

October 22, 2021

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: California Independent System Operator Corporation
Filing of Joint Owned Unit Pilot Agreement
Docket No. ER22-____-000**

Dear Secretary Bose:

The California Independent System Operator Corporation (“CAISO”) submits for filing and acceptance an agreement, the Joint Owned Unit (“JOU”) Pilot Agreement (“Agreement”), dated October 21, 2021, among the CAISO, the Public Service Company of New Mexico (“PNM”) and Tucson Electric Power (“TEP”).¹ The Agreement sets forth the terms under which the CAISO will model a single resource located in the PNM balancing authority area shared by PNM and TEP, and how the PNM and pseudo-tied TEP resource shares located in separate balancing authority areas will participate in the Energy Imbalance Market on a pilot basis (“JOU Pilot”). The JOU Pilot is an integral component of TEP’s participation in the EIM starting on April 1, 2022.

The objective of the JOU Pilot is to enable PNM’s and TEP’s individual resource shares to participate in the market through enhanced modeling that accounts for the physical characteristics of their shared resource, while in turn allocating its attributes to the logical resource shares based on their individual market participation. This modeling effort introduces the concept of parent resource modeling, where different logical shares of a single physical parent resource will be dispatched, subject to the physical resource constraints and defined interdependencies between the physical resource and the logical resources.

The lessons learned from the JOU Pilot will inform a future CAISO stakeholder initiative that will consider expanding the joint owned unit modeling functionality to enable other resources and their associated resource shares to participate in the market through an amendment to the CAISO tariff. The JOU Pilot bridges a gap between the

¹ The CAISO submits the Joint Owned Unit Pilot Agreement pursuant to Section 205 of the Federal Power Act, 16 U.S.C. § 824d. The Agreement is included as Attachment A to this filing, and is designated as CAISO service agreement No. 6956.

current shared resource modeling solution and the future joint owned modeling solution, while providing valuable experience regarding the complexities of modeling logical resource shares participating in the market based on physical resource constraints and delivered to separate balancing authority areas. In the meantime, the Agreement supplements the CAISO tariff and the *pro forma* EIM participation agreements to provide for EIM participation by the individual PNM and TEP resource shares and establishes the associated responsibilities of the shared resources included in the JOU Pilot.²

The CAISO requests that the Commission accept the Agreement effective December 22, 2021, 61 days after this filing. This effective date will support timely EIM implementation of TEP and enable the CAISO to commence a future joint owned unit modeling stakeholder process based on the lessons learned from the JOU Pilot effort with PNM and TEP.

I. Background

The CAISO facilitated a dynamic transfer stakeholder process in 2010-2011 that established the rules for pseudo-ties to the CAISO balancing authority area.³ Separately and subsequently, the CAISO developed the EIM rules that went into effect in 2014.⁴ Together these rules support pseudo-tied resources within the EIM area and market participation by the associated generating units.⁵ In addition, the rules support participation by pseudo-ties of shared resources within the EIM area, including resource shares pseudo-tied between EIM entities or pseudo-tied to the CAISO balancing authority area.⁶ However, a generating unit with resource shares pseudo-tied into

² The Commission has previously accepted supplemental rules applicable to a specific resource for purposes of gaining experience prior to initiating a stakeholder process to develop rules generally applicable through a tariff amendment. See, e.g., *Cal. Indep. Sys. Operator Corp.*, 171 FERC ¶ 61,262 (2020) (accepting a split resource participation agreement between the CAISO and the Calpine Sutter Energy Center); see also, *infra*, fn. 18.

³ CAISO Tariff, Appendix N (containing the rules applicable to pseudo-ties to the CAISO balancing authority area); *Cal. Indep. Sys. Operator Corp.*, 136 FERC ¶ 61,239 (2011). More recently, the CAISO amended these rules to permit resource shares to be pseudo-tied to the CAISO balancing authority area. CAISO Tariff, Appendix N, Section 3; see also, *Cal. Indep. Sys. Operator Corp.*, 174 FERC ¶ 61,059 (2021) (accepting the rules applicable to pseudo-ties of shared resources to the CAISO balancing authority area); and *Cal. Indep. Sys. Operator Corp.*, 171 FERC ¶ 61,262 (2020) (accepting a split resource participation agreement between the CAISO and the Calpine Sutter Energy Center).

⁴ CAISO Tariff, Section 29 (establishing the rules applicable to participation in the EIM); see also, *Cal. Indep. Sys. Operator Corp.*, 149 FERC ¶ 61,005 (2014).

⁵ See CAISO Tariff, Appendix A, Generating Unit (defined as including resources pseudo-tied to the CAISO balancing authority area and, for purposes of the real-time market participation only, resources located in an EIM entity balancing authority area).

⁶ Pseudo-tied shared resources are not eligible to be registered in the market as multi-stage generating units. See CAISO Tariff, Appendix N, Section 3.1.2 (exempting a Scheduling Coordinator that

another balancing authority area is not physically represented in the market model—only the individual resource shares are logically modeled in the market. This modeling limitation is a less optimal solution because the individual resource shares are not linked to a physical resource in the market model. Further, the sharing of pseudo-tied resource shares places a burden on the resource share owners to coordinate operation of the shared resource and allocate the output to the individual shares in separate balancing authority areas.⁷

The CAISO has yet to fully develop software capable of physically modeling a resource and concurrently allocating the resource's attributes to logical resource shares participating in the market.⁸ This means that the modeling of shared pseudo-tie resources as separate market resources is limited to simple generators with a non-negative minimum load, start-up and minimum-load costs, and a single operating range.⁹ The Agreement would support market resource participation by individual shares derived from one resource through enhanced modeling.¹⁰ Thus, the JOU Pilot would produce a more optimal market solution and alleviate the burden currently placed

represents a share of a multi-stage generating Resource from registering that share in accordance with Section 27.8, and excusing the CAISO from modeling specific resource characteristic that it otherwise would model if the resource were registered as a multi-stage generating resource, or that represents a forbidden operating region). Similarly, the JOU Pilot resources will not be registered in the market as multi-stage generating units to allow for greater resource sharing flexibility. This modeling capability and the balance between flexibility to support resource sharing arrangements and the inherent modeling limitations, particularly when transitioning through forbidden regions, will likely be considered as part of the future joint owned unit modeling stakeholder initiative based on the learning from the JOU Pilot.

⁷ In the case of resource shares pseudo-tied to the CAISO balancing authority area, this requires developing an allocation protocol and appointing a protocol administrator. See CAISO Tariff, Appendix N, Section 3.2 (requiring an allocation protocol and protocol administrator to manage the shared resource).

⁸ The split resource participation agreement between the CAISO and the Calpine Sutter Energy Center separated a physical resource to independent logical resources not tied to a physical resource in the market. The JOU Pilot models different logical shares of a physical resource that are dispatched subject to the physical constraints of the resource.

⁹ See CAISO Transmittal Letter in Docket No. ER21-447 (explaining the requirements for CAISO market participation as a shared pseudo-tie resource), and *Cal. Indep. Sys. Operator Corp.*, 174 FERC ¶ 61,059 (2021) (accepting the rules applicable to pseudo-ties of shared resources to the CAISO balancing authority area).

¹⁰ The CAISO may consider in the future stakeholder initiative further enhancements to the joint-owned modeling solution that would enable multi-stage generating unit participation, which was first introduced in 2010. See *Cal. Indep. Sys. Operator Corp.*, 132 FERC ¶ 61,087 (2010) (accepting rules to account for the respective costs of a multi-stage resource's various configurations and to account for the multi-stage generator moving between these various configurations). However, this functionality will not be part of this JOU Pilot.

on resource owners by automating the resource allocation function currently performed among the share owners.¹¹

The JOU Pilot involves the Luna Energy Facility located in the PNM balancing authority area (the “Parent Resource”).¹² The Luna Energy Facility is a 570 MW natural gas-fired power plant consisting of a 2×1 combined cycle power block, which is shared equally among PNM, TEP and a third party that will not be participating in the EIM with its share at this time (each a “Child Resource”).¹³

The Child Resources are derived from a Parent Resource and represent different resource sharing arrangements. The Parent Resource will have one Child Resource represented as a pseudo-tie share (TEP’s share) and another Child Resource that will remain in the native balancing authority area (PNM’s share), while the third share will remain in the native balancing authority area but not participate in the market.¹⁴ This combination of sharing arrangements will provide a reasonable set of resources for the JOU Pilot to consider without involving too many participants that might further complicate matters. This will permit the CAISO to evaluate the modeling functionality without unnecessarily increasing the potential adverse impacts of any shortcomings in the model that may be identified during the JOU Pilot. This balanced and limited resource mix will help the CAISO effectively evaluate the results of the JOU Pilot, and it will nonetheless provide a solid foundation to assess the performance of the functionality and consider making joint owned unit modeling functionality more broadly available through a tariff-based mechanism.

¹¹ For pseudo-ties of shared resources to the CAISO balancing authority area, this functionality could fulfill the obligations of the protocol administrator depending on the outcome of the future joint-owned unit modeling stakeholder initiative.

¹² The CAISO will engage with interested and similarly situated entities to discuss their desire to enter into an arrangement similar to the JOU Pilot based on the terms of the Agreement prior to the future joint owned unit modeling stakeholder initiative. Otherwise, the CAISO looks forward to working with all interested stakeholders to consider appropriate changes to the CAISO tariff in support of joint owned resource participation in the market.

¹³ The third-party share will be represented as a non-participating EIM resource share by PNM as the EIM entity for the Parent Resource. See CAISO Tariff section 29.4(c)(4)(C) (obligating the EIM entity scheduling coordinator to register non-participating EIM resources located in its balancing authority area).

¹⁴ EIM non-participating resources are base scheduled by the EIM entity, subject to manual dispatch instructions from the EIM entity, and settled with the CAISO by the EIM entity. CAISO Tariff sections 29.34 and 29.11. Accordingly, only PNM and TEP are parties to the Agreement.

The JOU Pilot will also support TEP's entry into the EIM on April 1, 2022.¹⁵ PNM commenced participation in the EIM this past April,¹⁶ and during the PNM implementation and the ongoing TEP implementation, the parties discussed how to implement the PNM and TEP resource sharing arrangement. Prior to TEP's participation in EIM there is no issue because the TEP balancing authority area is outside the EIM area, and the pseudo-tied TEP share is not accounted for in the market model. Once TEP becomes part of the EIM area, however, its pseudo-tied shares must be accounted for in the market model, and the current CAISO modeling limitation of shared pseudo-tied resource participation is not consistent with the PNM and TEP resource sharing arrangements. This circumstance is not unique to PNM and TEP—other EIM entities share resources by pseudo-tie, and the EIM can only support these resource sharing arrangements under the currently available modeling solution.

The TEP implementation effort represents the earliest opportunity for the CAISO to work towards developing the software required to model both the shared resource and the individual resource shares participating in the market. Identifying and resolving technical issues through the JOU Pilot will assist the CAISO and stakeholders in evaluating this functionality and developing a tariff-based mechanism.¹⁷ In the meantime, acceptance of the Agreement will support TEP's timely EIM implementation and more accurate representation of TEP's resource sharing arrangement with PNM.

