the concept of availability. Where before it meant *not on forced outage,* it instead means offering into the ISO market during the resource's must-offer requirement hours.

The ISO finds two significant benefits from moving toward a bid-based, rather than outage-based, assessment. First, a bid-based availability metric will allow use-limited resources to be treated more like non-use-limited resources under the availability metric. Use-limited resources have the must-offer requirement to bid when available. However, availability is difficult to measure for use-limited resources using outage data. A bid-based metric will allow the ISO to calculate availability for these resources in the same process as non-use-limited resources.

Second, a bid-based methodology will allow the ISO to evaluate flexible resource availability. The flexible must-offer requirement mandates that scheduling coordinators bid in flexible RA capacity using an economic bid rather than a self-schedule. The current outage availability metric cannot monitor whether resources have an economic- or self-schedule. Therefore if the ISO does not move to a bidding metric of some type, the ISO will not be able to verify that flexible resources are in fact providing flexibility to the energy markets.

The following sub-sections describe the proposed bid-based assessment methodology.

6.5.1. Generic resource adequacy capacity

Generic RA capacity in this section refers to capacity shown as either system or local capacity in the ISO's monthly showing requirement. At this time the ISO does not propose to differentiate between local and system capacity in the availability assessment. This section

describes how a bid-based availability assessment would apply to generic capacity that does not overlap[14] with flexible capacity.

Must-offer requirements

The ISO has specific must-offer requirements for each hour a resource's capacity is shown as generic RA capacity. For most generic capacity the must-offer requirement is to bid or self-schedule capacity into the ISO market all hours of the day.

Specifically, tariff section 40.6.1 requires suppliers to make available to the day-ahead market all operationally available RA capacity. Scheduling coordinators must submit economic bids or self-schedules for all RA capacity and qualified ancillary services. Resources must also participate in RUC by submitting any additional capacity not procured in the day-ahead market. Tariff section 40.6.2 outlines additional resource bidding requirements.

Proposed availability assessment hours options

The ISO proposes a two-phase path forward for establishing assessment hours for generic RA capacity. Currently defined must-offer requirements are not in place to clearly delineate assessment hours for generic RA resource availability. The ISO is aware that certain resources are not in fact available or under contract 24 hours each day and it would be a significant change to hold all generic resources accountable to a 24-hour bidding availability check.

The ISO therefore proposes in phase one of this initiative to maintain the five-hour methodology used in the current SCP assessment hours. In phase two of this initiative the ISO can evaluate the benefits assessing resources every hour they are contracted as RA capacity.

In either phase, in some hours, the generic RA assessment hours will overlap with the flexible assessment hours. This is addressed in section 6.5.3.

Proposed availability assessment methodology

For generic RA capacity that does not overlap with flexible capacity, the ISO proposes to assess availability hourly, based on bids into the day-ahead and real-time market. In both markets, scheduling coordinators must provide the ISO with hourly bids or self-schedules subject to requirements in tariff section 40.6.2.

The ISO will use the availability assessment in a resource's average daily availability calculation, in both the day-ahead and real-time markets. This would mean that, in any individual hour, a resource could be above or below the standard percentage without incurring a charge or payment. Only if the daily MW-weighted average percentage fell above or below the standard percentage would a charge or payment be incurred. The ISO will then use the

[14] "Overlap" refers to the event where a single MW is both counted as flexible and generic resource adequacy capacity.

minimum of the day-ahead and real-time market availability assessment in the daily availability assessment percentage calculation.

The daily assessment methodology is illustrated in a separate spreadsheet, *Incentive Calculation Model*.

6.5.2. Flexible resource adequacy capacity

Flexible RA capacity refers to capacity shown as flexible capacity in the ISO's monthly showing requirement. Currently, as proposed in the Flexible RA Criteria and Must-Offer Obligation (FRAC MOO), there are three flexible categories. Resources under any category are considered flexible resource adequacy capacity. This section describes how a bid-based availability metric would apply to flexible RA capacity in the associated categories. This methodology also applies to flexible capacity that overlaps with generic capacity.

Must-offer requirements

For flexible RA resources, the FRAC MOO stakeholder initiative specified that flexible RA must-offer requirements would mirror the generic must-offer requirements with three exceptions:

- Resources would not have the option to self-schedule any portion of the resource shown as flexible RA capacity into the energy market,
- Resources must offer their full operationally available flexible RA capacity into both the day-ahead and real-time market, and
- Resources only have to offer into the ISO market during periods specified by their relevant flexible category.

In the FRAC MOO stakeholder initiative, the ISO determined that flexible RA capacity could fall into three categories with varying eligibility criteria and must-offer requirements. The categories of must-offer requirements are:

- Category one (base flexibility) capacity must offer into the energy market daily from 5:00 a.m. to 10:00 p.m. each day,
- Category two (peak flexibility) capacity must bid into the energy market daily for a pre-determined 5-hour window, and
- Category three (super-peak flexibility) capacity must bid into the energy market on all non-holiday weekdays during a pre-determined five-hour window.

Proposed availability assessment hours

Flexible capacity will be assessed during the hours determined by the resource's flexible category.

Proposed availability assessment methodology

The flexible assessment methodology will be the same as the methodology for generic capacity, as described in section 6.5.1. The ISO will use the availability assessment in a resource's average daily availability calculation in both the day-ahead and real-time markets. This would mean that in any individual hour a resource could be above or below the standard percentage without incurring a charge or payment. Only if the daily MW-weighted average percentage fell above or below the standard percentage would a charge or payment be incurred. The ISO will then use the minimum of the day-ahead and real-time market availability assessment in the daily availability assessment percentage calculation.

The specific assessment of the flexible requirement involves more variables than for generic capacity. For generic capacity the ISO must only look at whether a resource has a total offer into the ISO market for at least its shown RA capacity. For flexible capacity, the ISO must check that the capacity has been economically bid into the ISO market. In some cases, this is not as simple as checking that a resource's economic bid into the ISO energy markets is at least the shown flexible RA capacity.

In the ISO's FRAC MOO initiative, a resource's maximum amount of flexible RA was defined as a resource's effective flexible capacity (EFC). For most resources, the EFC is calculated using either of the following formulas, depending on the resource's start-up time. (In the formulas below, *SUT* means longest (cold) start-up time in minutes. *RRavg* means the average MW/min ramp rate between Pmin and NQC.)

- If start-up time greater than 90 minutes: EFC = minimum of (NQC-Pmin) or (180 min * RRavg)

- If start-up time is less than or equal to 90 minutes: EFC = minimum of (NQC) or (Pmin + (180 min – SUT) * RRavg)

When a resource's start-up time is greater than 90 minutes, a resource's availability is assessed entirely between Pmin and NQC. The ISO will therefore check whether the scheduling coordinator has economically bid in the resource up to the amount shown as flexible RA capacity.

When a resource's start-up time is less than 90 minutes, the assessment is more complicated. This is because the resource's Pmin capacity will count toward the EFC. Recall that the flexible must-offer rule is that flexible capacity must be economically bid into the market. The energy market does not allow scheduling coordinators to explicitly bid in Pmin capacity and resources' capacity is made available to the market by the submission of energy bids. Energy market bids are *incremental* to Pmin capacity.

This means that a resource's economic bid may not reflect their full EFC value if their EFC includes Pmin capacity. Therefore, in some cases in order to evaluate whether a resource has

met its bidding obligation, the ISO must account for the resource's Pmin capacity that counts toward their EFC.

The ISO proposes that for resources with a start-up time of less than 90 minutes, as long as a scheduling coordinator does not self-schedule their Pmin capacity or any portion of their energy schedule, the Pmin capacity will count toward a resource's flexible must-offer requirement. The ISO must impose this requirement because if any portion of a resources schedule above Pmin is self-scheduled, the ISO must also treat the Pmin capacity as a self-schedule and will not freely optimize the capacity in the market.

Practically, the ISO may not be able to freely dispatch Pmin capacity even without a self-schedule due to minimum run-time constraints; however, this was not addressed in the initial development of the EFC and will not be addressed in phase 1 of this initiative.

6.5.3. Overlap of flexible and system RA capacity

The relationship between generic and flexible RA is intricate due to the different must-offer requirements and counting convention for each capacity type. This relationship is important to understand when determining how the availability incentive mechanism should evaluate a MW if it is counted toward both the flexible and generic RA requirement. The RA requirement comes with different obligations for flexible and generic capacity. In order to calculate whether a MW has met their obligations and is therefore considered available, clear criteria in the circumstance of overlapping obligations are needed.

A flexible and generic MW within a single resource can have overlapping obligations if two conditions are met. First, the obligation on the capacity must overlap in time. That is, the capacity must have both a flexible and system must-offer requirement in an individual hour. This is an *overlapping hour*.

Second, the obligation must overlap in capacity. That is, a single MW within a resource must count as both flexible and generic capacity. This feature, a single MW within a resource only sometimes counting toward a RA requirement, is unique to flexibility. For example, a local resource has every MW up to NQC count as local capacity. There is no equivalent for flexibility. A resource may have a portion of their capacity that is flexible, a portion that is only generic, and a portion that is both generic and flexible. This is because under the ISO's counting rules flexibility is a capability of a resource's capacity, not an inherent attribute of a resource. When a single MW is counted as both generic and flexible capacity, this is *overlapping capacity*.

Therefore, if both the overlapping hour and overlapping capacity conditions are met, the ISO must determine how to measure a single MW's availability.[15] The ISO proposes to assess availability all within a single assessment and price. The overlapping concepts and assessment proposal are discussed in the following subsections.

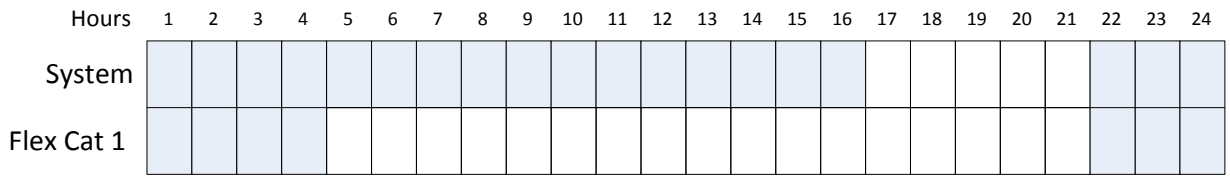
[15] When there is no overlap, the ISO will assess the MW under the applicable flexible or generic must-offer rules depending on how the MW was shown in the month-ahead resource adequacy process.

