

August 3, 2017

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

**Re: California Independent System Operator Corporation
Docket No. ER17-____-000
Black Start and System Restoration**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this filing to revise its tariff rules for allocating costs associated with black start procurement.¹ The CAISO requests that the Commission accept the tariff revisions contained in this filing on 90 days' notice and make them effective November 1, 2017.

I. Introduction and Summary of Tariff Revisions

Black start is a procedure by which a resource self-starts without an external source of electricity. The output from the resource can then help restore power following a system or local area outage. Currently, the CAISO secures black start capability from participating generators pursuant to black start agreements.² These agreements currently include a reservation fee of \$0. This tariff amendment does not change the CAISO's authority to contract for black start capability, but simply proposes cost allocation rules for costs the CAISO plans to incur to procure additional black start capability. The CAISO also proposes to reorganize its black start and system restoration tariff provisions by consolidating them and removing language that should not apply to black start service.

¹ The CAISO submits this filing pursuant to Section 205 of the Federal Power Act (FPA), 16 U.S.C. § 824d, and Section 35.13 of the Commission's regulations, 18 C.F.R. § 35.13. Capitalized terms not otherwise defined herein have the meanings set forth in Appendix A to the CAISO tariff.

² CAISO tariff section 8.3.1: "The CAISO will procure Black Start capability through individual contracts with Scheduling Coordinators for Reliability Must-Run Units and other Generating Units which have Black Start capability." See also CAISO tariff section 8.3.5: "The CAISO shall contract annually (or for such other period as the CAISO may determine is economically advantageous) for Black Start Generation."

The CAISO has determined that it needs to procure incremental black start capability to enhance system restoration times in the Greater San Francisco Bay Area.³ Unlike the CAISO's existing black start agreements that have a \$0 reservation fee, procuring incremental black start capability will create costs that the CAISO must allocate to market participants. The CAISO proposes to designate the costs of black start capability it procures as reliability services costs under the CAISO tariff and allocate them to the participating transmission owner in whose service area the black start generator(s) will be located. The participating transmission owner will then recover these costs from its transmission ratepayers pursuant to its Commission-approved reliability services tariff.⁴

II. Background

In the early years of its operation, the CAISO relied on multiple resources to provide black start capability to the system. The CAISO secured this capability through either reliability must run agreements or interim black start agreements.⁵ Under a reliability must run agreement, the CAISO contracted for the ability to dispatch a generating unit to meet a reliability need, including the capability to provide black start service. Under black start agreements, the CAISO contracted with generating units either owned by or under contract to incumbent utilities. Over the years, the CAISO has reduced its reliance on reliability must run agreements. In addition, the North American Electric Reliability Corporation (NERC) has adopted new reliability standards involving critical infrastructure and protection that have increased requirements for personnel training as well as cyber and physical security for assets critical to the reliability of the bulk electric system. These assets include generating units providing black start capability

³ See CAISO Draft Final Proposal dated March 14, 2017 at 3.
http://www.caiso.com/Documents/DraftFinalProposal_BlackStart_SystemRestorationPhase2.pdf

⁴ See e.g., Section 15 of Pacific Gas and Electric Company's Transmission Owner Tariff
https://www.pge.com/includes/docs/pdfs/shared/customerservice/nonpgeutility/electrictransmission/tariffs/transmission_owner_tariff.pdf

⁵ The CAISO tariff refers to these agreements as interim black start agreements, which the CAISO tariff defines as follows:

An agreement entered into between the CAISO and a Participating Generator (other than a Reliability Must-Run Contract) for the provision by the Participating Generator of Black Start capability and Black Start Energy on an interim basis until the introduction by the CAISO of its Black Start auction (or until terminated earlier by either party in accordance with its terms).

The CAISO has not pursued, and does not intend to pursue, an auction process for black start.

under a system restoration plan.