II. The Agreement

The Agreement details the contractual terms applicable to the JOU Pilot. Most of the Agreement includes standard terms and conditions associated with participation in the CAISO markets or in support of other services the CAISO provides that have been previously accepted by the Commission.¹⁸ These provisions address the rules of interpretation, term and termination, applicability of the CAISO tariff, costs, dispute

¹⁵ See Letter Order in Docket No. ER20-596 (2020) (accepting the EIM Implementation Agreement between the CAISO and TEP).

¹⁶ See the Western EIM About page for more information on current and planned participation in the EIM at <https://www.westerneim.com/Pages/About/default.aspx>.

¹⁷ The joint owned unit modeling stakeholder initiative is briefly described in the Draft 2022 Policy Initiatives Catalog dated April 29, 2021, at <http://www.caiso.com/InitiativeDocuments/Draft2022PolicyInitiativesCatalog.pdf>.

¹⁸ See, e.g., *Cal. Indep. Sys. Operator Corp*, 171 FERC ¶ 61,262 (2020) (accepting a split resource participation agreement between the CAISO and the Calpine Sutter Energy Center); and *Cal. Indep. Sys. Operator Corp*, 170 FERC ¶ 61,169 (2020) (letter order accepting a nodal pricing model agreement between the CAISO and PacifiCorp). This framework was originally developed by the CAISO when the metered subsystem agreements were negotiated, which have since been updated on several occasions. For example, see Section 3.2 of the MSSA in the CAISO's filing of the Second Amended and Restated City of Riverside Metered Subsystem Agreement among the CAISO and the City of Riverside, which was accepted by Commission letter order issued on February 23, 2012 in Docket No. ER12-740.

resolution, representations and warranties, liability, uncontrollable forces, and miscellaneous terms. The majority of the specific terms and conditions in these provisions are substantially unchanged from other CAISO *pro forma* participation agreements or are substantially similar to provisions in other CAISO agreements previously accepted by the Commission.¹⁹ This discussion will focus on those provisions unique to the Agreement that establish the scope of the JOU Pilot.

An essential purpose of the Agreement is to define the relationship between the JOU Pilot technical requirements, which are provided in Attachment A and described in more detail below, and the existing EIM resource participation requirements included in the *pro forma* service agreements and the CAISO tariff. Because this is a pilot, the CAISO inherently proposes to supplement the CAISO tariff with additional requirements that will result in some differences between how the Child Resources participate in the EIM and how the Parent Resource would otherwise participate in the EIM. These differences are outlined in terms of the JOU Pilot technical requirements in Attachment A. At the same time, there are numerous CAISO tariff requirements that will apply equally to the JOU Pilot, and must also apply to the Child Resources and the Parent Resource. Accordingly, the Agreement includes provisions that incorporate existing CAISO tariff rules and define the relationship between the technical requirements that govern the JOU Pilot, while providing a procedure for resolution in the event of a conflict between a JOU Pilot technical requirement and a CAISO tariff requirement.

The framework starts with a rule of interpretation in Section 1.2, which allows for matters specifically addressed in the Agreement to govern if there is a conflict with a CAISO tariff provision. Next, section 4.1 of the Agreement incorporates the CAISO tariff into the Agreement as other CAISO *pro forma* service agreements do. The Commission has previously accepted this framework, and it has proven workable for supplanting existing CAISO tariff provisions under specific and limited circumstances accepted by the Commission.²⁰ The JOU Pilot presents another such circumstance. Moreover, because the detailed technical requirements included in Attachment A will interact with existing CAISO tariff requirements in new ways, the Agreement goes beyond this broad principle and includes provisions that clarify what happens if there is a conflict between a technical requirement and a CAISO tariff provision, including dispute resolution.²¹

First, any CAISO tariff requirement will apply if it does not conflict with Attachment A. Further, the Agreement provides for the CAISO to evaluate any identified conflict and advise PNM and TEP of its determination accordingly. If PNM or

¹⁹ *Id.*; see also CAISO Tariff, Appendix B.19 (including the *pro forma* EIM Participating Resource Agreement). Note also that section 2.1 of the Agreement requires the supporting EIM participation agreements to be effective, including an EIM Participating Resource Agreement.

²⁰ *Supra*, fn. 18.

²¹ See Section 5.2 of the Agreement.

TEP object, the CAISO interpretation will apply until the parties accept the circumstances, modify Attachment A to resolve the conflict as provided in the Agreement, or pursue other action under the Agreement. This extension of the framework applied in other contexts will help ensure the JOU Pilot is administered consistent with the CAISO tariff and provides the parties options to resolve any identified conflict. This additional process is a reasonable extension of the framework applied in prior circumstances and will help the parties through the implementation and operation of the JOU Pilot.

In addition, Section 3.4 provides that the JOU Pilot technical requirements in Attachment A may be modified by mutual agreement of the Parties. Such a modification must be memorialized in a revision to Attachment A and be authorized by the Parties' designated executives, which will then be binding on the Parties without the need to execute an amendment to the Agreement *provided* the changes constitute implementation details. This will afford the parties some opportunity to adjust the JOU Pilot implementation, resolve potential conflicts among the requirements, ensure feasible outcomes, increase the mutual benefit from the project, or account for unanticipated circumstances without the need for further Commission approval. At the same time, the Agreement provides that any change to a provision of the Agreement other than an implementation detail in Attachment A, *i.e.*, any change that affects the rates, terms and conditions of service, must be filed with and accepted by the Commission as an amendment to the Agreement for the change to be binding on the parties.²² This will allow some flexibility to address circumstances that might arise throughout the JOU Pilot similar to how the CAISO administers implementation details provided in its business practice manuals, while providing the Commission assurance that changes in the rates, terms and conditions of service will only be undertaken with prior authorization from the Commission.

The JOU Pilot will also have a limited duration. Section 2.2 provides that the Agreement will terminate after three years unless amended, which would require Commission acceptance. This term limitation will ensure that the JOU Pilot does not extend beyond the timeframe for the CAISO to conduct a stakeholder process considering the availability of joint-owned unit modeling functionality through an amendment to the CAISO tariff. At the same time, the opportunity to amend the Agreement and justify extension of the JOU Pilot will provide the parties some opportunity to account for unanticipated circumstances.

Together the Agreement's provisions outlined above establish a just and reasonable framework for the implementation and operation of the JOU Pilot. This framework will support the parties' adherence to both the CAISO tariff requirements and the technical requirements included in Attachment A.

²² See Sections 3.4 and 9.8 of the Agreement.

III. Attachment A Technical Requirements

Attachment A to the Agreement provides the JOU Pilot technical requirements. As explained above, these technical requirements supplement the EIM *pro forma* participation agreements and the CAISO tariff.²³ This section outlines the requirement categories and describes areas of similarity and difference with respect to how individual resources would participate under the EIM *pro forma* participation agreements and the CAISO tariff.

The intent of the JOU Pilot is to enable shared resource participation as consistently as possible with the typical resource participation under the EIM *pro forma* agreements and the CAISO tariff. Most of the technical requirements define how the Parent Resource's physical characteristics are passed down to the Child Resources for purposes of EIM participation. Once registered and passed down to the Child Resources, these characteristics are accounted for in the CAISO market much the same as any other individual EIM resource. In other words, there is more similarity regarding EIM participation by the Child Resources than difference under the Agreement. Nonetheless, there are some differences and the requirements to pass down the Parent Resource characteristics are fairly extensive. The following discussion represents a summary of the requirements included in Attachment A of the Agreement.

A. JOU Resource Registration

The Parent Resource and the Child Resources must be represented by a scheduling coordinator, and the resources must be registered consistent with provisions and business processes applicable to the registration of EIM participating and non-participating resources. The Parent Resource must be represented by the EIM entity scheduling coordinator for the balancing authority area in which it is *physically* located under a separate scheduling coordinator identification. The CAISO requires this unique scheduling coordinator identification in the JOU Pilot to ensure that the Parent Resource is not settled, and therefore this scheduling coordinator identification will not be assessed an administrative fee as part of the JOU Pilot.²⁴ Additional scheduling coordinator identifications are generally requested by the entity, not required by the CAISO. Further, since the Parent Resource will not be settled, it would be inappropriate to charge an administrative fee for this unique scheduling coordinator identification.

Each Child Resource may be represented by a different scheduling coordinator and registered as either an EIM participating resource or an EIM non-participating

²³ See CAISO Tariff, Appendix B.17–B.20 (collectively the *pro forma* EIM participation agreements).

²⁴ See, e.g., CAISO Tariff, Section 11.22.8 (establishing a scheduling coordinator identification charge of \$1,500 per month). It is uncertain that a unique scheduling coordinator identification would be required beyond the JOU Pilot, and the CAISO will consider questions such as this and others in the future JOU stakeholder initiative.

resource.²⁵ Child Resources may be located in different balancing authority areas from the Parent Resource if established as a pseudo-tie.²⁶ The Parent Resource scheduling coordinator will register the mapping between Child Resources and the Parent Resource, including the percentage share associated with each Child Resource. These shares can only be established as static values, and the sum of all Child Resource shares linked to a single Parent Resource must equal 100 percent.

Parent Resources will only be modeled as non-multistage generators, *i.e.*, resources with characteristics that would otherwise require registration as a multi-stage generator but are not registered as such.²⁷ A Child Resource registration and logical model type also must correspond to the registration and model type of the Parent Resource.

There are requirements concerning the registration of minimum load and regulation limits for Child Resources.²⁸ In essence, these rules are designed to ensure that the sum of the individual values of the Child Resources will not exceed the individual value of the Parent Resource. Further, the individual maximum output of the upper limit of the Parent Resource must equal the sum of the individual values of the associated Child Resources. Together these requirements establish the book end operating limits of the Child Resources based on the Parent Resource's physical operating characteristics, while allowing Child Resources to share the resource characteristics between the book end operating limits consistent with their resource sharing arrangements.

Similarly, there are requirements concerning the registration of parameters for the Parent Resource and the corresponding parameters for the Child Resources.²⁹ The

²⁵ If the Child Resource is registered as an EIM non-participating resource, it must be represented by the EIM entity for the balancing authority area it is located, which is also consistent with existing requirements for EIM non-participating resources.

²⁶ A Child Resource registered as an EIM non-participating resource must be represented by the EIM entity of the balancing authority area in which it is located. If the Child Resource is registered as an EIM participating resource it may be represented by any certified EIM participating resource scheduling coordinator. There are also a number of rules about the mapping of the associated pricing nodes to align with the resource locations so that they remain appropriately connected with the parent resource regardless of location.

²⁷ The CAISO anticipates discussing the application of this joint-owned unit modeling functionality to multi-stage generators as part of the future joint owned unit modeling stakeholder initiative.

²⁸ See CAISO Tariff, Section 29.34(e) and 29.34(r) (establishing the submission procedures for upward and downward available balancing capacity, which are modeled similar to upward and downward regulation limits).