Overlapping hours

In order for a flexible and generic MW to overlap in the availability assessment, the first condition that must be met is that the capacity must-offer hours overlap. The generic and flexible must-offer hours may or may not overlap depending on the seasonal determination of availability hours for generic capacity and annual determination of category-specific must-offer hours for flexible capacity. Currently the system and flexible must-offer hour determinations are not done concurrently and within the same study processes. However, in the future the ISO will seek to align the timing of these assessments in order to simplify implementation and compliance.

Figure 5 illustrates a simple example of system and flexible must-offer requirements overlapping. Because the system must-offer hours are seasonal, these hours are simply illustrative. In this example a single resource, Resource A, has capacity shown to meet both system and flexible RA requirements. A least a portion of the resource's capacity is shown as system capacity. Therefore the system capacity has an assessment period of five hours on non-holiday weekdays. Some of the resource's capacity is also shown as flexible capacity in the base flexibility category and so it has an assessment period of seventeen hours, seven days a week. Figure 5 illustrates that on non-holiday weekdays the resource has overlapping must-offer requirement during hours seventeen through 21.

Figure 5: Theoretical generic and flexible category 1 availability assessment hours



Overlapping capacity

The second condition for a flexible and generic MW to overlap in the availability assessment is that a MW within the resource must be counted as both a flexible and generic MW. eThe ability for a flexible MW to not be a system MW or the ability for a system MW to not also be a flexible MW within a single resource. This is a function of the effective flexible capacity (EFC) methodology and unbundling of flexible and system capacity in the ISO's RA showing.

Figure 6 illustrates a simple example of overlapping capacity. The resource has a minimum load equal to zero and has a NQC and EFC both equal to 100 MW. In this example, the resource is shown for flexible and system resource adequacy for 100 MW each and therefore the capacity completely overlaps.

Figure 6: Overlapping capacity example one

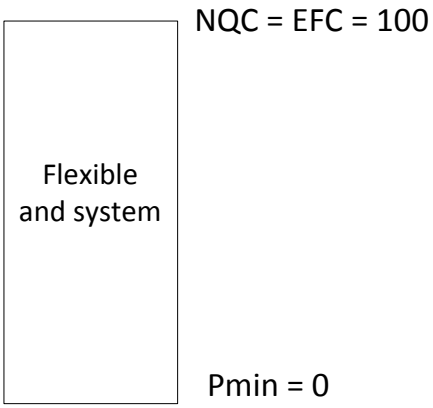
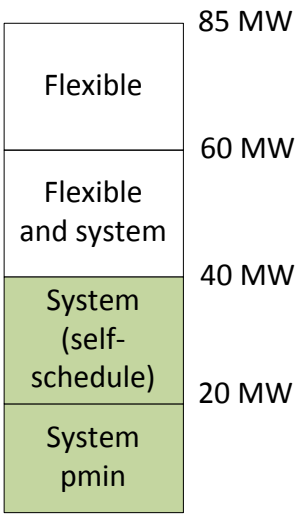


Figure 6 illustrates a more complicated example of overlapping capacity. The resource has a minimum load equal to 20 MW and because the start-up time is greater than 90 minutes, none of the Pmin capacity counts as flexible RA capacity. Therefore the NQC is equal to 85 MW, but the EFC is equal to 65 MW. The resource is shown for 60 MW of system RA capacity and 45 MW of flexible RA capacity. In this example the resource self-schedules a portion of its capacity, which means the resource must economically bid in the remainder of its capacity to meet the flexible obligation. The amount of overlapped capacity is therefore 20 MW.

Figure 7: Overlapping capacity example two



Overlapping assessment

When a resource has capacity shown as both flexible and generic resource adequacy capacity, the ISO must determine how to assess its availability. If the total generic plus flexible resource adequacy capacity is greater than the maximum of the EFC and NQC, then a portion of the resource's capacity must simultaneously satisfy the flexible and generic resource adequacy requirement. When this occurs the ISO must decide how to assess availability given that

flexible and generic resource adequacy capacity has different must-offer obligations that obligate the resource to fulfill different bidding criteria in different hours.

In general there are two possible methods of assessment. First, the ISO could determine availability separately for flexible and generic capacity. The ISO could assess the flexible availability of a resource and then completely separately assess the generic availability of a resource. These assessments could be combined under one price or evaluated completely separately using two prices. The primary detriment to doing this is that for the majority of capacity that is shown as flexible, the flexible capacity will entirely or almost entirely overlap with system capacity. This would cause a scenario where a flexible resource would essentially take on double the availability incentive risk compared to a generic resource. This does not seem fair and reasonable to the ISO.

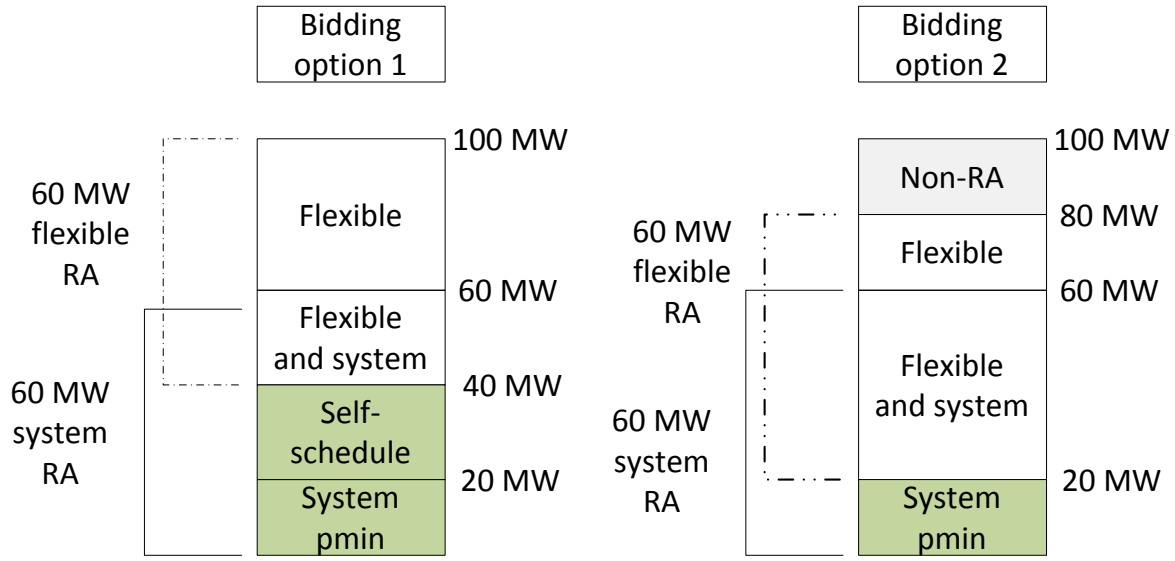
Second, the ISO could have a single assessment and hold the capacity to the highest must-offer obligation. This would only assess each MW one time and would not lead to double counting.

The ISO considered a design where the ISO had two assessments, but that the overlapping capacity was only considered in the flexible "bucket." The issue with this is twofold. First, in the event a resource meets its resource adequacy showing requirements, the ISO cannot determine the amount of overlapped capacity until the resource has been bid into the energy market. Second, if the resource does not meet its showing requirements, it may be impossible for the ISO to determine the overlapping capacity amount without making a fixed up front assumption. The following examples illustrate these concepts.

Figure 8 shows two examples where a resource meets its showing requirements, but has different overlapping capacity amounts. The resource has the following characteristics:

- An NQC equal to 100 MW, but due to the start-up time being greater than 90 minutes cannot count any of its Pmin as flexible capacity,
- An EFC of 80 MW, and
- 60 MW of flexible capacity and 60 MW of system capacity shown on the monthly RA plan.

Figure 8: Complicated overlapping capacity example



Based on how the resource bids into the energy market, the overlapping flexible and system portions can increase or decrease. Figure 8 illustrates how a single resource can bid into the energy market in different ways to meet their system and flexible capacity requirement. In bidding option one the resource has self-schedule for 20 MW. The total amount self-scheduled into the market is therefore 40 MW. The resource then economically bids in their remaining capacity to meet their 60 MW flexible requirement. The minimum overlapping portion therefore is 20 MW. This is because once the resource has a total schedule of self-schedules and economic bids of at least 60 MW, the resource has met their system requirement. The resource still though must have another 40 MW of economic bids to meet their flexible requirement.

In bidding option two, the resource does not self-schedule any capacity. The Pmin does not count toward the flexible requirement so the overlapping capacity is 40 MW. This example demonstrates that it is impossible for the ISO to determine the overlapping flexible and generic MWs of a resource prior to the resource bidding into the energy market and that it can vary even in the circumstance a resource meets their must-offer requirements.

This example also illustrates that if the resource did not economically bid, the ISO would not be able to determine the overlapping portion whatsoever as it could range from 20 MW to 40 MW. For example, if the resource were self-scheduled up to 100 MW, the ISO would have to decide how “available” the resource was since on the surface the resource appeared to meet 100% of their system showing and 0% of their flexible. If the ISO were to assess availability in this manner, the overlapping MWs would be double counted. A single MW would be both considered “available” and “unavailable.” While this might be beneficial to suppliers in the event a flexible MW was self-scheduled, in the event a resource was on forced outage, this would also double count a MW as “unavailable” and the resource would be double penalized.

