Memorandum

To: ISO Board of Governors

From: Mark Rothleder, Vice President, Market Policy and Performance

Date: July 15, 2020

Re: **Decision on slow demand response and proxy demand resources proposal**

This memorandum requires Board action.

EXECUTIVE SUMMARY

Pursuant to a 2016 ISO Executive Appeals Committee decision regarding a business practice manual revision and a resulting multi-year stakeholder process to fulfill the decision, Management has developed an operational solution to enable slow response proxy demand resources (PDR) located in local capacity areas to be dispatched prior to a contingency and by doing so, qualify as local capacity resource adequacy resources.

This memorandum seeks approval for tariff revisions necessary to implement the settlement of slow demand response PDRs, which will be exceptionally dispatched following the day-ahead market as a preventative measure to avoid possible overloads and NERC violations in meeting local capacity area reliability needs. Unlike other resource types[1] that can be committed to start up and maintain a minimum load level, slow demand response PDRs are unique and generally cannot be "started" in a timely manner and held at a minimum load level. Instead they require sufficient notification time prior to when they are needed to respond. As a result, the ISO proposes a process for evaluating needs not resolved by the day-ahead market and issuing an exceptional energy dispatch notice post day-ahead to provide sufficient dispatch notification. To operate and settle slow demand response PDRs, tariff changes are needed to clarify how the exceptional energy dispatch will be treated and settled for these resources. The following outlines the major components of the proposed slow demand response PDR solution methodology:

[1] Storage devices are also unique resources and may not have a minimum load level, but they are also not "slow responding," which means they can respond to local capacity area contingency conditions post-contingency, and they do not have to rely on this same "preventive" exceptional energy dispatch functionality proposed here as does slow responding PDR.

1. Scheduling coordinators for load-serving entities and for demand response providers show their slow demand response PDR on their resource adequacy plans and supply plans, respectively;

2. Prior to the day-ahead market, the ISO defines constraints and reliability needs in local capacity areas;

3. The day-ahead market runs with local area constraints and reliability needs and assesses whether there are sufficient resources and import capability in a local capacity area to meet reliability requirements without using the shown local area slow demand response PDRs;

4. After the conclusion of the day-ahead market, if there is a shortfall in generation and import capability to meet local capacity area reliability needs after considering all awards and commitments in the day-ahead market (which can include PDRs that were awarded in the day-ahead market), the ISO will exceptionally dispatch any remaining uncommitted slow demand response PDR utilizing current exceptional dispatch tariff authority prior to the operating day;

5. The slow demand response PDR will settle using an exceptional dispatch energy settlement price based on the greater of the resource's day-ahead bid price or the real-time fifteen minute market locational marginal price (LMP).

Management proposes the following motion:

> ***Moved, that the ISO Board of Governors approves the tariff revisions necessary to implement the slow demand response and proxy demand resources proposal as described in the memorandum dated July 15, 2020; 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 proposed deliverability methodology revisions, 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

For reliable operation of the grid, the ISO depends on adequate supply from resources located in local capacity areas to meet demand all hours of the year. Demand response resources can help support the system in local capacity areas by reducing load, thus requiring less electricity supply when the local area is supply constrained and would otherwise be in jeopardy should a contingency occur.

Certain demand response resources have limiting characteristics and limited availability that challenge their usefulness as local capacity resources. Additionally, they often require significant advance notice of a potential dispatch to be able to meet the local capacity area requirements so that the ISO can effectively access them to address contingencies. The ISO has defined "slow" demand response as demand response resources that cannot fully respond to an ISO dispatch instruction within 20 minutes after a contingency, or when the system enters an N-1 insecure state (loss of a single critical element) to reposition the system to a safe operating level in preparation for the next N-1 contingency event. Specifically, slow demand response cannot be "started" like a generator and be ready to respond to an ISO dispatch instruction within 20 minutes once a local area contingency occurs. Slow demand response resources are unique from other resources because they require a "notification time" before they can respond to an ISO dispatch instruction.[2]