²⁹ See Attachment A of the Agreement, sections 1.10 and 1.13 (providing separate tables identifying the master file parameters that may be registered independently by the Child Resources and the master file parameters that must be registered by the Parent Resource). In the case of the PNM and TEP, the Child Resources may have different fuel regions and it is important that this parameter be eligible for

Child Resource scheduling coordinator must structure the registration in a manner that provides ease of reference to the associated Parent Resource while, at the same time, providing flexibility to register certain parameters independently of the corresponding parameters associated with the Parent Resource. The CAISO will provide the entire list of registered parameters to the parties as part of the JOU Pilot implementation and to the Department of Market Monitoring to the extent it does not already have the information as a result of the resource registration process.

This resource registration process will ensure that the CAISO systems accurately recognize and account for the resource characteristics of the Parent Resource and the Child Resources in the JOU Pilot. Similarly, the scheduling coordinators for the Parent Resource and Child Resources will be able to reflect their resource sharing arrangements within the context of the requirements established by the Agreement.

B. Calculated Costs for JOU Resources

The Parent Resource and the Child Resources will follow certain calculated cost allocation procedures. For purposes of the JOU Pilot, the default energy bid (“DEB”) will be calculated at the Child Resource level following the negotiated DEB process as its only rank option.³⁰ Each Child Resource scheduling coordinator will be responsible for establishing the negotiated DEB for its resource. The energy price index calculated for the Parent Resource will be applied to the Child Resources. The major maintenance adder component of the minimum load cost and start-up cost for the Parent Resource will be applied to its Child Resources using a pro-rata allocation based on the percentage share associated with each Child Resource. The Parent Resource scheduling coordinator will be responsible for applying for the negotiated major maintenance adder. The Child Resource will receive the same greenhouse gas maximum compliance cost calculated for the Parent Resource. Limiting the DEB rank options to the negotiated option for the Child Resources based on the corresponding characteristics of the Parent Resource will simplify the DEB process for purposes of the JOU Pilot, while providing a framework to establish a just and reasonable DEB in accordance with existing CAISO tariff procedures.

independent registration by each Child Resource for reference in the default energy bid negotiation process.

³⁰ See CAISO Tariff, Section 39.7.1.3 (establishing the process to negotiate a DEB). Expanding the DEB rank options available to joint owned unit modeling participation will in all likelihood be considered in the future stakeholder initiative. In any event, Child Resources will have the local market power mitigation flag enabled automatically if their Parent Resource is enabled, and the dynamic competitive path assessment process will mitigate the Child Resource to its DEB as appropriate.

C. Market Participation by JOU Resources

Child Resources may be registered as EIM participating resources or non-participating resources, and will participate and be accounted for as other EIM resources except as discussed below. The Parent Resource cannot participate in the market in any way that would result in settlement, but its characteristics will be accounted for in the market as discussed below.

1. Bidding by JOU Resources

Child Resources participating in the market will submit real-time bids with the option to submit different bids for energy and flexibility. The Parent Resource will not be allowed to submit energy bids or view any bid segments it has not submitted. Bid parameters for start-up and ramp rate submitted for the Parent Resource will be applied to its Child Resources. The default start-up and minimum load costs calculated for the Parent Resource will be applied to the Child Resource in a pro-rata manner using the percentage share associated with each Child Resource. Similarly, the reasonableness threshold for start-up and minimum load costs calculated for the Parent Resource will be applied to the Child Resource in a pro-rata manner using the percentage share of the individual Child Resource.

The Child Resource scheduling coordinator may submit revised values of the default start-up and minimum load costs, and will have the sole right to access and view the submittals. An inactive Child Resource does not have any base schedule or bids in the EIM for a given market interval, while an active Child Resource does. The default minimum load costs of inactive Child Resources will be re-allocated to the minimum load costs of active Child Resources such that the total percentage shares of the active Child Resources add up to a 100% while maintaining the ratio of their original percentage shares. The default start-up costs of inactive Child Resources will be re-allocated to the start-up costs of active Child Resources such that the total percentage shares of the active Child Resources add up to a 100% while maintaining the ratio of their original percentage shares. This approach increases the flexibility for the model to account for resource sharing arrangements.

The Child Resource scheduling coordinator will have the sole right to submit and view the base schedules for the Child Resource. If the base schedules of the Child Resources associated with the Parent Resource, in aggregate, is equal to or higher than the minimum load of the Parent Resource, the expected energy of the Child Resources will be calculated in accordance with the CAISO tariff.³¹ If the base schedules of the Child Resources associated with the Parent Resource, in aggregate, is lower than the minimum load of the Parent Resource, the allocation methodology

³¹ See CAISO Tariff, Section 29.11(b) (providing for settlement of imbalance energy); and CAISO Tariff, Section 29.34(f) (establishing the EIM base schedule submission procedures).

outlined at the end of section 2 below shall apply. Again, this approach increases the flexibility for the model to account for resource sharing arrangements.

These bidding and cost allocation rules enable the Parent Resource parameters to be registered, validated and constrain participation as appropriate of the Child Resources. It is necessary to include these constraints and the others explained further below in the model so that the characteristics of the Parent Resource are enforced in the market with respect to EIM participation by the Child Resources. Enforcing these constraints is a new modeling concept that will be evaluated as part of the JOU Pilot, and the CAISO will gather information about the performance of these modeling constraints to inform the parties and ultimately a CAISO stakeholder initiative.³²

2. Schedules of JOU Resources

The submitted base schedules on the Child Resources will be deemed valid even if the aggregate of the base schedules is lower than the minimum load of the Parent Resource. The submittal and the validation of such base schedules will result in the Parent Resource being deemed to be in start-up subject to existing additional conditions. While the Parent Resource is in start-up, no bids for the Child Resources will be utilized or published as part of the final bid set, and only zero MW dispatch operating targets for the Child Resources will be created until the Parent Resource completes its start-up.

When a Parent Resource has a minimum load re-rate, the cost of its participating and non-participating Child Resources will be adjusted in accordance with the CAISO tariff,³³ considering any intermediate parameters created for each Child Resource. Any such adjustment will have priority over any re-allocation of the default minimum load cost of a non-participating Child Resource to the default minimum load cost of participating Child Resources of the same Parent Resource. The minimum load and start-up cost of the Parent Resource will be the sum of all its active Child Resources following the methodology above. This maintains primacy of the Parent Resource commitment cost allocations.

The Child Resources will be constrained to the same commitment status as the Parent Resource. There will be no commitment costs modeled for a Parent Resource during its self-commitment period due to one or more of its Child Resources being subject to a self-commitment period. When one Child Resource submits a self-schedule or a base schedule, all participating Child Resources belonging to the Parent Resource will be entered into a self-commitment period with self-schedules or base

³² See Section 3.5 of the Agreement (providing a forum for the parties to review progress of the JOU Pilot and make adjustments as may be required and permitted by the Agreement).

³³ See CAISO Tariff, Sections 11.8.3 and 11.8.4 (accounting for minimum load costs in the real-time market processes).

schedules to at least their minimum load. The Parent Resource will also be entered into a self-commitment period, and will be constrained by certain physical constraints, while the Child Resource schedules will be constrained during their commitment periods by power balance, capacity, scheduling, and economic limits. This maintains alignment of the commitment status between the Parent Resource and Child Resources when schedule changes occur.

With respect to bid cost recovery,³⁴ the CAISO acknowledges that allowing each Child Resource to independently register a 1 MW minimum load could under certain conditions allow a child resource to receive bid cost recovery that would otherwise not be available.³⁵ For example, if a Child Resource with an economic bid above 1 MW is dispatched to accommodate the Parent Resource's minimum load, the Child Resource's economic bid would have its minimum load energy converted to energy under a bid, called optimal energy, and this energy would be eligible for bid cost recovery. Bid cost recovery is intended to compensate for uneconomic dispatch because of inter-temporal constraints; however, in this case, the uneconomic dispatch would be forced by the 1 MW minimum load allowance in the JOU Pilot. It is therefore possible for a Child Resource to submit an energy bid which could be dispatched uneconomically to accommodate the Parent Resource's minimum load, thereby qualifying for bid cost recovery when such recovery would otherwise not be available.

We believe the conditions that might give rise to this circumstance are unlikely to occur in practice and that the most likely allocation of the resulting costs would be a disincentive, but the conditions for this to occur are possible under the JOU Pilot scheduling rules and will need to be monitored. In practice, it is expected that the sum of all Child Resource bids or base schedules will be equal or greater than the minimum load of the Parent Resource, or that all schedules will be base-scheduled and ineligible for bid cost recovery. The CAISO will provide the sum of all Child Resource schedules to the Parent Resource scheduling coordinator so that the information to manage this circumstance would be available when determining appropriate schedules, and would consider any identified occurrence of this uneconomic circumstance as potentially inappropriate bidding behavior under the rules of conduct.³⁶

The 1 MW minimum load approach was undertaken for the JOU Pilot with an understanding of this circumstance to allow for greater flexibility of child resource sharing arrangements. Other options, such as restricting the Child Resources to a *pro*

³⁴ See *generally* CAISO Tariff, Section 11.8 (providing for bid cost recovery for resources with economic bids and excluding bid cost recovery for self-committed resources, i.e., base scheduled resources in the EIM as included by CAISO Tariff section 29.11).

³⁵ See Attachment A of the Agreement, section 1.11 (providing the minimum load registration requirements for the Parent Resource and Child Resources).

³⁶ See *generally* CAISO Tariff, Section 37 (providing for the rules of conduct as incorporated into the EIM by CAISO Tariff section 29.37).

rata share of the Parent Resource's minimum load or enforcing a rule to exclude any bid below the minimum load of the Parent Resource from bid cost recovery were considered by the CAISO, but they were either deemed problematic to implement in the CAISO systems on a pilot basis or they inappropriately restricted the resource sharing arrangement of the participants. The CAISO believes that for the JOU Pilot it is reasonable to balance the potential for bid cost recovery under this circumstance with the desired scheduling flexibility of the parties as provided in the Agreement. The CAISO will monitor for circumstances that may provide for bid cost recovery that otherwise would not be available, and will gather information that will inform the future stakeholder initiative with respect to the performance of the Child Resource's 1 MW minimum load allowance. This information will in turn allow the CAISO to further consider the most appropriate joint owned modeling approach with all interested stakeholders.

Schedules and instructions applicable to Child Resources will also be utilized to construct appropriate schedules and instructions for the Parent Resource. For the Parent Resource, an energy schedule will be derived as the sum of the energy schedules of all of its Child Resources. There will be no calculation of expected energy, expected energy allocation, or commodity allocation for the Parent Resource. If the base schedules of the Child Resources associated with the Parent Resource, in aggregate, is lower than the minimum load of the Parent Resource, the expected energy of the Child Resources will be calculated in accordance with the following methodology:

- If all the dispatch operating targets of the Child Resources are zero, the Parent Resource will be considered to be in start-up, and the expected energy for all the Child Resources will be calculated in accordance with EIM base schedule submission deadline rules.³⁷
- If any of the dispatch operating targets of the Child Resources are non-zero (and greater than 0.01 MW), the Parent Resource is considered to be in commitment status type "On", and expected energy for all the Child Resources will be calculated in accordance with the CAISO tariff.³⁸

Together these rules translate submissions and resource status between the Parent Resource and Child Resources, and vice versa. This allows the model to automatically reflect the appropriate status of the Child Resources in the market depending upon the actions taken, or limitation enforced, at the Parent Resource and

³⁷ *Supra*, fn. 31.