The difference in must-offer requirements between flexible and generic capacity is mainly whether a MW was economically bid into the energy market (required under flexible must-offer requirement) or self-scheduled into the energy market (allowed under generic must-offer requirement). Therefore, the ISO must determine whether a resource should be considered available if it is shown as both generic and flexible resource adequacy capacity and is self-scheduled into the market. If, under the two outlined overlapping conditions, the ISO considers a self-scheduled MW available, the ISO must then break out availability into two buckets and have two availability assessments- one for flexible and one for system. This is because the MW would be considered available under system must-offer rules and unavailable under flexible must-offer rules. Under this methodology, in the event of an outage or non-bidding, a MW would be double counted as unavailable. It is not possible to have a *single* availability assessment and give a scheduling coordinator credit for self-scheduling a MW that is also shown as flexible capacity without completely undermining the flexible must-offer requirement.

First and foremost, in the interest of not introducing further complexity into an already complex system, the ISO proposes not to move toward a double-counting method of assessment. Instead, the ISO proposes to have a single assessment and price for availability based on a MWs highest obligation. Therefore, in the event of an overlap, the ISO would not give credit to a scheduling coordinator for self-scheduling a MW. This proposal also reflects the fact that the ISO created the flexible requirement in part due to difficulties with oversupply.

Therefore, rather than proposing a double counting assessment, the ISO proposes a single availability metric. In the event generic and flexible capacity overlaps the ISO will hold the resource accountable to the full flexible must-offer obligation and not credit the resource for any self-schedules in this overlapped capacity. The ISO proposes that the total resource adequacy capacity of a resource is the maximum of the flexible and generic resource adequacy showings.

For example, a resource has an NQC = EFC = 100 MW and a system requirement of 100 MW and a flexible requirement of 70 MW. The resource has a self-schedule of 90 MW and an economic bid of 10 MW. The ISO will do the following calculation:

- Total RA = Maximum (flexible requirement, generic requirement) = 100 MW,
- Required flexible RA = 70 MW,
- Remaining generic RA = 30 MW,
- Economic bid of 10 MW, all 10 MW can count toward the flexible requirement, and
- Self-schedule of 90 MW, only 30 MW of which can count toward the generic requirement.

In this hour, therefore, the resource's total availability is 40MW / 100 MW or 40%. Availability in an overlapping hour will therefore be calculated as whether the resource met the relevant must-

offer requirements for the overlapping and non-overlapping capacity amount during the resource's must-offer hours. The total availability percentage will be capped at 100% available.

6.6. Availability incentive standard percentage

The ISO proposes to create an availability incentive standard percentage band to assess individual resource availability against. In order to limit small amount of money exchanges between resources, the ISO proposes a 4% band around a target availability percentage. The ISO currently calculates the monthly availability incentive standard, using the historical forced outage rates of RA resources over the range of assessment hours for each month over the prior three years. The ISO proposes to continue the current mechanism construct of comparing resources to a percentage with a bandwidth. However, the ISO proposes to change how the availability incentive standard percentage is calculated.

The monthly RA construct implies that resource availability in non-peak months is equally important to reliability as resource availability in peak months. The system requirement in non-peak months is already less than peak months so the ISO does not need to reflect this in availability standard. The ISO proposes to move from an availability incentive standard percentage that is based on an expected forced outage rate included in the 115% planning reserve margin and the historical outage average for the previous four years. This proposal is based on the following considerations:

The availability incentive mechanism is a self-funding mechanism. Therefore, while each MW below the standard band is charged the availability incentive price, each MW above the standard band is only paid from the total charges on a per MW basis. Using historic availability has removed the possibility of any payments to generators that perform above the band in three of the months. (See *Figure 9*, Jan, Feb, and Dec.) The ISO has still charged resources in these months and instead has allocated these payments to load. A fixed standard percentage will allow resources to receive payments in months of average high availability.

Fixing the percentage will allow the payments made to resources to clearly reflect current market conditions. In months with an average high availability, less capacity will be charged and therefore resources will receive less of an incentive payment to perform. In months with low availability, more capacity will be charged and higher performing resources will be paid a higher amount per MW to perform. Therefore although the unavailability charge per MW is always the same, the availability payment per MW will directly reflect monthly market conditions.

Fundamentally, fixing the availability standard percentage will allow the mechanism always to charge resources if they are not meeting the minimum amount relied on by the ISO to operate the grid. Therefore it will additionally motivate resources to perform when they are most needed, by paying resources that meet the requirements for availability payments more when average availability is lowest. This creates the correct incentives to perform and over-perform during the periods when the ISO will need availability the most.

Figure 9: Average historical availability incentive standard percentage bounds compared to proposed bounds

	Current band (average)			Proposed band	
	Lower bound	*Upper bound*		*Lower bound*	*Upper bound*
Jan	95.1%	100.0%		94.5%	98.5%
Feb	95.1%	100.0%		94.5%	98.5%
Mar	93.9%	98.9%		94.5%	98.5%
Apr	93.1%	98.1%		94.5%	98.5%
May	92.3%	97.3%		94.5%	98.5%
Jun	94.1%	99.1%		94.5%	98.5%
Jul	93.8%	98.8%		94.5%	98.5%
Aug	93.3%	98.3%		94.5%	98.5%
Sep	93.3%	98.3%		94.5%	98.5%
Oct	94.2%	99.2%		94.5%	98.5%
Nov	93.8%	98.8%		94.5%	98.5%
Dec	95.2%	100.0%		94.5%	98.5%

The ISO proposes to put a 2% upper and lower bound on 96.5%. This number is supported by the average historical availability for the prior 4 years, which on average for all years and months, shows 96.4% availability from applicable resources. (See *Figure 10.)*

Figure 10: Average historical availability incentive standard percentage bounds by year

Trade Month	Availability Standard Percentage				Average
	2014	*2013*	*2012*	*2011*	
Jan	97.7%	97.5%	97.2%	98.0%	**97.6%**
Feb	97.0%	97.7%	97.8%	98.0%	**97.6%**
Mar	96.8%	97.0%	95.7%	96.0%	**96.4%**
Apr	96.2%	95.8%	95.4%	95.0%	**95.6%**
May	95.3%	94.9%	94.0%	95.0%	**94.8%**
Jun	96.3%	96.3%	96.6%	97.0%	**96.6%**
Jul	96.9%	96.6%	96.0%	96.0%	**96.3%**
Aug	95.1%	95.3%	96.8%	96.0%	**95.8%**
Sep	95.9%	95.5%	95.8%	96.0%	**95.8%**
Oct	95.3%	96.3%	97.2%	98.0%	**96.7%**
Nov	95.9%	96.1%	97.1%	96.0%	**96.3%**
Dec	97.4%	97.8%	97.7%	98.0%	**97.7%**
Average	**96.3%**	**96.4%**	**96.4%**	**96.6%**	**96.4%**

The reason the ISO proposes to continue using the band and not a single target is to prevent large amounts of payment shifting for relative small differences in availability. The width of the band must balance needless payment shifting for small availability differences and under- or over- subjecting resources to the mechanism.

6.7. Availability incentive price

The ISO proposes to use only a single price and not to have multiple prices for local, system, or flexible availability. This proposal is based on the premise that all RA capacity is needed to run the grid and that a particular type should not be more or less encouraged to participate in the energy markets.to maintain their resources to prevent forced outages. The ISO acknowledges that certain resources may receive higher per MW RA compensation based on their location or resource capabilities. Theoretically, perhaps these resources should be subject to a higher availability price. However, the ISO does not anticipate having sufficient, easily accessible information to calculate these values. This information would be necessary to decide which resources it would make sense to hold to a relatively higher or lower availability price.

Previously the ISO has thought that there will be a premium on flexible resource adequacy capacity. While this may be the case, certain market participants have pointed out that, in the future, flexible resources are expected to receive additional revenue in the energy and ancillary service markets. In this case, flexible resources may not require a premium when compared to system or local resources. It may be that certain flexible resources require a contracting premium, while other flexible resources do not. Given this uncertainty, the ISO proposes to

maintain the current structure of a single availability price for all RA types.[16] A single price has the additional benefit of simplifying availability incentive mechanism overall.

The availability incentive charge and payment should ideally have the following attributes:

- Incent resources to perform routine maintenance in order to prevent unexpected outages
- Be a low enough not to be overly punitive to resources,
- Reflective of the value of replacement capacity, plus a small premium, and
- Reflective of market conditions, as possible.

The ISO proposes two considerations for the CPM described in section 9. The ISO proposes that, even in a competitive solicitation process, market power mitigation measures likely need to be in place. The ISO could create an offer cap as both a mitigation measure and a price for the availability incentive mechanism. Second, the offer cap price, availability incentive mechanism price, or both could be derived using capacity contract data from the CPUC. This would involve an assessment of capacity contracts. The ISO expects that using this data for the availability incentive mechanism may be easier than for the backstop mechanism offer cap, given the burden that the offer cap must reflect current market conditions. The availability incentive mechanism price itself does not have to reflect market conditions, as it is only a piece of the overall payment or charge that reflects availability.

6.8. Availability incentive assessment example

The ISO demonstrates how the availability assessment could work in a separate spreadsheet, *Incentive Calculation Model.*

6.9. Wind and solar resources

The energy market optimization has functionality for wind and solar resources that allows these resources to bid or self-schedule up to their forecast. For resources that have output dependent on a dynamic forecast, the ISO proposes to measure availability using the minimum of the amount shown for RA and either the ISO- or the scheduling coordinator-provided forecast. This will cause a renewable resource to be considered 100% available when the wind or solar forecast in any hour is below the amount shown for RA capacity and the resource is bid in up to the forecast amount.

6.10. Exempt capacity due to outages and derates

When RA capacity is unavailable due to certain types of outages, the period of the outage will be pulled out from the assessment calculation. The capacity is not counted as available or unavailable. Instead it is simply not part of the availability assessment. The recently completed

[16] Currently the ISO has a single price for both local and system availability, despite an established capacity price premium for certain local areas.

outage management system (OMS) stakeholder initiative has proposed revised tariff language changing the definition of forced and planned outages, creating newly defined types of outages, clarifying the rules under which RA resources request outages, and creating new *nature of work* categories for outages. More information can be found in the draft tariff for the OMS stakeholder initiative. Planned outages come in four types. When the type requires replacement, the availability incentive will apply to the replacement resource. When the planned outage does not require replacement, no obligation will transfer and the capacity on outage will not be considered in the availability assessment. The four planned outage types are:

- Maintenance outage with replacement,
- Maintenance outage without replacement,
- Off-peak opportunity outage without replacement, and
- Short notice opportunity outage without replacement.

