



Memorandum

To: ISO Board of Governors

From: Anna McKenna, Interim Vice President, Market Policy and Performance

Date: March 17, 2021

Re: Decision on Resource Adequacy Enhancements Phase 1

This memorandum requires Board action.

EXECUTIVE SUMMARY

Since October 2018, Management has engaged stakeholders in a comprehensive review of the ISO's resource adequacy requirements to ensure the ISO's resource adequacy program continues to reliably and sustainably support the needs of the transforming grid all hours of the year. Last August's load-shed events further highlighted the need to enhance resource adequacy rules and tools to reliably serve load during stressed conditions. Management has identified three changes to implement in this first phase of the resource adequacy enhancement initiative in furtherance of these goals. Two of these changes would be implemented by this summer and one would be implemented by resource adequacy year 2022. Management will continue to consider more comprehensive changes to the ISO's resource adequacy program and will bring further proposals to the Board of Governors in subsequent phases.

For this summer, Management proposes to implement (1) a minimum state of charge requirement for resource adequacy storage resources that will be in place on an interim basis while the ISO and stakeholders consider market enhancements to better manage storage resources as key reliability resources; and (2) enhancements to the existing planned outage process that will better ensure planned outages are fully replaced with substitute capacity. Both of these changes can be implemented quickly to provide greater assurance resources providing resource adequacy capacity are available when and where needed to meet system and local needs beginning this summer.

The interim minimum state of charge requirement will ensure that on critical tight supply days, storage resources providing resource adequacy capacity will be sufficiently charged in the real-time market to meet day-ahead discharge schedules when needed to meet the evening net-load peak. Management will also launch a new policy initiative

to consider further reforms and market-integrated techniques to manage storage devices to replace this interim solution.

The proposed changes to the planned outages process will ensure a resource adequacy resource that requests a planned outage provides substitute capacity for the resource to take the planned outage during the month it is providing resource adequacy capacity. This will reduce reliability risks during the upcoming summer months while providing assurances that planned outages can be taken when scheduled, ensuring sufficient resource adequacy capacity is procured in advance of the outage, and avoiding last minute or uncertain capacity substitution obligations.

Management also proposes to expand its local capacity procurement mechanism backstop authority to ensure sufficient energy in local capacity areas, which will be implemented for the 2022 resource adequacy year. The proposed change will enable the ISO to procure resources when it identifies a need for additional local resource adequacy capacity after an area or sub-area fails to meet an energy sufficiency evaluation performed during the local capacity technical study. As “availability- and energy-limited resources” make up an increasingly greater share of resource adequacy capacity in local areas, it is critical the ISO ensure the shown resource adequacy resources have sufficient energy available, in addition to capacity, to meet the local area load serving needs.

Management proposes the following motion:

Moved, that the ISO Board of Governors approves the resource adequacy enhancements phase one proposal described in the memorandum dated March 17, 2021; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposals described in the memorandum, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Commission guidance in any initial ruling on the proposed tariff amendment.

DISCUSSION AND ANALYSIS

1. Minimum State of Charge Requirement

Management anticipates close to 2,000 MW of storage available for dispatch on the system by summer 2021, up from about 200 MW during the previous year. This number will continue to rapidly grow as more natural gas facilities and the Diablo Canyon nuclear generating facility retire in the next few years. As a result, the ISO will increasingly rely on storage resources to meet the capacity and energy needs of the

system across the critical net load peak period, which is the period in the day when solar coverage is dropping faster than load.

Today the real-time dispatch issues financially binding instructions to resources participating in the ISO market by anticipating grid needs only up to 1 hour in the future for unit commitment and advisory dispatch purposes. Most storage resources charge and discharge at about the same rate. For example, a typical storage resource scheduled to discharge for a 1 hour period at full output would require about 70 minutes to charge at the maximum charging capability. This implies that storage resources needed for discharge beyond about 30 consecutive minutes may not have sufficient time to charge in the real-time market, which could jeopardize the ISO's ability to manage the system reliably if the ISO is relying on those resources to serve load during the critical net load peak period.

Management proposes to implement a procedure called the minimum state of charge requirement to mitigate the risk of insufficient state of charge from storage resources shown for resource adequacy in the real-time market. On critical days, the procedure will require resource adequacy storage resources to meet their day-ahead discharge schedules during a pre-specified set of critical hours. Because the day-ahead market optimizes over a 24-hour future time horizon, it includes optimal charge and discharge schedules for storage resources, and the day-ahead market will always satisfy needs in periods when storage is critical to maintain system reliability. To the extent that the day-ahead forecast is accurate, day-ahead storage schedules will include sufficient energy to ensure the ISO can meet system needs in real-time, particularly across the net load peak period.