³⁸ See CAISO Tariff Section 29.11(b) (providing for real-time market settlement of instructed imbalance energy, including expected energy), and CAISO Tariff, Appendix A (defining "Expected Energy" as the total Energy that is expected to be generated or consumed by a resource based on the dispatch of that resource).

Child Resource levels. The performance of these constraints will be a focus of the JOU Pilot and the results will be a key ingredient in considering extension of joint-owned modeling functionality through a future stakeholder initiative.

3. EIM Manual Dispatch of JOU Resources

There may be restrictions imposed on EIM manual dispatch instructions for the startup or shutdown of the Parent Resource when they are submitted by the EIM entity for the balancing authority area where the Parent Resource is located. In this case, the EIM entity will have the sole right to submit such instructions that will be communicated to the Parent Resource scheduling coordinator. All manual dispatch instructions on a Parent Resource will be applicable to its Child Resources. All manual dispatch instructions submitted for Child Resources will be aggregated and applied to its Parent Resource, if the manual dispatches are of the same type and can be aggregated. If the manual dispatch for a Parent Resource or a Child Resource conflicts with previous instructions, the CAISO will provide notification so that the EIM entities may resolve such conflict.

When a Parent Resource is subject to manual dispatch start-up, the CAISO will create instructions for its Child Resources to dispatch them to the appropriate MW value in support of the Parent Resource's commitment period. These instructions will dispatch the active Child Resources to minimum load if the sum of the individual minimum loads of the Child Resources equal the minimum load of the Parent Resource; otherwise, the active Child Resources will be dispatched to the appropriate MW level to ensure that the sum of their individual dispatched MW levels equal the minimum load of the Parent Resource.

4. Ramp Rates of JOU Resources

Both the Parent Resource and Child Resource scheduling coordinators will be allowed to submit ramp rates for their individual resources for registration in master file. Child Resources will be limited to a single segment ramp rate, and the sum of all such Child Resource ramp rates must not exceed the maximum ramp rate segment of the Parent Resource. A scaling factor calculated using the ratio of the highest derated ramp rate segment and the registered ramp rate segment of the Parent Resource will be used to re-calculate the ramp rates of the Child Resources.

D. Outage Management for JOU Resources

In general, outages will be submitted in accordance with the procedures and timelines provided in CAISO tariff.³⁹ The Child Resource scheduling coordinator will not be allowed to submit certain types of outages that must be submitted on the Parent Resource. Instead, such outages will be translated to the Child Resource. Overlapping

³⁹ See CAISO Tariff, Section 29.9 (providing the outage management process for EIM resources).

outages between the Parent Resource and its Child Resources will also be treated in accordance with the CAISO tariff outage management provisions. If an outage on the entire Parent Resource is applied to its Child Resources, the Child Resource scheduling coordinator will be allowed to view, but not edit, the translated outage data on its Child Resource.

The Parent Resource scheduling coordinator will be allowed to submit and view outages solely for the Parent Resource, and may view outages applicable to its Child Resources only if authorized by the applicable Child Resource scheduling coordinator. The Child Resource scheduling coordinator will be allowed to submit and view outages solely for the Child Resource it represents, and will not be allowed to view outages on the Parent Resource or other associated Child Resources. These limitations will facilitate participation while ensuring appropriate limits on access to outage information.

E. Metering for JOU Resources

The Parent Resource scheduling coordinator will ensure that revenue grade meters are utilized for the purposes of submitting physical meter data to the CAISO for the Parent Resource at the same level of granularity as the Child Resources. The CAISO will use meter data submitted for the Parent Resource in the commitment cost qualification process but will not use the meter data for settlement of any CAISO charges.

The Child Resource scheduling coordinator will submit meter data in accordance with the particular Child Resource's settlement quality meter data plan. For the purposes of the settlement quality meter data plan, the Child Resource scheduling coordinator will ensure metering devices are established at the respective inter-ties where the energy from the Child Resource is measured.

Meter data submitted for the Parent Resource will be compared against its Child Resources, and the meter data for both types of resources will fail validation if their difference is outside of the specified tolerance. This specified tolerance accounts for numerical rounding errors caused by the utilization of Parent Resource meter data for purposes of logically calculating Child Resource meter data. The meter data for the Child Resources that fail validation will still be used for settlement without any modification by CAISO. A daily report, detailing the meter data intervals that failed validation and associated supporting information, will be generated and provided to the applicable Parent Resource and Child Resource scheduling coordinators. The scheduling coordinators are responsible for correcting and re-submitting the meter data

intervals that failed validation, and failure to do so will be addressed in accordance with CAISO tariff meter data submission requirements.⁴⁰

F. Settlements for JOU Resources

Child Resources will be subject to settlement in accordance with the CAISO tariff provisions applicable to EIM participating resources and EIM non-participating resources, as applicable.⁴¹ The Parent Resource will not be subject to any settlement.

Commitment cost qualification calculations will be performed for the Parent Resource as part of the bid cost recovery process by comparing the meter data and effective minimum load (accounting for any re-rates) of the Parent Resource. All Child Resources will receive the outcome of this commitment cost qualification process.

For the persistent deviation metric and real-time performance metric used in settlement, the ramp rate for Child Resources will be calculated by dividing the delta of the dispatch operating targets from consecutive settlement intervals by the time difference between those intervals. This calculation will also apply to self-commitment periods for Child Resources.

IV. Next Steps

Following Commission acceptance of the Agreement, the CAISO will continue its work with PNM and TEP to register the Parent Resource and Child Resources according to the Agreement and complete any remaining modeling and testing in parallel with the implementation of TEP into the EIM on April 1, 2022. This will include registration and preparation of the supporting systems and procedures for operation of the JOU Pilot.

V. Contents of this Filing

In addition to this transmittal letter, this filing includes the following attachment:

Attachment A Executed Agreement

VI. Effective Date

The CAISO respectfully requests that the Commissions accept the Agreement effective on December 22, 2021, sixty one days after the date of this filing. This requested effective date will support the ongoing EIM market simulation and planned parallel operation for TEP and the associated readiness certification required for TEP's

⁴⁰ See CAISO Tariff, Section 29.37 (applying the rules of conduct to EIM participation, including the meter data penalties in section 37.5.2).

⁴¹ See CAISO Tariff, Section 29.11 (establishing settlement rules for EIM resources).

implementation into the EIM on April 1, 2022. Production operation of the JOU Pilot will commence on the TEP implementation date. Testing and accounting for the Parent Resource and Child Resources according to the Agreement is an integral part of the TEP'S EIM readiness effort, and will also provide PNM assurance that the operation of these resources will align with the ownership sharing arrangements upon the implementation of TEP into the EIM. Accordingly, the CAISO requests that the Agreement be made effective on December 22, 2021.

VII. Service

The CAISO has served copies of this filing upon all scheduling coordinators, PNM, TEP, the California Public Utilities Commission, and the California Energy Commission. In addition, the CAISO has posted the filing on the CAISO website.

VIII. Correspondence

Pursuant to Rule 203(b)(3) of the Commission's Rules of Practice and Procedure,⁴² the CAISO requests that all correspondence, pleadings, and other communications concerning this filing be served upon the following:

John C. Anders
Assistant General Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7287
E-mail: janders@caiso.com

⁴² 18 C.F.R. § 385.203(b)(3).

IX. Conclusion

The CAISO respectfully requests that the Commission accept this filing and permit the Agreement to be effective December 22, 2021, as requested. If there are any questions concerning this filing, please contact the undersigned.

Respectfully submitted,

By: /s/ John C. Anders

Roger E. Collanton

General Counsel

Burton A. Gross

Deputy General Counsel

John C. Anders

Assistant General Counsel

California Independent System

Operator Corporation

Tel: (916) 608-7287

Email: janders@caiso.com

*Attorneys for the California Independent
System Operator Corporation*

Attachment A – Executed Agreement
Joint Owned Unit Pilot Agreement – TEP & PNM
California Independent System Operator Corporation
October 22, 2021

X

**CALIFORNIA INDEPENDENT SYSTEM
OPERATOR CORPORATION**

**PUBLIC SERVICE COMPANY OF
NEW MEXICO**

AND

TUCSON ELECTRIC POWER

**JOINT OWNED UNIT
PILOT AGREEMENT**

JOINT OWNED UNIT PILOT AGREEMENT

THIS JOINT OWNED UNIT PILOT AGREEMENT (“AGREEMENT”) is established this 21st day of October, 2021, and is accepted by and among:

- (1) **Public Service Company of New Mexico (“PNM”)**, a New Mexico corporation having its registered and principal executive office at 414 Silver Avenue, SW, MS 1105, Albuquerque, NM 87102-3289,
- (2) **Tucson Electric Power (“TEP”)**, an Arizona corporation having its registered and principal executive office at 88 East Broadway Blvd., Tucson, AZ 85701,

and

- (3) **California Independent System Operator Corporation (“CAISO”)**, a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate.

PNM, TEP and the CAISO are hereinafter referred to as the “Parties.”

Whereas:

- A. PNM joined the Energy Imbalance Market on April 1, 2021 and TEP is expected to join the EIM on April 1, 2022.
- B. PNM hosts the Luna Energy Facility within its Balancing Authority Area and dynamically transfers some portions of the associated Generating Units to the TEP Balancing Authority Area.
- C. The CAISO supports dynamic transfers in the EIM, including the opportunity for shared Pseudo-Ties from a Generating Unit in an EIM Entity Balancing Authority Area to be dynamically transferred into the CAISO Balancing Authority Area, and is interested in piloting its recently developed joint owned unit modeling functionality (“JOU Model”) prior to considering CAISO Tariff changes to extend the functionality to all eligible CAISO Market Participants.
- D. PNM and TEP would benefit from having this functionality available when TEP joins the EIM so that shares of Pseudo-Tied resources dynamically transferred from the PNM Balancing Authority Area to the TEP Balancing Authority Area are more accurately modeled in the EIM, and both are willing to participate in a JOU Model pilot together with the CAISO (“JOU Pilot”).

- E. Only the PNM shares and the shares of Pseudo-Tied resources dynamically transferred from the PNM Balancing Authority Area to the TEP Balancing Authority Area will be specifically included in the JOU Pilot.
- F. The Parties are entering into this Agreement to provide for the scope of work to implement the JOU Model and to support the ongoing JOU Pilot.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, **THE PARTIES AGREE** as follows:

ARTICLE I DEFINITIONS AND INTERPRETATION

- 1.1 Master Definitions Supplement.** All capitalized terms and expressions used and not otherwise defined in this Agreement shall have the same meaning as those contained in the Master Definitions Supplement to the CAISO Tariff.
- 1.2 Rules of Interpretation.** The following rules of interpretation and conventions shall apply to this Agreement:
 - (a) if and to the extent a matter is specifically addressed by a provision of this Agreement, the provision of this Agreement shall govern notwithstanding any inconsistent provisions of the CAISO Tariff;
 - (b) if and to the extent this Agreement provides that a matter shall be determined in accordance with the applicable provisions of the CAISO Tariff, the applicable provisions of the CAISO Tariff shall govern;
 - (c) the singular shall include the plural and vice versa;
 - (d) the masculine shall include the feminine and neutral and vice versa;
 - (e) “includes” or “including” shall mean “including without limitation”;
 - (f) references to a Section, Article or Schedule shall mean a Section, Article or a Schedule of this Agreement, as the case may be, unless the context otherwise requires;
 - (g) a reference to a given agreement or instrument shall be a reference to that agreement or instrument as modified, amended, supplemented or restated through the date as of which such reference is made;
 - (h) unless the context otherwise requires, references to any law shall be deemed references to such law as it may be amended, replaced or restated from time to time;

- (i) unless the context otherwise requires, any reference to a “person” includes any individual, partnership, firm, company, corporation, joint venture, trust, association, organization or other entity, in each case whether or not having separate legal personality;
- (j) unless the context otherwise requires, any reference to a Party includes a reference to its permitted successors and assigns;
- (k) any reference to a day, week, month or year is to a calendar day, week, month or year;
- (l) unless the context requires otherwise, “or” is used in the conjunctive sense; and
- (m) the captions and headings in this Agreement are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Agreement.