NERC standards and the ISO tariff specify a maximum time of 30 minutes after a first contingency to prepare the system for a subsequent contingency. This response time accounts for the minimal amount of time the ISO operators have to perform their real-time assessment to reposition the system within safe operating limits. After a contingency strikes and a real-time assessment occurs, the ISO is left with approximately 20 minutes for resources to provide generation or load drop within the overall 30-minute timeframe. To meet local resource adequacy needs, resources must either:

1. Be capable of responding quickly enough such that the ISO can rebalance and reposition the system within 30 minutes of a contingency event; or
2. Have sufficient availability such that the resource can be dispatched on a pre-contingency basis as a preventative measure

By definition, slow demand response PDR cannot respond quickly enough to satisfy the first option. However, ISO planning studies have indicated that at current demand response penetration levels, existing slow demand response PDR generally has the required availability to satisfy the second option.

The slow demand response PDR effort was initiated as a result of a 2016 business practice manual (BPM) revision appeals decision in which the ISO committed to initiate a stakeholder process to develop a way to operationalize slow demand response resources. Doing so would allow these resources to remain eligible to provide local resource adequacy capacity and be used by the ISO when needed for local reliability needs. This resulted in the development of a new process to dispatch slow demand response PDR on a pre-contingency dispatch basis using a post-day-ahead market solution. The new process will dispatch slow demand response PDR after the day-ahead market runs, by assessing local area load and available resources. When the

[2] Notification time refers to the time required for a resource to go from its Pmin (generally zero megawatts for demand response) to responding to a dispatch instruction. This differs from startup time, which is the time period required for a resource to go from offline to its Pmin level

assessment determines that there is a shortfall in generation and import capability in the local area to meet the local area reliability needs, the ISO will efficiently issue exceptional dispatches to slow demand response PDR resource adequacy resources to make up for the shortfall upon conclusion of the day-ahead market.

The new slow demand response PDR process leverages the ISO's existing minimum online commitment constraint in the day-ahead market to efficiently determine when pre-contingency dispatching of slow demand response PDR is needed. Minimum online commitment constraints are market constraints enforced in the day-ahead market used to ensure sufficient units are committed to effectively address potential contingencies. The minimum online commitment helps ensure real-time reliability by committing resources in the day-ahead market to ensure system reliability following a contingency in real-time. ISO engineers define minimum online commitment constraints through engineering analysis to identify the minimum generation capacity requirements within local areas. While the minimum online commitment on its own cannot operationalize slow demand response for local needs, monitoring the ability to meet the minimum online commitment will be used to identify when slow demand response PDRs are needed.

When the minimum online commitment requirement cannot be met through commitment of available resources excluding slow demand response resources, the ISO will exceptionally dispatch local slow demand response PDR resource adequacy resources to meet the minimum online commitment insufficiency after the day-ahead market run. The ISO will dispatch the resources for energy, rather than committing them to start and go to a Pmin level, based on their bids submitted into the day-ahead market and their ability to resolve the local area need.

Because the ISO will dispatch slow demand response resources before a contingency occurs, as a preventive measure, the energy dispatches awarded to slow demand response PDRs must be maintained through real-time to preserve the pre-contingency dispatch. This informs slow demand response resources prior to the operating day the hours and the amount of load they are required to reduce.

Management proposes to settle the slow demand response PDR exceptional energy dispatches based on the higher of the resource's day-ahead market bid price or the real time fifteen minute locational marginal price. The post-day-ahead market process will select which slow demand response PDR to dispatch based on its day-ahead bid price and issue the exceptional dispatch prior to the operating day. This new tariff provision is needed because slow demand response PDR is the only resource type that requires a day-ahead energy exceptional dispatch (rather than just a commitment to start up and go to Pmin).