The procedure will only limit resource adequacy storage resources in this manner on those limited instances across the year when the residual unit commitment process cannot balance supply and demand. Management is proposing to limit the use of the minimum state of charge procedure to such days in response to concerns by the stakeholder community that applying this procedure on all days of the year would have imposed significant restrictions on when and how storage resources operate in the real-time market. The relaxed requirement limits the instances in which the ISO would limit such flexibility while ensuring resource adequacy storage resources state of charge is aligned with grid reliability needs. To the extent the minimum state of charge requirement itself does not sufficiently address reliability concerns, Management anticipates ISO operators will take necessary out-of-market actions to ensure sufficient state of charge to maintain grid reliability.

Management proposes the minimum state of charge procedure be an interim measure no later than 2023 when the provisions will be replaced through a more market integrated approach, which would also better address compensation and incentives for ensuring storage resources are fully charged when needed. Management will launch a new initiative this year to develop a market-integrated approach to address the availability and use of storage resources.

2. Planned Outage Process Enhancements

Management proposes changes to the planned outages process to ensure the scheduling coordinator for the resource adequacy resource requesting a planned outage provides substitute capacity in order for that resource to take the planned outage during months it is providing resource adequacy capacity. The current planned outage process allows resource adequacy resources to submit planned outage requests months in advance. However, given that the resource adequacy program operates on a monthly construct, this timing can be problematic since the ISO does not know what resource adequacy resources will be available to operate the grid until 45-days prior to the resource adequacy compliance month when resource adequacy showings are due. If a resource adequacy resource wants to take a planned outage and count as a resource adequacy resource in a compliance month, the ISO is unable to tell the resource whether or not substitute capacity is required until 20 days prior to the compliance month because the ISO must first study and assess the resource adequacy fleet shown for that month. During the time between the resource's planned outage request and the ISO's study, the resource does not know if substitute capacity will be required in order to take the planned outage. This process can result in the ISO denying planned outages if substitute capacity is needed and not available at this late juncture. This is impactful to the resource and the resource's outage planning process and to the ISO having to deny and defer needed planned outages.

Management's proposal rests on the foundation that resources that sell resource adequacy capacity have agreed to provide that capacity to the ISO. If a resource adequacy resource is unavailable to the ISO due to a planned outage, the resource should (1) have an obligation to find substitute capacity to replace its unavailable resource adequacy capacity, (2) not be shown as resource adequacy in that month in the first instance and take the planned outage, or (3) face the financial and regulatory consequences, such as penalties, capacity derates, or potential FERC actions. Conversely, if another resource is available when a resource adequacy resource wants to take a planned outage, then that non-resource adequacy capacity should be shown and compensated for resource adequacy for stepping in and taking on the resource adequacy commitment to be available to the ISO.

The current resource adequacy planning reserve margin does not account for capacity unavailable due to planned outages. Planned outages are not currently contemplated in the planning reserve margin because it assumed that substitute capacity will be provided for these outages.¹ Therefore, any resource adequacy planned outages without substitute capacity come at the expense of the planning reserve margin. The Root Cause Analysis report on last summer's heat wave events found that substitute capacity is not always provided for planned outages. Requiring substitute capacity for all resource adequacy resources will help to ensure that the ISO has adequate resource adequacy capacity in all resource adequacy compliance months. Even if the resource provides substitute capacity,

¹ The Final Joint Root Cause Analysis determined that the planning reserve margin would need to be an additional two percent to account for planned outages. <http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf> at p. 43.

the outage may still be denied if the ISO's reliability assessment shows that the requesting resource is uniquely needed for reliability, such as a local reliability need.

Management also proposes to change how it handles requests for extending planned outages. Currently resources on planned outages that request an outage extension are typically granted. The basis for this is that denying the outage does not change the fact that the resource remains on outage. However, Management proposes that planned outage extension requests be submitted under a new outage request ticket rather than an extension. This will enable better tracking of planned outage extensions and should improve incentives to complete planned outages in a timely manner by increasing the potential costs of extending outages.

3. Capacity Procurement Mechanism Authority for Local Capacity Area Energy Sufficiency

Each year, the ISO conducts a local capacity technical study pursuant to its tariff to determine the minimum amount of local capacity area resources needed to meet local area reliability needs during unforeseen contingency conditions. This requirement reflects a capacity value in megawatts without full consideration of local area resource constraints, such as limits on energy, duration, or number of dispatches.

Today, availability-limited resources have a minimum duration requirement of four hours to qualify as resource adequacy capacity. Therefore, a 10 MW resource that is capable of producing for 4 hours, or 40 MWhs, has the same resource adequacy capacity value as a 10 MW resource capable of producing for 8 hours, or 80 MWhs. However, if a local capacity area requires 10 MW of capacity for an eight-hour period during a contingency event, only the latter is capable of meeting this reliability need. As a result, the ISO may have sufficient capacity in MWs to meet peak demand needs in a local capacity area but insufficient energy in MWhs to meet needs across all hours of the day and year.