ARTICLE II TERM AND TERMINATION

2.1 Effective Date. This Agreement shall become effective upon the TEP Implementation Date or such other date as the Agreement may be accepted, approved or otherwise permitted to take effect by FERC, without condition or modification unsatisfactory to any Party (“Effective Date”), and shall remain in full force and effect until terminated pursuant to Section 2.2 of this Agreement. The Parties understand and acknowledge that the *pro forma* CAISO Energy Imbalance Market service agreements must be effective and include the resource information necessary to support the JOU Pilot.

2.1.1 Modification by FERC. In the event FERC requires any modification to the Agreement or imposes any other condition upon its acceptance or approval of the Agreement, each Party shall have ten (10) days to notify the other Parties that any such modification or condition is unacceptable to that Party. If no Party provides such notice, then the Agreement, as modified or conditioned by FERC, shall take effect as of the date determined under section 2.1. If any Party provides such notice to the other Parties, the Parties shall take any one or more of the following actions: (i) meet and confer and agree to accept any modifications or conditions imposed by such FERC order; (ii) jointly seek further administrative or legal remedies with respect to such FERC order, including a request for rehearing or clarification; or (iii) enter into negotiations with respect to accommodation of such FERC order, provided however, if the Parties have not agreed to such an accommodation within thirty (30) days after the date on which such FERC order becomes a final and non-appealable

order, such order shall be deemed an adverse order and the Parties shall have no further rights and obligations under this Agreement.

2.2 Termination. The Parties may mutually agree to terminate this Agreement in writing at any time with six (6) months' notice, and this Agreement will automatically terminate three years after the Effective Date unless amended by the Parties. In addition, the CAISO may terminate this Agreement in accordance with Section 2.2.1 and PNM or TEP may terminate this Agreement in accordance with Section 2.2.2. The Parties acknowledge that in any case the CAISO is required to file a timely notice of termination with FERC, and that this Agreement will terminate upon acceptance by FERC of such a notice of termination in accordance with FERC requirements. In the event this Agreement is terminated, this Agreement will become wholly void and of no further force and effect, and the liabilities and obligations of the Parties hereunder will terminate, and each Party shall be fully released and discharged from any liability or obligation under this Agreement unless survival is otherwise provided.

2.2.1 Termination by CAISO. The CAISO may terminate this Agreement by giving written notice of termination pursuant to the CAISO Tariff six (6) months prior to the termination in the event that: (1) PNM or TEP materially default under this Agreement provided that, if capable of being remedied, the default is not remedied within thirty (30) days after the CAISO has given written notice of the default; (2) the Parties are unable to reach agreement on a change to Attachment A as provided in Section 3.4 or 5.2; or (3) the CAISO reasonably determines prior to the start of JOU Pilot that the JOU Model will adversely impact the EIM.

2.2.2 Termination by PNM or TEP. In the event that PNM or TEP no longer wishes to pursue the JOU Pilot with the CAISO, it must first notify the CAISO in writing of its intent to terminate ("Notice of Intent to Terminate") and engage in thirty (30) days of good faith negotiations in an effort to resolve its concerns. If the Parties successfully resolve the concerns, PNM or TEP as applicable must notify the CAISO in writing of the withdrawal of such notice ("Notice of Resolution"). Otherwise, PNM or TEP as applicable may terminate this Agreement in its sole discretion and for any reason by providing written notice to the CAISO that it is terminating this Agreement six (6) months in advance of the termination ("Termination Notice"). A Termination Notice from either PNM or TEP will terminate this Agreement.

2.3 No Termination Charge. The CAISO shall not levy an exit fee or other charge associated with CAISO systems, procedures, or other changes that may be required by the termination of this Agreement by either Party.

ARTICLE III SCOPE OF WORK AND SERVICES

- 3.1 Scope of Implementation Work.** The Parties will complete the work necessary to implement the JOU Model as described in Attachment A.
- 3.2 Scope of Services.** The Parties will perform the tasks necessary to engage in the JOU Pilot as described in Attachment A.
- 3.3 Charges.** The Parties will each be separately responsible for any and all costs associated with implementation of the JOU Model or participation in the JOU Pilot, provided the CAISO will settle all applicable EIM related charges during the JOU Pilot in accordance with the CAISO Tariff.
- 3.4 Changes to Attachment A.** Either Party may propose a change in Attachment A to the other Party. If a Party proposes a change in Attachment A, the Parties shall negotiate in good faith to attempt to reach agreement on the proposal, any necessary changes in Attachment A and any other affected provision of this Agreement. The agreement of the Parties to a change in Attachment A must be memorialized in a revision to Attachment A and authorized by the Parties' designated executives in Attachment B, which will then be binding on the Parties without the need for execution of an amendment to this Agreement provided the changes constitute implementation details. For purposes of this Agreement, "designated executive" shall mean the individual identified in Attachment B, or their designee or successor. Changes to any provision of this Agreement other than implementation details in Attachment A must be reflected in an executed amendment to this Agreement, and be accepted by FERC to be binding on the Parties. Any change to Attachment A that affects the rates, terms and conditions of service, must be filed with FERC as an amendment

3.5 Review Meetings

The Parties will confer and agree on the framework for conducting periodic meetings to review and discuss the progress of the JOU Pilot. Issues and concerns identified at these meetings by any Party may be resolved in accordance with Sections 3.4, 5.1, and 5.2, as applicable.

ARTICLE IV GENERAL PROVISIONS

- 4.1 Agreement Subject to CAISO Tariff.** Except as provided in Section 1.2(a), this Agreement shall be subject to the CAISO Tariff, which shall be deemed to be incorporated herein.

- 4.2 No Other Relationships.** Nothing contained in this Agreement shall be construed as creating a corporation, company, partnership, association, joint venture or other entity, nor shall anything contained in this Agreement be construed as creating or requiring any fiduciary relationship between the Parties. No Party shall be responsible hereunder for the acts or omissions of the other Parties. This Agreement is for the sole and exclusive benefit of the Parties and shall not create a contractual relationship with, or cause of action in favor of, any third party.

ARTICLE V DISPUTE RESOLUTION

- 5.1 Dispute Resolution.** The Parties shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. In the event any dispute is not settled, the Parties shall adhere to the CAISO ADR Procedures set forth in Section 13 of the CAISO Tariff, which is incorporated by reference, except that any reference in Section 13 of the CAISO Tariff to Market Participants shall be read as a reference to PNM or TEP and references to the CAISO Tariff shall be read as references to this Agreement.
- 5.2 Attachment A Conflict.** In the event any CAISO Tariff requirement or other rule or procedure conflicts with Attachment A as incorporated by Section 4.1, the more specific detail in Attachment A shall govern provided that the CAISO Tariff requirement or other rule or procedure shall apply to the extent it is not in conflict with the requirement in Attachment A. The CAISO will evaluate any identified conflict between Attachment A and a CAISO Tariff requirement or other rule or procedure and advise PNM and TEP of its determination concerning the conflict. If PNM or TEP object to the CAISO determination, the CAISO determination will nonetheless apply until the Parties accept the circumstances consistent with the CAISO determination, modify Attachment A in accordance with Section 9.8 to resolve the conflict, or pursue other action under the Agreement.

ARTICLE VI REPRESENTATIONS AND WARRANTIES

- 6.1 Representation and Warranties.** Each Party represents and warrants that the execution, delivery and performance of this Agreement by it has been duly authorized by all necessary corporate or governmental actions, to the extent authorized by law.
- 6.2 Necessary Approvals.** PNM and TEP each represent that all necessary rights, leases, approvals, permits, licenses, easements, access to operate in compliance with this Agreement have been or will be obtained prior to the effective date of this Agreement, including any arrangement with third parties.

ARTICLE VII LIABILITY

- 7.1 Liability.** The provisions of Section 14 of the CAISO Tariff will apply to liability arising under this Agreement, except that all references in Section 14 of the CAISO Tariff to Market Participants shall be read as references to PNM or TEP and references to the CAISO Tariff shall be read as references to this Agreement.

ARTICLE XIII UNCONTROLLABLE FORCES

- 8.1 Uncontrollable Forces Tariff Provisions.** Section 14.1 of the CAISO Tariff shall be incorporated by reference into this Agreement except that all references in Section 14.1 of the CAISO Tariff to Market Participants shall be read as a reference to PNM or TEP and references to the CAISO Tariff shall be read as references to this Agreement.

ARTICLE IX MISCELLANEOUS

- 9.1 Assignments.** PNM or TEP may assign or transfer any or all of its rights or obligations under this Agreement with the CAISO's prior written consent in accordance with Section 22.2 of the CAISO Tariff, and neither PNM nor TEP may assign or transfer any or all of its rights or obligations under this Agreement without such consent. Such consent shall not be unreasonably withheld. Any such transfer or assignment shall be conditioned upon the successor in interest accepting the rights or obligations under this Agreement as if said successor in interest were an original Party to this Agreement and the successor in interest negotiating an amendment or revision to this Agreement as may be required to facilitate the transfer or assignment. Any such assignment shall also take into consideration the timeline for providing adequate access and training to the CAISO systems to the assignee for continued implementation and operation of the JOU Model and JOU Pilot.
- 9.2 Notices.** Any notice, demand or request which may be given to or made upon any Party regarding this Agreement shall be made in accordance with Section 22.4 of the CAISO Tariff, provided that all references in Section 22.4 of the CAISO Tariff to Market Participants shall be read as a reference to PNM or TEP and references to the CAISO Tariff shall be read as references to this Agreement, and unless otherwise stated or agreed shall be made to the contact for notices representative of the other Parties indicated in Attachment

B. A Party must update the information in Attachment B of this Agreement as information changes. Such changes shall not constitute an amendment to this Agreement.