The new OMS system also contains a nature of work description to describe forced outages. The nature of work codes indicate why the resource is on outage. The basic policy is that resource outages will be excluded from the availability incentive process if an outage is beyond their control. The ISO proposes to exclude the following nature of work codes from the availability incentives:

- Unit testing,
- Unit cycling,
- Unit supporting startup,
- Transitional limitation,
- Ambient not due to temperature,
- Transmission induced outage, and
- Environmental restrictions use-limit reached.

When RA capacity is on a forced outage and has provided substitute capacity to the ISO, the ISO will transfer the must-offer obligation and assessment to the substitute capacity and not assess the original resource's capacity under the availability incentive mechanism. Capacity that is exempt from the availability incentive mechanism due to an outage or derate is not eligible as substitute capacity.

6.11. Use-limited resources

Use-limited resources can have daily or monthly limitations. Daily limitations, MWh or other limitations, can be accounted for in the optimization and should not lead to the need for special treatment under the availability incentive mechanism. On the other hand, the ISO's market optimization cannot account for monthly limitations. To address this deficiency, the ISO will allow resources to include opportunity cost in their minimum load and start-up costs. (Resources can already include opportunity costs in default energy bids.) This functionality will be included in the commitment cost enhancements initiative.[17]

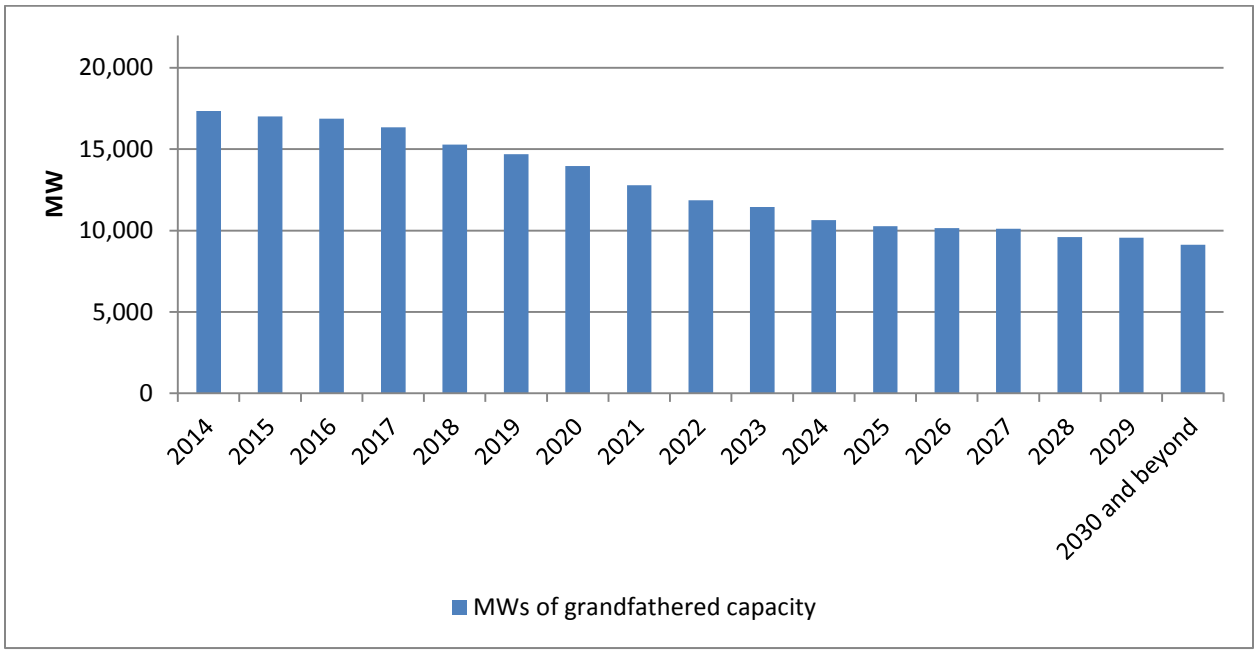
Some use-limited resources that do not have calculable opportunity costs may be exempted from the availability incentive mechanism. Any exceptions will be determined through a review of use plans. The ISO seeks stakeholder feedback on the types of use-limitations that may require an exemption from the availability incentive mechanism.

6.12. Exempt resources

Currently, resources that fall under tariff section 40.9.2 are exempt from the SCP availability incentive mechanism. The new availability mechanism will likely need to include similar exemptions for certain resources. The ISO does not propose to automatically apply the same exemptions to the new availability incentive mechanism. This is partly due to the significant amount of capacity exempt from the current incentive mechanism. Figure 11 shows the grandfathered contract capacity and contract year the RA capacity will expire. The ISO will not implement the new availability incentive mechanism until 2016. Additionally, many contracts will have to be and have been reopened due to the new flexible RA requirement. Given these two points and the rapidly changing energy landscape, the ISO does not think it is in the best interest of reliability to expose only a portion of resources to new rules needed to reliably integrate renewable and preferred resources. The ISO will therefore seek to exempt only a select set of resources that are physically or uniquely unable to fully comply with their must-offer requirement.

[17] http://www.caiso.com/informed/Pages/StakeholderProcesses/CommitmentCostEnhancements.aspx

Figure 11: Grandfathered capacity exempt from current Standard Capacity Product availability mechanism by year



PART III: REPLACEMENT AND SUBSTITUTION

7. Replacement

7.1. Purpose

The ISO developed the replacement rule in recognition that while the ISO needs to be able rely on the capacity of resource adequacy requirement each month, there need to be appropriate opportunities for resource adequacy resources to take maintenance outages. The rule mandates that capacity on a scheduled maintenance outage may need to be "replaced" with sufficient capacity in order to maintain grid reliability.

The current replacement rule for resource adequacy arises because of the monthly nature of the existing resource adequacy construct. Currently, resource adequacy requirements are determined monthly and vary according to the load requirements for each month. The planning reserve margin incorporated into each monthly requirement accounts for an anticipated amount of forced outages of resource adequacy units during the month, but is not designed to account for resources on planned outages for scheduled maintenance.

Therefore, when an LSE submits its monthly resource adequacy showing, the resources are expected to be available for the entire month. If a resource on an LSE's monthly resource adequacy showing has an outage already scheduled when the submissions are due 45 days before the month, the LSE may be required to provide replacement resource adequacy capacity to make up for resource adequacy capacity on outage. For outages requested after the monthly LSE showings, the responsibility for replacing resource adequacy capacity switches to the resource. This structure was a compromise between stakeholders who wanted the entire obligation to be LSEs and other who felt the suppliers should be entirely responsible for replacement.

Proposed tariff language to implement the new OMS system[18] in the fall of 2014 clarifies the rules under which adequacy resources may request outages without the outage impacting the resource's availability incentive calculation.

Local resource adequacy resources are accommodated under the existing rule and may take maintenance outages without having to provide local resources as replacements. This is in part because the local requirement is annual and therefore there is often little or no excess local resources to provide replacement in the event of an outage. The Outage Management group at the ISO will evaluate the request for an outage by a local resource to determine whether the outage can be accommodated without creating any local reliability issues. Assuming that is the case, the outage can occur, but then the outage is considered like any system resource adequacy resource outage to see if there is enough resource adequacy capacity remaining to ensure the reliability of the system. In this case, the resource may be required to provide replacement capacity, but the replacement requirement is not required to be local capacity.

[18] http://www.caiso.com/informed/Pages/StakeholderProcesses/OutageManagementSystemProject.aspx

7.2. Issues Brief

There are several issues that the ISO plans on addressing within this initiative related to the replacement rules. These issues can be grouped into three categories.

First, the ISO must create replacement rules that account for the board approved flexible resource adequacy requirement.[19] The ISO is aware that many LSEs and suppliers have found the current replacement rule complex and that it has added transaction costs to different parties. Rules related to flexible resource adequacy are likely to only increase the complexity. The ISO seeks input from stakeholders on how the replacement rules can be extended to include the flexible resource adequacy requirement while not significantly increasing complexity and ensuring the reliability which resource adequacy is designed to provide. Section 7.3 below describes the ISO's initial thoughts on how to adopt replacement rules for flexible RA capacity.

Second, in the 2013 Stakeholder Initiatives Catalog process, one of the top initiatives prioritized by market participants was an initiative to modify the type of replacement required for capacity which may meet local or flexible qualifying requirements, but which is shown as generic system capacity. The stakeholders would like for this capacity to be able to be replaced during an outage with generic system capacity rather than having to replace this capacity with flexible or local capacity.

Third, in response to this initiatives issue paper, stakeholders brought up several additional items. Additionally, the ISO is considering potential modifications to improve the functioning of the replacement rules. These primarily dealt with concerns with complexity, avoiding unnecessary CPM designations for resources which may have a contract but are not shown as resource adequacy resources, and issues concerning the fairness of the replacement rules and whether they allow some market participants to lean on others. The ISO address each of these below.

Complexity

Many stakeholders have brought up the inherent complexity with the replacement rules. The ISO seeks input on the specific aspects of the replacement rule that market participants are finding the most challenging to comply with. Some potential complexities could be:

- The often daily nature of needed replacement
- Stringency in rules surrounding what characteristics a resource must have when being used in a replacement
- Software or process that market participants use to make replacements
- Time period in which the replacements must be made
- Uncertainty surrounding if a replacement will be needed
- Different processes and software used for substitution and replacement

[19] Flexible resource adequacy requirements are still in tariff development and still needs to be filed at FERC.

The replacement rules adopted were designed to ensure the reliability benefits and balance the interests and concerns of various stakeholders. Requiring LSEs to provide replacement capacity for resources included in their monthly resource adequacy showings, and after the showings switching the requirement to the resources balanced the interests of suppliers and LSE, as well as keeping the basic structure which had previously existed with the CPUC replacement rule. After a year and a half of experience, and as we design replacement rules to extend to flexible resource adequacy, the ISO believes this is an appropriate time to consider whether the replacement rule could be made simpler.