In 2011, the Commission approved NERC Reliability Standard EOP-005-2 that requires, among other things, that transmission operators have a system restoration plan approved by their reliability coordinator.⁶ NERC Reliability Standard EOP-005-2 also requires a transmission operator to implement performance-testing requirements to verify that each black start resource is capable of meeting the requirements of a system restoration plan.⁷

In 2013, the CAISO filed tariff revisions to specify how the CAISO determines its black start needs pursuant to a system restoration plan that meets the requirements of EOP-005-2.⁸ Under these tariff provisions, the CAISO will develop a system restoration plan in consultation with participating transmission owners who also are required to develop system restoration plans under Reliability Standard EOP-005-2.⁹ The CAISO may identify black start needs for the CAISO system not identified in participating transmission owners' system restoration plans.¹⁰ As required by Reliability Standard EOP-005-2, Peak Reliability has approved the CAISO's system restoration plan.

Separately, the CAISO, in consultation with participating transmission owners and participating generators, amended existing black start agreements to incorporate testing requirements under EOP-005-2. The Commission accepted these amended agreements. At this time, these agreements provide the black start capability the CAISO relies upon in its system restoration plan under Reliability Standard EOP-005-2. Again, these agreements have a \$0 reservation fee and, as such, the CAISO does not allocate black start capability costs from

⁶ System Restoration Reliability Standards 134 FERC ¶ 61215 (Order 749) March 2011 at P 13. See also Requirement 1 of EOP-005-02 available at <http://www.nerc.com/files/EOP-005-2.pdf>

NERC has proposed changes to EOP-005-2 that are pending approval at the Commission. These proposed changes do not modify the requirements affecting transmission operators or generator operators described in this filing. See Docket RM17-12 Petition of NERC for approval of proposed emergency operations reliability standards. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14558400>

⁷ See Requirement 9 of EOP-005-02 available at <http://www.nerc.com/files/EOP-005-2.pdf>

⁸ CAISO filing dated January 3, 2013 in Commission Docket ER13-699. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13146779>

See also Commission delegated order dated February 23, 2013, accepting the CAISO's tariff revisions in docket ER13-699: <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13180962>

⁹ Only CAISO participating transmission owners registered as transmission operators under the NERC functional model must develop system restoration plans under EOP-005-2.

¹⁰ See CAISO tariff section 8.2.3.4.

those agreements to market participants.¹¹

In 2016, as part of its efforts to review its system restoration plan, the CAISO determined that additional black start capability is necessary to ensure service restoration time in the Greater San Francisco Bay Area during a black start event is reasonably consistent with that of other major population centers in the state of California. To secure this additional capability, the CAISO has started a process to contract with a participating generator(s) on a cost-of-service basis.¹² Under Section 205 of the FPA, the black start generator will need to submit any agreement to the Commission that includes its costs to provide black start capability to the CAISO system.¹³

Today, the CAISO does not allocate black start capability costs because it does not incur these costs under black start agreements. However, the CAISO's existing tariff provides that it will allocate black start costs to scheduling coordinators with measured demand, excluding exports and any demand for which a metered sub-subsystem operator has self-provided black start.¹⁴ The CAISO does not believe this allocation approach is necessarily appropriate for procuring incremental black start capabilities to enhance restoration times in a participating transmission owner's service area. The CAISO proposes to amend its tariff to allocate black start capability costs to transmission customers who benefit directly from this incremental capability. Specifically, the CAISO

¹¹ The CAISO understands that the participating transmission owners recover any costs they may incur to secure black start capability under these agreements through retail rates charged to bundled customers. It is possible that participating transmission owners will also seek to recover any costs of providing black start capability under these existing agreements as reliability services costs. Although the CAISO's proposed tariff revisions allow for this outcome, the CAISO expects any such transition would require isolating the costs of providing black start capability on an ongoing basis and implementing offsetting adjustments to retail bundled rates.

¹² The CAISO issued a market notice on June 15, 2017 requesting that interested providers submit proposal to provide black start capability to support the Greater Bay Area by July 31, 2017: <http://www.caiso.com/Documents/BlackStart-SystemRestorationPhase2Request-ProposalFinalDocumentsPosted.html>

¹³ See 16 U.S.C. § 824d (c); See also 18 C.F.R. 35.1.