- 9.3 Waivers.** Any waiver at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations, in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.
- 9.4 Governing Law and Forum.** This Agreement shall be deemed to be a contract made under, and for all purposes shall be governed by and construed in accordance with, the laws of the State of California, except its conflict of law provisions. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement to which the CAISO ADR Procedures do not apply shall be brought in any of the following forums, as appropriate: any court of the State of California, any federal court of the United States of America located in the State of California, or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission. To the fullest extent permitted by law, each of the Parties hereto waives any right it may have to a trial by jury in respect of litigation directly or indirectly arising out of, under or in connection with this Agreement. Each Party further waives any right to consolidate, or to request the consolidation of, any action in which a jury trial has been waived with any other action in which a jury trial cannot be or has not been waived.
- 9.5 Consistency with Federal Laws and Regulations.** This Agreement shall incorporate by reference Section 22.9 of the CAISO Tariff as if the references to the CAISO Tariff were referring to this Agreement.
- 9.6 Merger.** This Agreement constitutes the complete and final agreement of the Parties with respect to the subject matter hereof and supersedes all prior agreements, whether written or oral, with respect to such subject matter.
- 9.7 Severability.** If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the Parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination

unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.

- 9.8 Amendments.** This Agreement may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that require FERC approval shall not take effect until FERC has accepted such amendments for filing and made them effective. Nothing contained herein shall be construed as affecting in any way the right of the CAISO to unilaterally make application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder, including Attachment A, and PNM and TEP shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to Section 206 or any other applicable provision of the FPA and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by any other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.
- 9.9 Confidentiality.** Each Party's confidential information will be treated in accordance with Section 20 of the CAISO Tariff and any other applicable data sharing agreements in effect among the Parties.
- 9.10 Counterparts.** This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.



IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date hereinabove written.

California Independent System Operator Corporation

By: DocuSigned by:
Khaled Abdul-Rahman
048C598C28F6464...

Name: Khaled Abdul-Rahman

Title: vice President

Date: 10/21/2021

Public Service Company of New Mexico

By: DocuSigned by:
Manuel Sanchez
C3CAFEECDF5442A...

Name: Manuel Sanchez

Title: Director Power Operations

Date: 10/21/2021

Tucson Electric Power

By: DocuSigned by:
Erik Bakken
78C642D56A6C453...

Name: Erik Bakken

Title: VP, System Operations and Energy Resources

Date: 10/21/2021

ATTACHMENT A

SCOPE OF JOU MODEL IMPLEMENTATION AND JOU PILOT

[Sections 3.1 and 3.2]

I. Introduction

The learnings from the JOU Pilot will inform a future CAISO stakeholder process to consider the availability and application of the JOU Model solution more broadly in the CAISO Markets, which may lead to an amendment of the CAISO Tariff. In the meantime, this Attachment A to the Joint Owned Unit (JOU) Pilot Agreement supplements the CAISO Tariff as incorporated by Section 4.1 of the JOU Pilot Agreement and establishes the technical requirements for the JOU Pilot.

These technical requirements supplement the CAISO Tariff requirements for EIM Resource participation, including registration, modeling, bidding and settlement. Rules, procedures and requirements otherwise applicable to EIM Resource participation and operation of CAISO Market systems, including the associated data and integration requirements, shall continue to be governed by such other CAISO rules, procedures, and requirements, as applicable. Certain parameters described or referenced in this Attachment A are standard parameters in use in various CAISO systems, and may not be explicitly defined in the CAISO Tariff. These technical requirements—

- (a) Define the relationship between the JOU Parent Resource and the JOU Child Resources,
- (b) Establish what the JOU Resource operators Scheduling Coordinators are required to do, or are permitted or not permitted to do, and
- (c) Specify modifications of existing formulations or provide new formulations uniquely applicable to the JOU Pilot.

These technical requirements may be modified in accordance with Section 3.4 of the Agreement as may be necessary to resolve any conflict with CAISO Tariff provisions, ensure feasible outcomes from the JOU Pilot, increase the mutual benefit from the project, or account for unanticipated circumstances. Any changes to this Attachment A other than with respect to implementation details as provided in Section 3.4 of the Agreement, i.e., any change that affects the rates, terms and conditions of service, must be filed with FERC as an amendment in accordance with Section 9.8 of the Agreement.

II. JOU Model Implementation and JOU Pilot

Defined Terms and Acronyms

The following list of defined terms is in addition to any defined terms or acronyms described in the CAISO Tariff. Acronyms used throughout this Attachment A have been listed below although they may already be defined in the CAISO Business Practice

Manual for Definitions and Acronyms as posted on the CAISO website¹. Description of Master File parameters listed in this Attachment A can be found in the CAISO Business Practice Manual for Market Instruments as posted on the CAISO website².

1. JOU Resource: A Generating Unit with more than one entity receiving a share of its Energy and other attributes, where the shares are represented in different Balancing Authority Areas, either by their physical location or by pseudo-tie. It does not include shares represented in different Balancing Authority Areas via a dynamic schedule.
2. JOU Parent Resource: The modeled representation of the physical resource supporting the associated JOU Child Resources, as registered with the CAISO.
3. JOU Parent SC: Scheduling Coordinator entity representing the JOU Parent Resource.
4. JOU Child Resource: The logical models representing the shares of the JOU Parent Resource, as registered with the CAISO.
5. JOU Child SC: Scheduling Coordinator entity representing the JOU Child Resource.
6. Active JOU Child Resource: Active JOU Child Resource is a JOU Child Resource with Base Schedules or Bids in the Energy Imbalance Market for a given market interval.
7. Inactive JOU Child Resource: AJOU Child Resource without a Base Schedule or Bids in the Energy Imbalance Market for a given market interval.
8. Intermediate PMin: It is intermediate value of registered PMin calculated in accordance with Section 3.2 of this Attachment A.
9. LOL: Lower Operating Limit (taking into account PMin rerates)
10. Intermediate LOL: Intermediate Value of Lower Operating Limit
11. UOL: Upper Operating Limit (taking into account PMax derates)
12. LEL: Lower Economic Limit (Lower MW end of the SIBR bid)
13. UEL: Upper Economic Limit (Upper MW end of the SIBR bid)
14. DMLC: Default Minimum Load Cost
15. DSUC: Default Start Up Cost
16. DEB: Default Energy Bid
17. MLC: Minimum Load Cost
18. SUC: Start Up Cost (from bid for active children and summed up for parent)
19. Adjusted MLC: Adjusted Minimum Load Cost
20. Adjusted DMLC: Adjusted Default Minimum Load Cost
21. Adjusted SUC: Adjusted Start Up Cost
22. RIG: Remote Intelligence Gateway
23. GHG: Greenhouse Gas

¹CAISO list of acronyms

<https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Definitions%20and%20Acronyms>

² CAISO BPM for Market Instruments

<https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market%20Instruments>

- 24. DOT: Dispatch Operating Target
- 25. BAA: Balancing Authority Area
- 26. SUT: Start Up Time
- 27. MIN_OFF: Minimum Off Time
- 28. LRL: Lower Regulation Limit
- 29. URL: Upper Regulation Limit

JOU Model Implementation and JOU Pilot

1. JOU Resource Registration

- 1.1. A JOU Child Resource registration and logical model type must correspond to the registration and logical model type of the JOU Parent Resource, in accordance with the provisions of this Attachment A.
- 1.2. The JOU Parent SC will register the JOU Parent Resource with the CAISO in accordance with established CAISO Tariff provisions and BPM processes applicable to the registration of EIM Non-Participating Resources. The JOU Parent SC must be the EIM Entity SC of its Native BAA. The Scheduling Coordinator ID code associated with the JOU Parent Resource must not be associated with any other Resource ID.
- 1.3. The JOU Parent SC will register the mapping between JOU Child Resources and the JOU Parent Resource, including the percentage share associated with each JOU Child Resource. Any change in such shares may require an update to the registration of the JOU Child Resource through the applicable registration processes. These shares must be established as static values with the CAISO. The sum of percentage shares of all JOU Child Resources linked to a single JOU Parent Resource must equal 100 %.
- 1.4. The JOU Child Resource(s) of a JOU Parent Resource may be located in different BAAs, when established as a pseudo-tie from the Native BAA to the Attaining BAA.
- 1.5. The JOU Child SC must register the JOU Child Resource with the CAISO in accordance with established Tariff provisions and BPM processes applicable to the registration of EIM Participating Resources or EIM Non-Participating Resources.
 - 1.5.1. A JOU Child Resource registered as an EIM Non-Participating Resource must be represented by the EIM Entity SC of the BAA it is represented in either by physical location or pseudo-tie, as its JOU Child SC
 - 1.5.2. A JOU Child Resource is registered as an EIM Participating Resource, may be represented by any certified EIM Participating Resource SC as its JOU Child SC, but cannot be represented by the EIM Entity SC associated with its JOU Parent Resource.
 - 1.5.3. Each JOU Child Resource may have a different SC compared to the other JOU Child Resources linked to its JOU Parent Resource.
- 1.6. The CAISO will map the JOU Parent Resource to a Cnode.

- 1.7. If a JOU Child Resource and the JOU Parent Resource are in the same BAA; the JOU Child Resource will be mapped to a different Cnode but linked to the Cnode of its JOU parent resource.
- 1.8. If a JOU Child Resource and the JOU Parent Resource are in different BAAs; the JOU Child Resource will be mapped to a different Cnode in the Attaining BAA but linked to the Cnode of its JOU parent resource
- 1.9. JOU Parent Resources and JOU Child Resources will be modeled as model type Non-MSG Generator. All other model types as listed below will not be available to JOU Parent Resources and JOU Child Resources:
 - NGR (including hybrid resources)
 - PDR
 - COG
 - Participating Load
 - PSH
 - Use Limited (UL)
 - MSG
- 1.10. The JOU Parent SC and JOU Child SC may register the following Master File parameters independently for their respective resources. An example of such parameters have been provided below. The CAISO will provide the entire list of applicable Master File parameters to the Parties as part of the JOU Model and JOU Pilot implementation, which will supersede this list below.
 - BAA
 - SC
 - RC Entity
 - Resource ID
 - Parent/Child Identification
 - PMin
 - PMax
 - Fuel region
 - Lower Regulation Limit (MW)
 - Upper Regulation Limit (MW)
 - Ramp_MW_Output
 - Ramp_Min_Rate
 - Ramp_Max_Rate
 - Meter Data Interval
 - CAISO Polled Flag
 - BSC
 - JOU Parent Mapping
 - Percentage Share
 - DAM Certification Flag

- RTM Certification Flag
- EIM Participation Flag
- Others (as provided by the CAISO)

1.11. With regards to the registration of PMin and Lower Regulation Limit for JOU Child Resources:

- 1.11.1. If the sum of the individual PMin or LRL of each JOU Child Resource is less than the individual PMin or LRL of the JOU Parent Resource, and the individual PMin or LRL of the JOU Parent Resource is greater than or equal to the product of the total number of JOU Child Resources multiplied times 1 MW; the JOU Child SC may register their PMin or LRL capacities at 1 MW.
- 1.11.2. If the sum of the individual PMin or LRL of each JOU Child Resource is equal to the individual PMin of the JOU Parent Resource, or the individual PMin or LRL of the JOU Parent Resource is less than the product of the total number of JOU children multiplied times 1 MW; the JOU Child SC may register the PMin or LRL capacities of their resources at their individual values
- 1.11.3. If the sum of the individual PMin or LRL values of the JOU Child Resources exceed the individual PMin or LRL value of the JOU Parent Resource, the JOU Child SC will not be allowed to register the individual PMin or LRL values of the JOU Child Resources.
- 1.11.4. The individual PMax and URL value of the JOU Parent Resource must equal the sum of the individual PMax and URL values of the associated JOU Child Resources.