CPM designation risk

It is the ISO's understanding that sometimes LSEs have contracted with resources, but have not have shown the resources on their monthly resource adequacy plan to avoid subjecting the resource to the must-offer obligation and potential availability penalties. Since these resources are not resource adequacy resources, the resource could get a CPM designation. This would cause the resource to be paid twice for capacity; once by the LSE with which it has contracted, and then from the CPM designation. The ISO seeks further information on this concern as well as potential methods to resolve this issue.

Resource Leaning

Stakeholders have expressed concern that the existing rules for replacement treat different stakeholders differently. Some LSEs may not have to provide replacement resources as often as others because the size of their resource adequacy resources are more likely to be covered by the excess resource adequacy resources in any month, eliminating the need for them to provide replacement capacity.

If there is only a small amount of excess capacity provided in the monthly resource adequacy showings, an LSE with a small resource adequacy requirement may find that an outage might not require replacement because the small amount of excess will cover the outage of its resource. However, an LSE with a larger resource on its resource adequacy showing might find that there is not enough excess capacity to avoid a requirement to replace its resource on outage. This treats all LSEs the same, since all LSEs face the same situation with regard to similarly sized resources included in their resource adequacy showings. Further, a requirement that all resources on an LSE's monthly showing provide replacement capacity might result in the ISO requiring more resource adequacy than the total monthly requirement. The ISO does not feel that this is justified as it would result in excess costs.

The ISO seeks clarification from market participants on the accuracy of the issues described, additional issues that may be outstanding, and finally, the extent to which these issues merit being addressed in phase 1 of this initiative.

7.3. Proposed replacement rules for flexible resource adequacy resources

The new flexible resource adequacy requirements will vary each month. This will require that LSEs may need to provide replacement flexible capacity for resources that have planned

outages during the month already scheduled at the time of the monthly resource adequacy showings. Further, resources committed to provide flexible resource adequacy for a month may need to provide replacement flexible capacity to avoid impacts to their flexible SCP availability for planned or forced outages requested after the monthly resource adequacy showings. Similar to existing replacement rules, replacement for flexible resources requires similar resources to ensure reliability.

Starting in the 2016 resource adequacy year, the ISO proposes that flexible resources will be subject to replacement requirements similar to those currently applicable to system resource adequacy resources. These rules will have implications for both LSEs based on the resources shown on their monthly resource adequacy showings, as well as for resources providing flexible resource adequacy capacity. Additionally, since flexible resource adequacy capacity may be unbundled from system or local resource adequacy capacity, but may also be provided by the same megawatts of capacity providing system or local resource adequacy capacity, there are interactions which must be considered.

As with system resource adequacy, the flexible resource adequacy capacity shown by LSEs on their monthly resource adequacy showings is expected to be available to the ISO for the entire month. LSEs which include a flexible resource in their monthly resource adequacy plan which has a planned outage scheduled during the month may need to provide replacement flexible capacity for the days the resource is on outage. Similar to how this is determined for system and local resources, if the planned outage of flexible resource adequacy capacity causes the LSE's flexible resource adequacy to be below its monthly requirement and the total level of flexible capacity to drop below the monthly requirement for the entire system, the LSE will be required to provide replacement flexible capacity.

For outage requests after the 45 day-ahead resource adequacy showings, the resources will face the same rules that apply today to outages of system or local resource adequacy capacity. Since these rules will be implemented after the implementation of OMS this discussion will follow the revised rules adopted for the OMS initiative. Resources may request a planned or forced outage with sufficient notice, either providing replacement capacity, or requesting that the outage be approved without replacement if possible. Similarly, flexible resources will be able to request Off Peak Opportunity Outages and Short Notice Opportunity Outages, which would be approved at the ISO's discretion if they can be accommodated without reliability impacts, and without requiring replacement capacity.

There will need to be additional rules for flexible outages, in order to assure that reliability of the grid is not harmed and that the ISO's initial determination that the flexible resource adequacy capacity provided for a month is sufficient to meet the ISO's operational needs. The easiest way to implement this would be to require that all replacement flexible resources be Category 1 resources. This would ensure that any replacements would not cause the amount of flexible resource adequacy in each of the flexible categories to violate the limits on that category, but while certainly simple, it is very restrictive. Another possible way to address this concern in implement is to require that a flexible resource on outage must be replaced by a resource in the same category, or, a category of flexible resource with more standard availability hours. In

other words, a flexible resource in category 1, with the most hours of availability requirements, must be replaced by another resource from category 1; a resource from either category 2 or 3 will not be acceptable as a replacement, because it would not ensure the same availability of flexibility that the original resource provides. However, even ensuring that resource categories of replacement resources do not potentially impact reliability, a replacement resource's operating characteristics may not maintain the level of reliability of the grid. Replacements are allowed at the discretion of the ISO, and in approving a request for replacement of a flexible resource adequacy resource, the ISO may also need to consider the level of flexibility of the two resources. A very slow ramping resource may not be a viable replacement for a fast ramping resource. The ISO seeks stakeholder comments on how these additional replacement rules for flexible RA capacity should be implemented.

Determining if replacement capacity must be provided for outages of resource adequacy units should be very similar to the current process, assuming a resource is only providing system/local resource adequacy capacity, or only providing flexible capacity. However, for units providing both system and flexible capacity the replacement determination will need to look at both the flexible and system resource adequacy capacity levels. For the LSE replacement analysis done after the monthly resource adequacy showings, if a scheduled outage doesn't reduce the LSE's amount of either flexible or system capacity below the LSE's requirement, no replacement would be required. If either system or flexible capacity drops below the LSE's requirement, then the ISO considers whether the outage causes the overall level of system or flexible capacity to drop below the overall requirement. This analysis is done on a daily basis, with outages being considered based on when they were scheduled; those outages which were scheduled first will be considered for replacement need first. If the outage would cause the overall level of system or flexible resources to drop below the monthly requirement for the day, the LSE would be required to provide replacement resource adequacy capacity for that day. Thus, a resource providing both system and flexible resource adequacy capacity may be required to replace the system capacity, the flexible capacity, or both on any day during the scheduled outage. This may result in replacement requirements for only flexible capacity on the first day of the outage, no replacement requirement for the second day, a replacement requirement for both flexible and system capacity for the third day, a replacement requirement for only system capacity on the four day, and so on. Any replacement capacity may provide only system capacity or only flexible capacity, or may provide both if it is capable.

For outage requests submitted by resources after the monthly showings the same complications may apply. If a resource is providing both flexible and system resource adequacy capacity, the outage may be able to be taken without replacement of either type of resource adequacy capacity, or may require the replacement of either or both of the system and flexible capacity.

The ISO recognizes the increased complexity that will arise when replacement rules are applied to flexible resource adequacy resources as well as system/local resources. The ISO encourages stakeholders to suggest methods that might reduce this complexity.

7.4. Altering which entity is responsible for replacement

There may be benefits of reduced complexity in the replacement rules which could be achieved by altering the current structure of which entities are responsible for replacement, and possibly subject to the availability incentive mechanism. This includes both making the requirement entirely the responsibility of the supply, and allowing the LSEs to have the responsibility of replacement and the incentive mechanism.

The ISO is seeking comments from stakeholders on whether such modifications of the responsibility for replacement and availability are advisable. Stakeholders are encouraged to suggest alternative possible constructs would still address stakeholders' concerns. In outlining suggestions, stakeholders should address how the suggestion treats all market participants fairly and equally, how it reduces complexity, and how it will continue to ensure that the resource adequacy programs provides the grid with the reliability it has been designed for.

8. Substitution

8.1. Purpose

Resource adequacy resources are expected to be available during the entire month. The replacement rule provides opportunities for resource adequacy resources to take maintenance outages under specific conditions when there is advance notice of the outage. Resources also experience forced outages, when advance notice is not possible. The availability incentive mechanism is designed to provide resources with incentives to undertake actions to reduce the occurrences of forced outages in a month. In order to allow resources to manage their availability incentive risk, the ISO has developed substitution rules that allow capacity from resources to "substitute" for resource adequacy capacity which has experienced a forced outage.. When a resource has a forced outage, for which they were not able to request an outage be approved as an outage with or without replacement, or as an opportunity outage, the resource has the option, under the existing SCP rules and anticipated OMS implementation, to provide substitute resource adequacy capacity to mitigate any potential impact to the original resource adequacy resource's availability incentive calculation. Requests for substitution must be a like for like resource, and must be made before the close of the IFM the day before the substitution takes effect. The ISO approves these substitution requests at its discretion if the resources are similar and in the determination of the ISO the substitution won't impact reliability.

An additional accommodation is allowed in the case of local resources because of their unique situation: local resources may pre-qualify a substitute resource on an annual basis, and such a pre-qualified resource may be substituted in real time. This accommodation is provided to local resources because local resources are often required to provide resource adequacy every month; they may not have the option of not providing resource adequacy for a month in order to perform maintenance or when they suspect that the resource may not be dependable. The option to pre-qualify a substitute resource for a local resource adequacy resource and thus be able to substitute in real time is restricted to a similar resource delivering power to the same bus. In determining whether such a substitution is reasonable there is no need to consider what other resources might be providing resource adequacy or any potential congestion that would

diminish the usefulness of the proposed substitute resource because the substitute resource will deliver similar operating characteristics at the same node.. These requirements are important in allowing real time substitution because the operators are assured that the substitution won't impact the reliability of grid, and don't need to analyze the substitution to determine any potential grid impacts..