In recent transmission planning studies, specifically the Moorpark and Santa Clara local capacity sub-areas in central California, the ISO developed and performed detailed hourly load and resource analyses to assess whether there were binding availability limits in these local capacity sub-areas.² These studies show that availability-limited resources with a four-hour minimum duration were insufficient to meet the energy (*i.e.*, total MWhs) required to address contingency events identified in the ISO's local capacity criteria. Currently, the ISO does not have the tariff authority to use its local capacity procurement mechanism backstop to fulfill energy deficiencies identified in these local capacity studies.

² ISO, Moorpark Sub-Area Local Capacity Alternative Study, August 16, 2017, http://www.ISO.com/Documents/Aug16_2017_MoorparkSub-AreaLocalCapacityRequirementStudy-PuentePowerProject_15-AFC-01.pdf; and Santa Clara Sub-Area Local Capacity Technical Analysis, June 18, 2018, <http://www.ISO.com/Documents/2023LocalCapacityTechnicalAnalysisfortheSantaClaraSub-Area.pdf>

Management proposes to modify its tariff rules for local capacity technical studies to reflect this energy sufficiency criteria, as well as its capacity procurement mechanism authority to procure additional capacity in the annual timeframe after a local area or sub-area fails to meet the energy sufficiency test. If the ISO identifies any capacity or energy shortfall, it will provide a cure period for load-serving entities to clear any deficiencies before exercising its backstop procurement authority. Management will request these changes take effect for the 2022 resources adequacy year.

POSITIONS OF THE PARTIES

The stakeholder process provided significant opportunity for collaboration between the ISO and stakeholders. This initiative began in October 2018 and concluded with a final proposal in February 2020. In total, the ISO has held eight in person stakeholder conferences and ten web conferences for the resource adequacy enhancements initiative and provided stakeholders with eleven opportunities for comment on phase one elements. Management thanks stakeholders for their significant engagement and providing valuable expertise and input that helped shape the final version of this proposal.

The following summarizes stakeholder comments received on the minimum state of charge requirement, planned outage process enhancements, and capacity procurement mechanism authority for local capacity area energy sufficiency.

Stakeholders appreciated efforts by the ISO to evolve the minimum state of charge requirement proposal over the course of the initiative in response to stakeholder feedback. While some stakeholders in the storage community expressed concern that the procedure may prevent full participation in the real-time market, stakeholders support the ISO's proposal to sunset the minimum state of charge requirement no later than two years and begin a new initiative this spring to explore how to better optimize storage resources using a more market-integrated approach. Management believes the proposal strikes a reasonable balance between ensuring adequate state of charge from storage resources to meet net load peaks under tight system conditions while providing storage resources flexibility to participate in the real-time market.

Stakeholders expressed concern with the ISO's proposal to require substitute capacity for planned outages, stemming from the belief that there may not be sufficient capacity available to substitute. Other stakeholders asserted that the ISO should not require substitute capacity because there is adequate non-resource adequacy capacity available. Others wanted to limit the substitution obligation to summer months. Management's proposal rests on the foundation that resources that sell resource adequacy capacity have agreed to provide that capacity to the ISO in that resource adequacy compliance month. Some stakeholders also expressed concern that the proposal will result in an incremental increase in load serving entities "holding back" capacity from the bilateral capacity market in the event they need to provide their own substitute capacity. Although the ISO is working to remove resource adequacy capacity withholding incentives in the resource adequacy enhancements initiative, on balance, the ISO

believes that this first phase of the planned outage substitution proposal will ensure adequate resource adequacy capacity is always available and will help reduce the risk of the ISO canceling planned outages very late in the process.

Most parties supported the ISO's proposal to expand backstop authority to cure local energy deficiencies. PG&E and SDG&E did not oppose the principal of the policy, but argued for further refinements of the local technical studies, cost allocation methodology, and to improve transparency so that load serving entities are aware of which resources are available to cover any identified deficiencies. At this time, Management does not plan to update the cost allocation methodology for local collective deficiencies, but may do so in the future. Management will continue to work with stakeholders to make sure they understand the energy requirements for local areas and know the resources available to meet those needs to minimize backstop procurement risks.

CONCLUSION

The resource adequacy enhancements phase one proposal will drive greater resource adequacy fleet operability and dependability all hours of the year by providing greater assurance resource adequacy resources are available when and where needed to meet system and local reliability needs beginning this summer. Management requests the Board approve the following items in this proposal: (1) the minimum state of charge requirement, (2) planned outage process enhancements, and (3) capacity procurement mechanism authority for local capacity area energy sufficiency.