1.12. The Master File registered ramp rate values for each JOU Child Resource will be limited a single segment extending from the PMin to the PMax. The sum of the Master File registered ramp rates of the JOU Child Resources must not exceed the Master File registered maximum ramp rate of the JOU Parent Resource.

1.13. The JOU Parent SC will register the Master File parameters for the JOU Parent Resource as applicable and the corresponding parameters for the JOU Child Resource will be derived as described in the following table. All parameters marked as "x" under the column titled "Child Match Parent" must be submitted solely for the JOU Parent Resource, and will not be considered applicable if they are submitted for the JOU Child Resource. The column titled "Special Child Derivation" identifies any derivation principles or methodologies for Master File parameters submitted at the JOU Parent Resource level. The CAISO will provide the entire list of parameters to the Parties as part of the JOU Model and JOU Pilot implementation, which will supersede the list provided below.

Master File Parameter	Child Match Parent	Special Child Derivation
JOU Flag	x	
Fuel Type	x	
Technology Type	x	
AS flags (spin, non-spin, regulation)	x	
Ramp Up/Down	x	
MDS	x	
MDT	x	
MUT	x	
SU Ramp Time	x	
LMP Eligibility Flag	x	
Heat Emission Rate	x	
Start Down Time (aka Cooling Time)	x	
SUT	x	
Default GDF	x	
DEB Options Ranking	x	
Default DEB Options Ranking	x	
GHG Emission Rate	x	
GHG Compliance Obligation Flag	x	
VOMC	x	
SUC		Null
SUE		Null
SUF		Null
HR MW		Null
HR		Null
HAVGC		Null
ROPR		Null
RREG		Null
Lower Forbidden Region MW (LFR)		Null

Master File Parameter	Child Match Parent	Special Child Derivation
Upper Forbidden Region MW (UFR)		Null
Forbidden Region Crossing Time (FRCT)	X	

- 1.13.1. The JOU Child SC must ensure that the JOU Child Resource name will be structured in a manner to provide ease of reference to the associated JOU Parent Resource. The CAISO may reject the proposed name from the JOU Child SC if it does not create ease of reference to the JOU Parent Resource name.

2. Telemetry Requirements

- 2.1. The JOU Parent SC is limited to and required to submit the physical telemetry and Meter Data for the JOU Parent Resource, and the JOU Child SC is limited to and required to submit the logical telemetry and Meter Data for the JOU Child Resource.
- 2.2. Regarding JOU Parent Resource and JOU Child Resources that are certified for AS, the JOU Parent SC and JOU Child SC must submit direct telemetry for their respective resources using a real-time device or RIG.

3. Calculated Costs for JOU Resources

- 3.1. The JOU Child Resource will receive the same greenhouse gas maximum compliance cost calculated for the JOU Parent Resource.
- 3.2. The calculation of the Intermediate PMin of the JOU Child Resource will be as follows:
- 3.2.1. If the sum of the individual PMin of the JOU Child Resources equal the PMin of the JOU Parent Resource, the Intermediate PMin of the JOU Child Resource will be equal to its PMin.
- 3.2.2. If the sum of the individual PMin of the JOU Child Resources does not equal the PMin of the JOU Parent Resource:
- 3.2.2.1. The Intermediate PMin of each JOU Child Resource will be the maximum of the individual PMin and pro-rata PMin of the JOU Child Resource, where the pro-rata PMin is the product of the PMin of the JOU Parent Resource and the percentage share associated with the JOU Child Resource.
- 3.2.3. The calculation of the Intermediate LOL will follow the same methodology, replacing PMin with LOL in the calculations.
- 3.3. The manual consult price will be calculated solely for the JOU Parent Resource.

- 3.4. The Negotiated Rate Option is the sole DEB option available to JOU Parent Resources and JOU Child Resources. Each JOU Child SC will be responsible for establishing the Negotiated Rate Option DEB for its JOU Child Resource.
- 3.5. The energy price index calculated for the JOU Parent Resource will be applied to its JOU Child Resources.
- 3.6. The major maintenance adder component and negotiated major maintenance adder of the Minimum Load Cost and Start-Up Cost calculated for the JOU Parent Resource will be applied to its JOU Child Resources using a pro-rata allocation based on the percentage share associated with each JOU Child Resource. The JOU Parent SC will be responsible for applying for the negotiated major maintenance adder.

4. Outage Management for JOU Resources

- 4.1. The JOU Parent SC will be allowed to submit and view outages solely for the JOU Parent Resource.
- 4.2. The JOU Parent SC may view outages applicable to its JOU Child Resources only if authorized by the applicable JOU Child SC. The JOU Child SC may delegate authority to the JOU Parent SC of its JOU Parent Resource to submit outages on its behalf.
- 4.3. The JOU Child SC will be allowed to submit and view outages solely for the JOU Child Resource it represents. The table below describes the categories of outages that can be submitted for the JOU Parent Resource and the JOU Child Resource. For those outages that can only be submitted for the JOU Parent Resource, the outages will be translated for application to the JOU Child Resource in the manner described below.
 - 4.3.1. A PMin re-rate outage on JOU Parent Resource will be applied to its JOU Child Resources in accordance with calculation methodology for Intermediate LOL described in this Attachment A.
 - 4.3.2. An out of service outage on JOU Parent Resource will set the same out of service outage status for its JOU Child Resources, including any subsequent modifications to this outage status.
 - 4.3.3. A ramp rate de-rate outage on JOU Parent Resource will be applied to its JOU Child Resources as described in this Attachment A.

Outage Category	Allowed to be submitted for JOU Parent Resource	Allowed to be submitted for JOU Child Resource
Out Of Service	X	
Pmin Rerate	X	
Pmax Derate	X	X
Ramp rate Derate	X	

- 4.4. The JOU Child SC will not be allowed to view outages on the JOU Parent Resource or other associated JOU Child Resources, unless the JOU Child SC is

authorized to view outages applicable to another JOU Child Resource by the responsible JOU Child SC.

- 4.5. This scaling factor methodology is applied when JOU Parent Resource Master File registered ramp rate is subject to de-rates. A scaling factor is calculated by utilizing the following methodology and the values applicable to the JOU Parent Resource: the de-rated highest ramp rate segment divided by the Master File registered highest ramp rate segment. The de-rates of the JOU Parent Resource Master File registered ramp rates will be translated to the JOU Child Resources by multiplying the JOU Child Resource's Master File registered ramp rates with the scaling factor.
- 4.6. The treatment of overlapping outages between the JOU Parent Resource and its JOU Child Resources will be treated in accordance with the outage management provisions of the CAISO Tariff applicable to EIM Resources.
- 4.7. If an out of service outage on the entire JOU Parent Resource is applied to its JOU Child Resources, the JOU Child SC will be allowed to view, but not edit, the translated outage data on its JOU Child Resource.

5. Market Participation for JOU Resources

- 5.1. The JOU Child Resource will be allowed to participate in the Energy Imbalance Market in the same manner as an EIM Participating Resource in accordance with the CAISO Tariff and this Attachment A. The JOU Child Resources of a single JOU Parent Resource will be allowed to have different Energy and Flexible Ramp Up/Down bids. The JOU Child SC will be allowed to only view the bids it has submitted
- 5.2. The JOU Parent SC will not be allowed to submit Bids and Base Schedules, or provision Ancillary Services. The JOU Parent SC will not be allowed to view any Bids or Base Schedules it has not submitted.
- 5.3. Only the JOU Child SC may submit a revised DEB curve, and will only be allowed to review the revised DEB curves it has submitted.
- 5.4. The Default SUC and Default MLC calculated for the JOU Parent Resource will be applied to the JOU Child Resource in a pro-rata manner using the percentage share associated with each JOU Child Resource. A JOU Child SC will only be allowed to view the calculated Default SUC and Default MLC for its JOU Child Resource, irrespective of whether it is an Active or Inactive JOU Child Resource.
- 5.5. The Reasonableness Threshold for SUC and MLC calculated for the JOU Parent Resource will be applied to the JOU Child Resource in a pro-rata manner using the percentage share of the individual JOU Child Resource.
- 5.6. The JOU Child SC may submit revised values of the Default SUC and Default MLC for an Active JOU Child Resource, and will have the sole right to access and view the submittals. The submitted revised Default SUC and Default MLC for Active JOU Child Resources will be validated by the CAISO.
- 5.7. The JOU Child SC will have the sole right to submit and view the Base Schedules for Energy and Ancillary Services for the JOU Child Resource.

- 5.8. The submitted Base Schedules on the JOU Child Resources will be deemed valid even if the aggregate of the Base Schedules is lower than the PMin of the JOU Parent Resource. The submittal and the validation of the Base Schedules will result in the JOU Parent Resource being deemed to be in Start-Up subject to existing additional conditions defined below under Section 5.9.
- 5.9. The JOU Parent Resource will be transitioned to Start-Up mode when the following conditions are all met: a) submitted Base Schedules on the JOU Child Resources, in aggregate, is lower than the PMin of the JOU Parent Resource, and b) the JOU Parent Resource has its Commitment Status as "Off", and c) the JOU Parent meets its MIN_OFF time requirement. If the above condition under c) is not satisfied, the submitted Base Schedules are ignored and the JOU Parent Resource retains its Commitment Status as "Off". Moreover, the following steps will be taken:
- 5.9.1. The Real-Time Base Schedule balancing test and the flexible ramp test will utilize the submitted Base Schedules of the JOU Child Resources. The flexible ramp test will utilize the Master File registered ramp rate of the JOU Child Resources, subject to adjustments due to de-rates or revisions of the Master File registered ramp rate of the JOU Parent Resource.
- 5.10. While the JOU Parent Resource is in Start-Up, no Bids for the JOU Child Resources will be utilized in RTM or published as part of the final Bid set by the applicable CAISO web services, and only zero MW DOTs for the JOU Child Resources will be created.
- 5.11. When a JOU Parent Resource has Inactive JOU Child Resources, the Default SUC of the Inactive JOU Child Resource will be allocated to the Active JOU Child Resources in proportion to their relative percentage shares.

*Adjusted SUC (due to Inactive JOU Child Resource) = Sum of Default SUC of all Inactive JOU Child Resources * (ratio of percentage share of Active JOU Child Resource over the sum of percentage shares of all Active JOU Child Resources.)*

The allocation of Default MLC of the Inactive JOU Child Resources will follow the above-described formula, by replacing SUC with MLC.

- 5.12. When a JOU Parent Resource has a PMin re-rate, the MLC of all Active JOU Child Resources and the Default MLC of Inactive JOU Child Resources, will be adjusted in accordance with the CAISO Tariff, considering any Intermediate PMin or Intermediate LOL created for the JOU Child Resource. Any such adjustment will have priority over any re-allocation of the Default MLC of an Inactive JOU Child Resource to the Default MLC of Active Child Resources of the same JOU Parent Resource.
- 5.12.1. The Adjusted MLC (for Active JOU Child Resources) and Adjusted Default MLC (for all JOU Child Resources) is equal to the sum of the

MLC (for Adjusted MLC) or Default MLC (for adjusted Default MLC), and the product of the DEB and the difference between the calculated Intermediate LOL and Intermediate PMin.