8.2. Issues brief

The ISO needs to create substitution rules for flexible resource adequacy resources since this initiative is developing an availability incentive mechanism for flexible resource adequacy resources. Additionally, the ISO has identified two issues related to the substitution rules. The ISO seeks stakeholder feedback on these issues and the relative importance of these issues.
Many-to-many substitution

8.2.1. Many-to-Many Substitution resources

The initial implementation of substitution rules by the ISO required that when a resource was being used as a substitute resource adequacy resource it could not be used as a substitute for another resource adequacy resource. This was true even if the initial substitution used only a small fraction of the non-resource adequacy NQC of the resource. This was an implementation aspect due to restrictions in the ISO's systems for accepting substitutions. This issue was raised over time by several stakeholders. Recently, the ISO has implemented a manual procedure which allows a resource to substitute for a second resource adequacy resource on outage, subject to certain restrictions. The ISO is developing the capabilities required in its various systems to allow for automated many-to-many substitutions without the limits currently imposed with the manual procedure. Once this technology is developed, the ISO will develop revised tariff language to clarify in the tariff how one-for-many substitutions will be accommodated.

8.2.2. Real-time substitution for non-local resource adequacy resources

Current substitution rules allow for the real-time substitution of pre-qualified local resource adequacy resources, but limit which resources may be pre-qualified as substitutes, and does not provide this option for system resources. Stakeholders have suggested that because real-time substitution can reduce the impacts of forced outages on a resource adequacy resource's availably by reducing the hours the resource is unavailable without a substitute, they would like to have a similar option for real-time substitution for system resource adequacy resources. The ISO is concerned that any such expansion of substitution be done without creating potential reliability issues. The existing replacement and substitution rules already provide resources with several methods to minimize any potential availability penalties resulting from forced outages on system resource adequacy resources.

In order for local resource adequacy resources to be eligible for real-time substitution, the potential substitution must meet very specific conditions and be pre-qualified. The ISO allows resources to pre-qualify a substitution on an annual basis when the resources are at the same node and have similar operating characteristics. These restrictions allow the ISO to be certain that there will be minimal reliability impacts in real time due to the substitution.

This is not the same for most system or flexible resource adequacy resource substitutions. The requirements for pre-qualification mean that whatever the condition of the grid is, there are likely to be limited or no reliability impacts resulting from the substitution. For system or flexible resource adequacy resources, unless the substitute resource is also a similar resource located at the same node of the grid, there may be reliability impacts of substituting one resource for another. There may be outages on the transmission grid or congestion that limit the ability of the grid to utilize the MWs that the substitute resource provides.

The existing substitution rules require requests for non-pre-qualified local resource adequacy resources substitutions, and all non-local substitutions to be submitted before the close of the IFM. This provides at least a minimal amount of time for the ISO to analyze the substitution and determine that it does not cause any reliability issues, and to potentially make any adjustments required to ensure that reliability is not reduced.

The ISO recognizes that for system and flexible resource adequacy resources substitution in real time could be allowed for pre-qualified resources which meet the same pre-qualification requirements as applied to local RA resources. The ISO seeks comments on whether this modification would be useful to stakeholders Additionally, the ISO is analyzing whether reduced requirements are possible or if prequalification must at a minimum include similar or higher operating characteristics and the identical transmission node The ISO seeks stakeholder input on whether there might be other requirements for pre-qualification that would be workable..

8.3. Proposed flexible substitution rules

The replacement and substitution rules for system and flexible resources must be designed to work with the structure of these resource adequacy products and the availability calculations. The unbundled nature of system and flexible resource adequacy capacity, which means that a specific MW of capacity may be providing system, flexible or both types of capacity, as well as the proposed single availability calculation for the resource across system and flexible RA, will create potential complications for the structure of replacement and substitution rules. As an example of these types of concerns that must be dealt with, consider how the existing substitution rules may impact flexible resources during the 2015 resource adequacy year. For the 2015 resource adequacy year the ISO has indicated that replacement and substitution rules will not apply for flexible capacity. However, resources that are providing either local or system capacity with the same MWs that are providing flexible capacity are subject to the existing substitution rules for those MWs. The existing substitution rules for system and local resource adequacy capacity under SCP require like for like resources for substitution. If a resource adequacy resource is providing both flexible and system capacity and has a forced outage, any substitute resource provided must meet the like for like requirement of the existing substitution

rules; this means that since the resource is capable of ramping, the substitute resource should also be capable of similar ramping. While the substitute resource won't have to meet a flexible must offer obligation, it must be capable of ramping similarly to the original resource.

As an initial proposal, the ISO envisions that the substitution rules applicable to flexible resources would again be similar to those already in place for system and local resources. Resource adequacy resources will be able to provide substitute flexible resources to avoid potential impacts on their availability incentive calculation. The substitute resource would have to be a similar resource, providing similar capabilities. One possible method of ensuring this is a requirement that the substitute resource must be at least the same category of flexible resource or one with an equal or more stringent offer obligation. Category 1 flexible resources could be substituted for any flexible resource adequacy resource on outage, but category 2 or 3 resources would not be acceptable substitutes for a category 1 flexible resource. The ISO will accept substitution requests when, in its discretion, the substitution will not impact reliability. This may result in additional factors being used to approve substitutions. Substitute resources may also need to be similar resources, which for flexible resources might mean that the substitute resource must have a similar ramp rate. Thus, while a category 1 resource would be able to substitute for a category 2 or 3 resource with respect to the hours of must offer obligation, its ramp rate might also need to be similar to that of the original resource. A resource with a 5 MW/min ramp rate might not be a sufficient substitute for a resource with a 10 MW/min ramp rate under some grid conditions, even though both resources could provide 100 MW of flexibility. As today for system resources, the ISO has the discretion to approve or deny substitution requests in order to maintain reliability. The ISO seeks stakeholder comments on what substitution requirements might be required to maintain reliability.

Similarly, while there is no locational requirement for flexible resources, the provided fleet of flexible resources must be able to provide that flexibility to the entire grid. Conditions on the grid at a specific point in time might make a potential substitution not an appropriate substitute. A substitute resource which is located behind a temporary transmission constraint would not be an appropriate resource because it cannot deliver its flexible capacity, even though it is not on an outage.

The current substitution requirement that any substitution (except for pre-qualified local) must be submitted before the close of the IFM the day before will also apply. The ISO must have time to assess the effectiveness of the substitute resource before the substitution request can be accepted. This will not be possible in real time. As mentioned above, if resources meet the requirements for pre-qualification of a substitution, similar resources located at the same transmission node, then this flexible substitution could be pre-qualified and could proceed in real time.

For substitution, in order for a resource adequacy resource with a forced outage to have the outage excluded from its availability calculation, the substitute resource must provide the same capabilities as the resource on forced outage. Thus, if the resource is providing both system resource adequacy and flexible resource adequacy, the substitution must include a resource capable of providing the same amounts of system and flexible capacity, or multiple resources

that together can provide the same system and flexible capacities. This may create a very complicated substitution structure with potentially multiple resources providing the substitute flexible and system capacity. Determining how these resources will meet the must offer requirements and how the availability incentive mechanism will be applied to each resource may be extremely complex. The ISO seeks stakeholder comments on this process might be simplified.

PART IV: CAPACITY PROCUREMENT MECHANISM

9. Capacity Procurement Mechanism

9.1. Purpose

The CPM is the backbone of the ISO's backstop procurement authority. It is necessary to ensure that the ISO has sufficient capacity available to maintain reliable operation of the grid. It serves three main functions:

- Backstopping RA deficiencies in both the year-ahead and month-ahead timeframes,
- Supplementing RA procurement by load serving entities in order to address reliability needs caused by significant events or when a non-RA resource is exceptionally dispatched, and
- Designating resources who have demonstrated they will shut down in the current year because it will be uneconomic for them to remain in service, but whose operation is projected by the ISO to be needed to meet operational or reliability needs in the year following the year in which the resource would be shut down.

The discussion in this section pertains solely to the ISO's proposal to replace the CPM. If the CPUC adopts a multi-year procurement requirement for their jurisdictional load-serving entities, the ISO will initiate another phase of this stakeholder process, following the CPUC's decision to determine the appropriate backstop mechanism for such a multi-year RA framework.

9.2. Issues brief

The current CPM expires on February 16, 2016. The mechanism and compensation for backstop capacity has been a contentious and complex issue. Much of the debate has revolved around whether CPM compensation was designed to provide incentives for new investment or to buy available non-RA capacity from existing plants. This is one of the fundamental issues surrounding an administrative backstop price for capacity. Currently, the ISO has an administrative rate for CPM designations. Additionally, resources designated under the CPM have the option to file at FERC if they believe that their going forward fixed costs plus 10 percent exceed the administrative rate. The ISO will propose design options for a durable, market-based procurement mechanism and pricing for backstop capacity.

A market-based price for backstop capacity should ideally both efficiently price backstop capacity and provide transparency into the relative value of resource attributes. It should do this based on the location, capability, and time period of the resource adequacy deficiency, as well as changing market conditions. The goal of designing a market-based backstop mechanism is to design one that more efficiently and transparently procures and prices backstop capacity. Currently, the CPM allows the ISO to issue a CPM designation under three different timeframes, annually, monthly, and unsystematically. There are unique challenges to creating a market-based mechanism for backstop capacity in each of these different timeframes.

In their order regarding the ISO's initial CPM proposal, FERC noted that a backstop capacity procurement design should provide a reasonable opportunity to recover fixed costs and reflect fluctuating market conditions.[20] FERC also added that a backstop CPM should support incremental investment by existing resources to perform long-term maintenance or make improvements that are necessary to satisfy environmental requirements or address reliability needs associated with renewable resource integration.[21] The ISO believes that any permanent backstop procurement mechanism would need to be designed with these factors in mind.

Finally, the ISO and stakeholders have spent significant resources in the past, repeatedly redefining backstop procurement processes and compensation. The ISO finds that it is preferable to establish a more durable mechanism through this initiative, based on market design principles.

The ISO has considered several options for a durable, market-based price for CPM designations to address the issues raised by FERC. These range from a highly regulated market-mechanism to an administrative price with index to account for market conditions.

Currently, the ISO is considering the following two primary options:

- Option one - use information provided by the CPUC from the RA bilateral market to establish the price for backstop capacity, and

- Option two - implement a competitive solicitation process.

Option one presents a challenge to develop a transparent mechanism and price using information from the RA bilateral market.