It is important to note that the ISO's new pre-contingency dispatch process requires the slow demand response PDRs providing resource adequacy to be shown on resource adequacy supply plans. Currently, the CPUC counts slow demand response as local resource adequacy through a "crediting" mechanism. The CPUC's crediting practice lowers the

resource adequacy requirements of load serving entities, but does not require CPUC jurisdictional load serving entities to show demand response resources on their resource adequacy plans. This practice prevents the ISO from applying its resource adequacy tariff provisions to demand response resources, including slow demand response PDRs. As a result, without an explicit showing of the demand response in the resource adequacy plan, the ISO is unable to account for demand response resource adequacy resources in its resource adequacy market systems.

In order for this new process to be technically feasible and effective, these resources must be shown to the ISO on supply plans as resource adequacy capacity. In the CPUC's resource adequacy proceeding, the ISO has provided a deep record on this particular issue and has petitioned the CPUC on the reasons why demand response that counts as resource adequacy capacity must be included on resource adequacy supply plans for the ISO to properly manage the operation of these resources under its tariff.[3] The CPUC has deferred further discussion on this matter until a future proceeding.

POSITIONS OF THE PARTIES

Stakeholders did not submit comments expressing opposition or support of the proposed method for settlement of slow demand response pre-contingency dispatch or how the settlement price for resources receiving an exceptional dispatch energy instruction prior to the operating day would be set. This unopposed element is the only aspect of this proposal that requires Board approval.

All stakeholder comments received were on the new ISO process to dispatch slow demand response PDR on a pre-contingency dispatch for which the ISO already has tariff authority. These additional party positions have been provided below as context to the broader discussion:

Stakeholders are generally supportive of Management's efforts to integrate "slow" demand response PDR as a local capacity resource as a remedy to the ISO 2016 BPM appeals committee decision. Several stakeholders have expressed support that if a local capacity resource adequacy resource cannot respond within the required time period, the resource "should either not count towards meeting local requirements or be dispatched before the limiting contingency occurs."

Additionally, some stakeholder comments were supportive of Management's request that Investor Owned Utilities start showing their demand response resources on their resource adequacy supply plans as is required of all other resource adequacy resources, including third party offered resource adequacy demand response resources. Stakeholders, in opposition to these local resource adequacy resources

[3] Track 2 Proposals: http://www.caiso.com/Documents/Feb21-2020-ResourceAdequacy-Track2-Proposals-R19-11-009.pdf, and Track 2 Reply Comments: http://www.caiso.com/Documents/Apr2-2020-ConsolidatedReplyComments-Track2Workshops-Proposals-ResourceAdequacy-R19-11-009.pdf

being shown on a supply plan, maintain that the slow demand response PDR resources are available for dispatch through the markets and should not be subject to this resource adequacy requirement. Without being shown on a supply plan, these demand response resources are not subject to the ISO's resource adequacy tariff provisions like all other resource adequacy resources.

Stakeholders submitting comments opposing the slow demand response proposal base their opposition on its exclusion of slow reliability demand response resources from providing local RA, particularly if resources can timely respond "statistically" with a portion of their full capability within 20 minutes after a contingency. These resources are subject to strict dispatch rules and are only dispatched under emergency grid conditions, which is problematic under the new proposed pre-dispatch process for slow demand response resources. Furthermore, this type of "partially" local resource adequacy resource would be problematic for the ISO and CPUC to manage.

Comments were also received which neither supported nor opposed the proposal but expressed a general concern about demand response participation as resource adequacy resources including how they are modeled and used within the markets.

CONCLUSION

Management requests Board approval of the new settlement provisions necessary to implement the new process for pre-contingency exceptional dispatches of slow demand response PDRs. The new provisions are necessary to facilitate the pre-contingency dispatch solution developed to enable slow demand response PDR to qualify as resource adequacy capacity in the local capacity areas in compliance with NERC standards.

Implementation of the slow demand response pre-contingency dispatch solution also satisfies the ISO 2016 BPM Executive Appeals Committee decision.

For these reasons, Management recommends that the Board approve the tariff modifications described in this memorandum.