*Adjusted MLC or Adjusted DMLC (due to PMin re-rate) = MLC or Default MLC * (DEB * [Intermediate LOL - Intermediate PMin])*

5.12.2. When a JOU Parent Resource has a PMin re-rate as well as Inactive JOU Child Resources, the Adjusted MLC is calculated as follows:

*The Adjusted MLC derived under Section 5.15.1 of this Attachment A is now adjusted using the formula applied towards adjustment of MLC of Active JOU Child Resources to re-allocate the Default MLC of Inactive JOU Child Resources. Adjusted MLC (due to Inactive JOU Child Resource) = Adjusted MLC (due to PMin re-rate) + (Adjusted DMLC of Inactive JOU Child Resource * [ratio of percentage share of Active JOU Child Resource over the sum of percentage shares of all Active JOU Child Resources])*

- 5.13. The Adjusted MLC and Adjusted SUC of the JOU Parent Resource will be the sum of the Adjusted MLCs and Adjusted SUCs of all its Active JOU Child Resources, respectively, when such adjustments are made in accordance with Sections 5.11 and 5.12 of this Attachment A.
- 5.14. The JOU Child Resources will be constrained to the same Commitment Status as the JOU Parent Resource.
- 5.15. There will be no Commitment Costs modeled for a JOU Parent Resource during its Self-Commitment Period, when the JOU Parent Resource is in a Self-Commitment Period due to one or more of its JOU Child Resources being subject to a Self-Commitment Period.
- 5.16. When one JOU Child Resource submits a Self-Schedule or a Base Schedule, all Active JOU Child Resources belonging to the same JOU Parent Resource will be entered into a Self-Commitment Period with Self-Schedules or Base Schedules to at least their PMin. The JOU Parent Resource of these JOU Child Resources will also be entered into a Self-Commitment Period.
- 5.17. The JOU Parent Resource will be constrained by certain physical constraints during its Commitment Period as identified below:
- PMin
 - Lower Regulation Limit
 - Lower Forbidden Region
 - Upper Forbidden Region
 - Ramp rate
 - Physical transmission constraints

The constraints enforced on the JOU Parent Resource will not be enforced on the JOU Child Resource Ramp Rates.

- 5.18. JOU Child Resource schedules will be constrained by various limits during its Commitment Period as identified below:
- Power balance constraint of the Native BAA or Attaining BAA
 - Scheduling limits of the Native BAA or Attaining BAA
 - Capacity constraints and scheduling limits of the JOU Child Resource.
 - Lower Economic Limit and Upper Economic Limit of JOU Child Resource
- 5.19. For a JOU Child Resource that is registered as an EIM Participating Resource, the GHG allocation to the various GHG compliance areas will be calculated using its EIM Bid Adder.
- 5.20. JOU Child Resources will have the LMPM eligibility flag enabled automatically if their JOU Parent Resource has the LMPM eligibility flag enabled, and the Dynamic Competitive Path Assessment process will mitigate the JOU Child Resource to its DEB if applicable.
- 5.21. The calculation of the counter flow capacity will be calculated using the registered attributes of the JOU Child Resources
- 5.22. There may be restrictions imposed on EIM Manual Dispatch Instructions submitted by the Native BAA to dispatch the Start-Up or Shut-Down of a JOU Parent Resource. The Native BAA will have the sole right to submit these Start-Up or Shut-Down instructions and such instructions will be communicated to the JOU Parent SC.
- 5.23. The Attaining BAA of the JOU Child Resource will not be allowed to submit EIM Manual Dispatch Instructions affecting its Start-Up or Shut-Down, but can do so for dispatching it to a certain MW level. These instructions will be communicated to the JOU Child SC.
- 5.24. All EIM Manual Dispatch Instructions on a JOU Parent Resource will be applicable to its JOU Child Resources as well.
- 5.25. When a JOU Parent Resource is subject to EIM Manual Dispatch Instruction for Start-Up and there are no corresponding EIM Manual Dispatch Instructions on the JOU Child Resources, there will be EIM Manual Dispatch Instructions created for its JOU Child Resources to dispatch them to the appropriate MW value to support the JOU Parent Resource Commitment Period. These EIM Manual Dispatch Instructions will dispatch the Active JOU Child Resources to the PMin, if the sum of the individual PMin of the JOU Child Resources equals the PMin of the JOU Parent Resource; otherwise the Active JOU Child Resources will be dispatched to the appropriate MW level to ensure that the sum of their individual dispatched MW levels equals the PMin of the JOU Parent Resource.
- 5.25.1. If the EIM Manual Dispatch Instruction for Start-Up of the JOU Parent Resource is a verbal post-market EIM Manual Dispatch Instruction and there are no corresponding EIM Manual Dispatch Instructions on the JOU Child Resources, there will be EIM Manual Dispatch Instructions created for the JOU Child Resources to dispatch them to their Intermediate PMin. The dispatch to Intermediate PMin will only apply to Active JOU Child

Resources unless all JOU Child Resources are Inactive JOU Child Resources.

- 5.26. When a JOU Parent Resource is subject to EIM Manual Dispatch Instruction for Shut-Down, there will be EIM Manual Dispatch Instructions created for its Active JOU Child Resources to dispatch them to zero (0) MW value to support the JOU Parent Resource Commitment Period.
 - 5.26.1. If the EIM Manual Dispatch Instruction that dispatches the JOU Parent Resource to Shut-Down is a verbal post-market EIM Manual Dispatch Instruction, there will be EIM Manual Dispatch Instructions created for the JOU Child Resources to dispatch them to 0 MW. The dispatch to zero MW will only apply to Active JOU Child Resources unless all JOU Child Resources are Inactive JOU Child Resources.
- 5.27. If the EIM Manual Dispatch Instructions for a JOU Parent Resource or a JOU Child Resource conflict with previous EIM Manual Dispatch Instructions, or apply to an Inactive JOU Child Resource, the following actions will be taken:
 - 5.27.1. The Native BAA and Attaining BAA will be notified of the conflict, and will individually and jointly be responsible for the resolution of such identified conflicts,
 - 5.27.2. The JOU Parent SC and JOU Child SC will be notified of the conflict.
- 5.28. All EIM Manual Dispatch Instructions submitted for the JOU Child Resources will be aggregated and applied to its JOU Parent Resource, if the EIM Manual Dispatch Instructions are of the same type and can be aggregated. Such EIM Manual Dispatch Instructions will be communicated to the Native BAA and the JOU Parent SC.
- 5.29. The Schedules and Dispatch Instructions applicable to the JOU Child Resources will be utilized to construct appropriate Schedules and Dispatch Instructions for the JOU Parent Resource. For the JOU Parent Resource, an Energy Schedule will be derived as the sum of Energy Schedules of all of its JOU Child Resources.
- 5.30. There will be no calculation of Expected Energy, Expected Energy allocation, or commodity allocation, for a JOU Parent Resource.
- 5.31. If the Base Schedules of the JOU Child Resources associated with the same JOU Parent Resource, in aggregate, is lower than the PMin of the JOU Parent Resource, the Expected Energy of the JOU Child Resource will be calculated in accordance with the following methodology:
 - 5.31.1. If all the Dispatch Operating Targets of the JOU Child Resources are zero, the JOU Parent Resource will be considered to be in Start-Up, and the Expected Energy for all the JOU Child Resources will be calculated in accordance with EIM Base Schedule submission deadline rules.
 - 5.31.2. If any of the Dispatch Operating Targets of the JOU Child Resources are greater than 0.01 MW, the JOU Parent Resource is considered to be in Commitment Status type "On", and Expected Energy for all the JOU Child Resources will be calculated in accordance with the CAISO Tariff.

- 5.32. If the Base Schedules of the JOU Child Resources associated with the same JOU Parent Resource, in aggregate, is equal to or higher than the PMin of the JOU Parent Resource, the Expected Energy of the JOU Child Resource will be calculated in accordance with the CAISO Tariff provisions applicable to EIM Resources.
- 5.33. The JOU Parent SC will only receive access to the data published for its JOU Parent Resource, while the JOU Child SC will only receive access to the data published pertaining to its JOU Child Resource.
- 5.34. The JOU Parent SC will only receive access to ADS Instructions associated with its JOU Parent Resource, while the JOU Child SC will only receive access to ADS instructions associated with its JOU Child Resource.

6. Metering

- 6.1. The JOU Parent SC will ensure that revenue grade meters are utilized for the purposes of submitting physical Meter Data to CAISO for the JOU Parent Resource. The CAISO will not use any Meter Data submitted by the JOU Parent for the JOU Parent Resource, for settling any Charge Codes.
- 6.2. For a JOU Child Resource, its JOU Child SC will submit Meter Data in accordance with the particular JOU Child Resource's SQMD Plan. For the purposes of the SQMD Plan, the JOU Child SC will ensure metering devices are established at the respective Inter-Ties where the Energy from the JOU Child Resource is measured.
- 6.3. The JOU Parent SC of the JOU Parent Resource and JOU Child SCs of its JOU Child Resources will ensure that their submitted Meter data have an equal level of granularity.
- 6.4. All T + 52B Meter Data submitted for a JOU Parent Resource will be compared against its JOU Child Resources, and the Meter Data for both types of resources will fail validation if their difference is outside of the specified tolerance. This specified tolerance is established to account for numerical rounding errors caused by the utilization of JOU Parent Resource Meter Data for purposes of logically calculating JOU Child Resource Meter Data. The Meter Data for the JOU Child Resources that failed validation will still be used for Settlements without any modification by CAISO. A daily report, detailing the Meter Data intervals that failed validation and associated supporting information, will be generated and provided to the applicable JOU Parent SC's and JOU Child SC's. The JOU Parent SC and JOU Child SCs are responsible for correcting and re-submitting the Meter Data intervals that failed validation, and failure to do so will be addressed in accordance with CAISO Tariff provisions applicable to Meter Data submissions.

7. Settlements

- 7.1. All JOU Child Resources will be subject to Settlement in accordance with the CAISO Tariff provisions applicable to EIM Participating Resources and EIM non-participating resources. The JOU Parent Resource will not be subject to any Settlement, nor will there be any administrative fees or charges applicable to the JOU Parent Resource with respect to the implementation and operation of the unique Scheduling Coordinator ID code associated with the JOU Parent Resource.
- 7.2. As part of the Bid Cost Recovery process, commitment cost qualification calculations will be performed for the JOU Parent Resource by comparing the submitted Meter Data and effective PMin (and any LOL) of the JOU Parent Resource. All JOU Child Resources of the JOU Parent Resource will receive the outcome of this commitment cost qualification process.
- 7.3. For calculating the Persistent Deviation Metric and Real-Time Performance Metric, there will be a ramp rate calculated for the JOU Child Resources in the following manner: the delta of the DOTs from consecutive Settlement Intervals divided the time difference between those Settlement Intervals.

ATTACHMENT B

NOTICES

[Sections 9.2]

PNM

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Technical representative regarding Attachment A

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CAISO

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Technical representative regarding Attachment A