First, because contracts may vary not only in duration (from a single day to multiple years forward), but also in what aspects are included, a price in one contract may not be comparable to another. Nor will it represent a baseline from which replacement capacity should be priced. For example, some capacity contracts come with the obligation for the supplier to replace or substitute alternative resources in an outage. Some capacity contracts also include provisions for energy. A significant variety in terms and conditions will likely be generated. An aggregation of prices would not indicate what aspects are included at a given price and so may not provide adequate assurance of creating an appropriate price for a backstop mechanism.

Second, it may be very difficult to synthetically create a consistently just and reasonable marginal price from an un-standardized bilateral market. The bilateral mechanism to procure capacity may vary from LSE to LSE. Different entities may have different criteria or processes for evaluating which resource or supplier is chosen. If a price is derived from multiple LSE procurement processes, it may no longer be reflective of a specific, transparent process and may create an unintentional black box effect. It may not be possible to validate or show

[20] *California Independent System Operator Corporation,* 134 FERC ¶ 61,211 at PP 57-59 (2011).
[21] *Id.* at PP 57, 59.

evidence that prices were a product of a competitive mechanism. It is unclear what additional information could be provided from the CPUC that would alleviate this concern, and whether there would be inherent restrictions gathering or sharing that information.

Third, if presuming a sufficient supply of similar contracts for capacity is available, the price paid in a bilateral market will most often not represent the price required to secure what capacity remains available. A bilateral market price may not compensate a resource enough to accept the must-offer obligations. In this context we assume that any resource without a RA contract was not contracted because the resource cost was higher than other contracted-for capacity. To adequately compensate the resource to meet must-offer requirements, a sufficiently high price must be derived. A simple price using a high percentile may not appropriately value the remaining capacity. To establish a price based on the bilateral market may require knowledge of what offers were rejected for the specific capacity being sought. This information may be possible to get from the CPUC in the future.

Fourth, FERC's CPM order recognizes that the price of capacity will fluctuate over time due to changing system conditions and the amount of capacity available to meet reliability needs at a given time. Because the date that bilateral RA contracts were entered into will vary, it would not be possible to ensure that the bilateral contract price is reflective of system conditions and capacity availability proximate with the time of the CPM designation.

Option two, a competitive solicitation process, can be tailored to each designation criteria for the CPM and lead to a durable, transparent process, which will create a price reflective of market conditions at or near the time of the designation. For these reasons, the ISO proposes to move forward with option two.

9.3. Existing backstop authority

Under the existing CPM, there are six circumstances where the ISO has the authority to designate eligible capacity to provide CPM services.[22] These are listed in Figure 12.

Figure 12: CPM designation events

1. Insufficient local capacity in an load serving entities' annual or monthly resource plan
2. Collective deficiency of capacity in a Local area
3. Insufficient system capacity in an load serving entities' annual or monthly resource plan[23]
4. Significant event
5. A reliability or operational need for an Exceptional Dispatch
6. Risk of retirement

[22] These are described in detail in Tariff section 43.
[23] This category also allows the ISO to procure backstop capacity where a load serving entity fails to provide replacement capacity to satisfy the so-called Replacement Rule.

Beginning in the 2013 RA year, the ISO created rules that may require LSEs to provide replacement RA capacity for RA resources with planned outages during the RA month. The ISO may use the CPM to backstop any replacement requirements which the LSEs fail to provide to the ISO after a cure period designed to allow them to bilaterally procure their replacement needs.

Additionally, with the implementation of the ISO's FRAC-MOO proposal, the ISO anticipates adding insufficient flexible capacity in an annual or monthly resource plan to the tariff as a criterion for procuring backstop capacity under CPM. Also, if the CPUC adopts a multi-year requirement to their RA program, the ISO would then initiate a stakeholder process to consider adding another CPM designation category in circumstances where LSEs procure insufficient multi-year forward capacity.

9.3.1. Use of existing backstop authority

Tariff section 43 allows the ISO to issue a CPM designation under three different timeframes; annually, monthly, and unsystematically, in the case of a reliability event. In the annual (including risk of retirement) and monthly timeframe, the ISO provides the opportunity for LSEs to cure deficiencies before using the procurement mechanism itself. The opportunity for either LSEs or suppliers to resolve their deficiencies allows market participants to bilaterally contract for capacity at less than the current CPM price. During an exceptional dispatch, the ISO does not provide a cure opportunity because the ISO's need to immediately procure capacity under such circumstances is not compatible with allowing LSEs the additional time required to cure the need through bilateral contracting.

9.4. Proposal summary for new capacity procurement mechanism and price

The following section describes at a high level how a competitive solicitation process might work as an option for CPM replacement. The ISO seeks feedback from stakeholders on whether to pursue this option further and design elements that the ISO should consider when creating a robust competitive solicitation proposal.

The ISO proposes to procure backstop capacity designated under the CPM through a competitive solicitation process similar to the process outlined in tariff section 43.4. The ISO proposes to replace the capacity price term criteria with a procedure for market participants to offer in capacity in the event of a CPM designation. When the ISO needed to designate a resource under the CPM, the ISO would use the competitive solicitation process and pay resources their bid price upon CPM designation. The ISO envisions that some market power mitigation measures will be needed to limit offer prices when there is market power present.

9.5. Competitive solicitation process

The ISO proposes to create competitive solicitation process that will price and designate backstop capacity for all existing CPM designation events. Currently the ISO has provisions in

their tariff on the selection of eligible capacity to designation under the CPM. Section 43.4 states that, per good utility practice, the ISO shall make designations of eligible capacity as CPM capacity under Section 43.1 by applying the following criteria, in the order listed:

- Effectiveness of the eligible capacity at meeting the designation criteria specified in tariff section 43.2,
- Capacity costs associated with the eligible capacity,
- Quantity of a resource's available eligible capacity, based on a resource's PMin, relative to the remaining amount of capacity needed,
- Operating characteristics of the resource, such as dispatchability, ramp rate, and load-following capability,
- Susceptibility of the resource to restrictions as a use-limited resource, and
- Effectiveness of the eligible capacity in meeting local and/or zonal constraints or other ISO system needs, designated under tariff section 43.2.3.

The ISO proposes to use these criteria as the basis for their competitive solicitation process that will designate and pay capacity under the CPM event tariff rules. The ISO will use the current CPM process, combined with a process for soliciting offers, in order to procure and pay capacity under a CPM designation.

Furthermore, in a 2004 order, the commission outlined four rules for evaluating competitive solicitation processes.[24] A competitive solicitation process must involve:

- Transparency,
- Defined products,
- Evaluation criteria, and
- Independent oversight.[25]

In developing their potential competitive solicitation process, the ISO will seek to ensure that it follows these four principles.

[24] *Allegheny Energy Supply Co*., 108 FERC ¶ 61,082 (2004) (*Allegheny*).
[25] *Allegheny*, at P 22.

9.5.1. Annual backstop designation process

The ISO would continue the current timeline and process for the annual CPM assessment. The ISO proposes to add a process for soliciting competitive offers for annual backstop capacity. The CPM designation would continue, subject to tariff section 43.3.1 and 43.3.3.

Figure 13: Annual RA timeline with competitive solicitation process

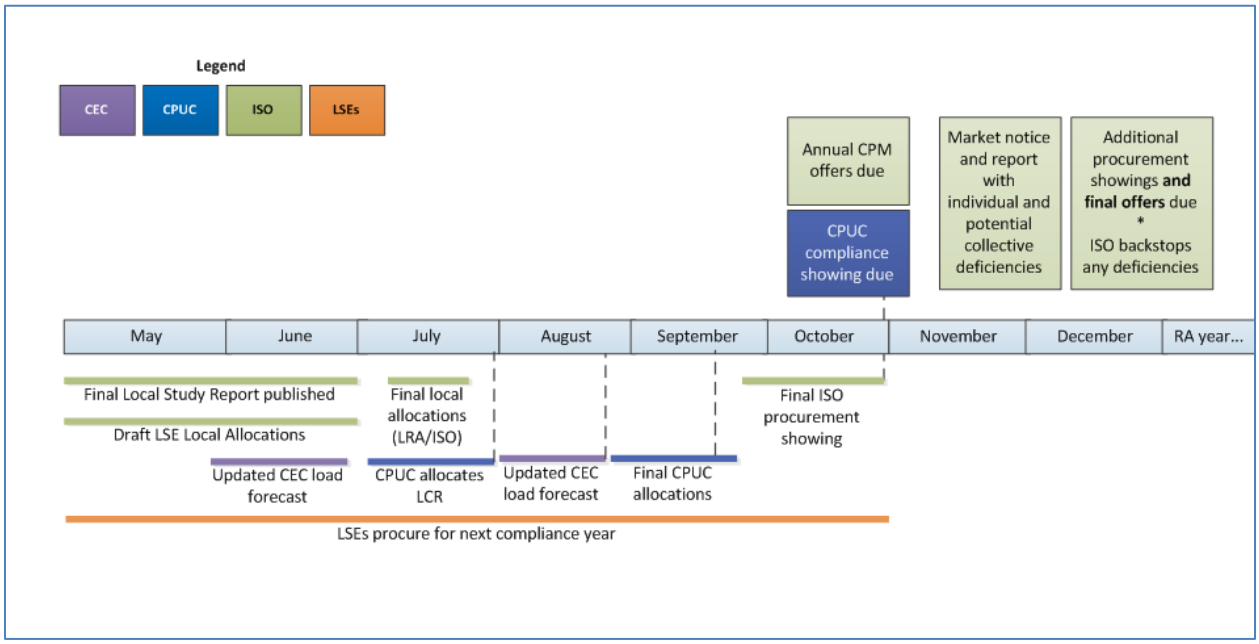
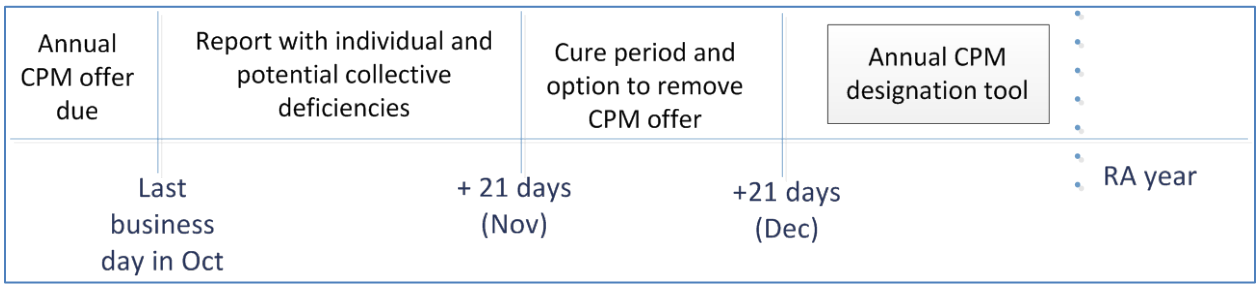


Figure 13 shows the current annual RA timeline with all the agencies involved. The initial offers for annual CPM backstop would be due at the same time as the compliance showing. During the cure period, the market participant would have the option to remove any previously offered capacity if it was subsequently sold or otherwise no longer available as backstop RA capacity. In the event of a deficiency for annual capacity, the ISO would run the annual CPM designation tool to procure needed capacity and pay any procured capacity their offer price.

The ISO seeks stakeholder feedback on how the resource offer should be solicited. At this time, the ISO envisions a supplier would indicate a single offer price for all MW's of a resource's capacity, the resource characteristics, and how much capacity the resource was willing to offer as flexible and generic capacity.

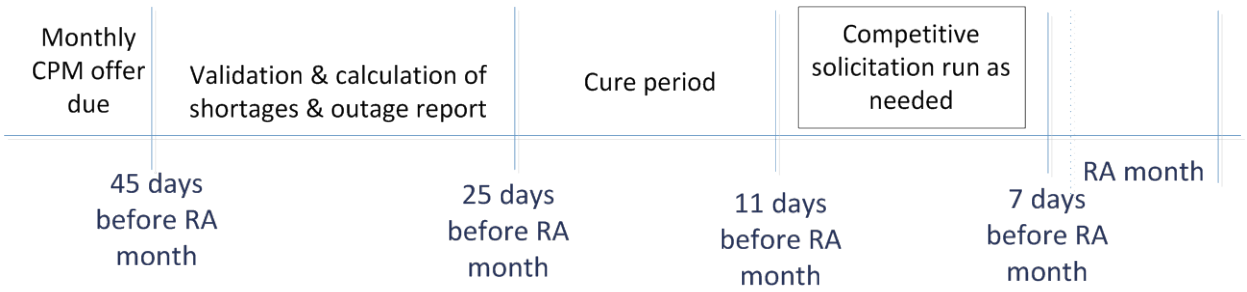
Figure 14: ISO RA timeline and competitive solicitation process with CPM designation tool



9.5.2. Monthly backstop designation process

The monthly CPM designation process would be the same as that currently in the ISO tariff, except that the ISO proposes to add a process for soliciting competitive offers for monthly backstop capacity. Monthly CPMs would continue to follow the terms under tariff section 43.3.2. Figure 15 shows where the ISO proposes to insert the competitive solicitation process.

Figure 15: Monthly RA timeline with competitive solicitation process



The ISO would solicit offers for capacity and close the offer period by 45 days prior to the month. Offers would have their price locked until after seven days prior to the next month; however, suppliers would have the opportunity to completely remove their offer from the competitive solicitation process in the event they were able to bilaterally contract the capacity.

The ISO would validate shortages and conduct the outage report. Any shortages will give the opportunity to cure until 11 days before the RA month. If a shortage is not cured, the ISO will have the option to designate a resource under the one of the monthly CPM events. The ISO would use the criteria outlined under tariff section 43.4 and the monthly offers to designate and pay capacity to resolve the deficiency.

9.5.3. Exceptional dispatch and significant event backstop designation process

The ISO proposes to use offers from the monthly competitive solicitation process if it must designate a resource under an exceptional dispatch or significant event CPM. These offers will be locked in from 45 days prior to the month and may only be removed after seven days prior to the month. In no event can the offer price in the monthly solicitation process be changed until the next monthly solicitation. The ISO believes that the proposed approach best balances two goals. In capacity offers, it reflects market conditions that are as current as possible. This is balanced against the fact that exceptional dispatches and significant events often require the ISO to make prompt backstop procurement decisions and do not allow the ISO time to conduct a separate competitive solicitation for a particular significant event or exceptional dispatch.

Under the existing tariff, the initial designation term for a significant event is 30 days. The ISO can automatically extend the term by an additional 60 days if it believes the significant event will extend beyond the initial term. During the additional 60-day period, the ISO gives market participants the opportunity to provide alternative solutions to the designation of CPM capacity to meet the ISO's operational and reliability needs caused by the significant event. If the ISO finds an alternative to fully or partly remedy the significant event, it can implement that instead of extending the significant event designation.

CPM designations resulting from exceptional dispatches to address a system reliability need have an initial term of 30 days. The ISO can automatically extend if for another 30 days if it believes the circumstances that led to the exceptional dispatch are likely to extend beyond the initial term. CPM designations resulting from exceptional dispatches to address a non-system reliability need have an initial term of 60 days, which the ISO can automatically extend for another 60 days if it believes the circumstances that led to the exceptional dispatch are likely to extend beyond the initial term.

In this initiative, the ISO will re-consider the appropriate term for significant event and exceptional dispatch designations. Stakeholders should comment on this issue and provide support as to why their recommended designation terms are appropriate.

The ISO will consider having separate market power mitigation measures for the intermonth CPM designations. This could have the effect of further changing the offer set after seven days before the month. We request stakeholder comments on these issues and seek specific recommendations regarding any particular proposed mitigation measures.

9.5.4. Risk-of-retirement backstop designation process

The ISO will use the current tariff rules to designate a resource under the risk-of-retirement CPM. In addition, in order to qualify for a risk-of-retirement CPM, a resource must have offered all qualified RA capacity into all CPM solicitation processes. This includes both the annual, monthly, and inter-monthly processes. This should ensure that any resource asking for a risk-of-retirement designation has done everything possible to get a RA contract. When a resource

does qualify to receive a risk-of-retirement designation, the resource will then be compensated using their annual competitive solicitation offer.

9.6. Market power mitigation

The ISO believes that market power mitigation measures in some form will be necessary in the competitive solicitation process. Market power mitigation can take several forms. First, there can be market power on the supply-side or demand-side. Second, the mitigation measures can range in complexity and stringency. Given the range in events and time that a CPM designation may cover, it may be appropriate to have different market power mitigation measures for different CPM events. The ISO expects the potential for market power to be much greater in an exceptional dispatch situation than in the event of a monthly RA deficiency, for example. It may also be appropriate to use multiple mitigation measures at one time. At this time, the ISO does not propose a specific path forward, but instead describes potential measures for stakeholder consideration and requests that stakeholders provided detailed comments regarding appropriate mitigation measures.

For supply-side market power, the ISO has identified three potential mitigation measures:

- **Limits on bidding flexibility within the competitive solicitation process.** The ISO envisions that, at a minimum, a supplier must offer in capacity at a price before a deficiency is determined. The supplier would not have the flexibility to change their original offer price. If, in the interim, the supplier sells their capacity, the supplier could remove the offer completely, subject to verification of the sale. An additional option would be for suppliers only to be able to offer a single price per MW for all solicitation processes within the RA year. The offer price submitted in the annual competitive solicitation process would therefore apply to all capacity offered into any subsequent (for instance, monthly) solicitation process.

- **An assessment of market power within the competitive solicitation process.** As an alternative or in addition to one or more of the other market power options discussed here, the ISO could potentially assess market power within each solicitation process. It could then apply appropriate resource-specific mitigation measures to any capacity that was assessed to have market power. One option would be a three-pivotal supplier test. The market power assessment could evaluate both local market power and capability market power. Capability market power is where the ISO needs a specific attribute from a resource, such as a fast ramp rate, and there are a limited number of resources (or only a single resource) that have this needed attribute. Given the new flexible capacity requirement, the ISO expects that it will become increasingly important to assess market power in connection with resource capabilities, in addition to local market power.

- **An offer cap on all capacity offers.** Since market power is likely to exist in a competitive process for residual capacity, the ISO could automatically mitigate all bids to a fixed or varying offer cap. This offer cap could vary not only from the annual process to monthly processes, but also from year to year, in order to reflect market conditions.

An offer cap could be derived through several mechanisms. First, it could be derived from the expected marginal resource's cost and profit requirements. This would require an analysis to determine both the marginal resource type each month and what the appropriate associated costs would be for that generic resource type. Second, the ISO could use bilateral market data provided by the CPUC. This would require an analysis of which prices should be used to derive an offer cap in each competitive solicitation process. Third, the ISO could establish an offer cap based on net-CONE. Thise latter may be difficult to justify to FERC in the context of competitive solicitation processes that procure capacity for less than an annual contract.

The ISO does not propose a specific measure at this point for supply-side market power, but seeks market participant input on this issue. We encourage specific proposals from stakeholders, along with the reasons supporting any specific recommendation.

Traditional demand-side market power issues are unlikely to arise in the competitive solicitation framework contemplated by the ISO. First, under the ISO's proposal, market participants' bidding capacity would be paid their offer price, not a market clearing price. Additionally, LSEs would have no option to self-supply through the process. This is because there is no requirement that all capacity under contract clear through a market in order to be counted as RA capacity. These factors would seem to significantly reduce the incentive for suppliers that are also LSEs to offer in their capacity at an artificially low price in order to suppress prices. The ISO welcomes stakeholders' comments on this issue. One possibility for consideration would be a generic price floor applicable to all backstop capacity. This would ensure that all capacity procured through the competitive solicitation would meet some minimum threshold of competitiveness for reliability products.

10. Next Steps

The ISO will discuss this draft straw proposal paper with stakeholders during a meeting on June 12, 2014. Stakeholders should submit written comments by June 26, 2014 to RSA@caiso.com.