¹⁴ See CAISO tariff section 11.10.2, which states in part: "The cost of Voltage Support and Black Start shall be allocated to Scheduling Coordinators as described in Sections 11.10.7 and 11.10.8." CAISO tariff section 11.10.8 provides:

The Black Start Energy payment user rate for any Settlement Period will be calculated based on the sum of Black Start Energy payments to Scheduling Coordinators paid in accordance with Section 11.10.1.5 . . . The Black Start Energy user charge for any Settlement Period for a Scheduling Coordinator will be the Black Start Energy payment user rate multiplied by the quantity of Measured Demand, excluding exports to neighboring Balancing Authority Areas and excluding Demand within an MSS except as provided by Section 4.9.4.4, for which that Scheduling Coordinator is responsible in that Settlement Period.

proposes to allocate these capability costs as reliability services costs to the participating transmission owner in whose service area the black start generator is located.

III. Proposed Tariff Revisions

The CAISO's tariff revisions clarify how the CAISO will allocate costs for black start capability under a black start agreement. The CAISO also proposes to move tariff sections regarding black start from tariff sections regarding ancillary services the CAISO secures through its day-ahead and real-time market processes. Reorganizing and consolidating the CAISO's black start tariff provisions will make it easier for market participants, and other affected interests, to identify relevant tariff rules governing the provision and settlement of black start. In addition, the CAISO proposes to remove from its tariff various black start-related tariff provisions that are outdated or otherwise do not apply to black start service. For example, the CAISO is eliminating Part E of Appendix K regarding certification of resources to provide black start. The CAISO currently conducts tests of resources pursuant to its operating procedures and NERC Reliability Standard EOP-005-2 to validate that resources under black start agreements are capable of performing black start.¹⁵ There is no additional opportunity to certify a resource to offer black start and, as such, the provisions of Part E of Appendix K of the CAISO tariff currently do not apply. Attachment A hereto contains a matrix identifying each tariff change the CAISO proposes and an accompanying rationale for each change.

Black start requires resources identified in an approved system restoration plan to have certain technical capabilities to help re-energize a system or local area after a widespread disruption. It would be inequitable to shift costs to meet a system restoration need of customers in one participating transmission owner's service area to customers in another participating transmission owner's service area, particularly if the latter transmission owner has secured adequate black start capability to meet system restoration targets. Moreover, if the CAISO needs to procure incremental black start capability to enhance restoration times or for other reasons in a participating transmission owner's service area, allocating the costs of that procurement to the participating transmission owner that benefits is consistent with basic cost causation principles. Accordingly, the CAISO proposes to invoice the incremental costs of black start capability under a black start agreement as reliability services costs to the participating transmission owner in whose service area the black start generating unit is located.¹⁶ The

¹⁵ See CAISO Operating Procedure 5360: <http://www.caiso.com/Documents/5360.pdf>

¹⁶ The CAISO will continue to allocate the costs of energy associated with black start dispatches to scheduling coordinators with measured demand. This allocation of costs remains reasonable because all measured demand on the system at the time of a real-time dispatch is consuming energy.

CAISO charges reliability services costs to individual participating transmission owners and the transmission owner then passes them through to its transmission customers under the participating transmission owner's tariff, through a reliability services rate schedule.

In Appendix A to the CAISO tariff, the CAISO proposes to amend the definition of reliability services costs (underlined text reflects additions) as follows:

- Reliability Services Costs

The costs associated with services provided by the CAISO: 1) that are deemed by the CAISO as necessary to maintain reliable electric service in the CAISO Balancing Authority Area; and 2) whose costs are billed by the CAISO to the Participating TO pursuant to the CAISO Tariff. Reliability Services Costs include costs charged by the CAISO to a Participating TO associated with service provided under a Reliability Must-Run Contract, or a Black Start Agreement, as well as Exceptional Dispatches and Minimum Load Costs associated with units committed for local reliability requirements.¹⁷

The CAISO also proposes to add a new tariff section 11.4.2 to state:

The CAISO shall allocate payments for Black Start capability under a Black Start Agreement as Reliability Services Costs to the Participating Transmission Owner in whose Service Area the Black Start Generating Unit is located.

Classifying black start capability costs as reliability services costs is consistent with how the CAISO has allocated the costs of black start capability it previously procured under a reliability must run agreement. This approach allocates the cost of a generating unit secured to solve a reliability need to the participating transmission owner in whose system the reliability need exists. It is just and reasonable to allocate black start costs in a similar manner because the reliability need identified by the CAISO in the Greater San Francisco Bay Area that a black start generating unit(s) will help resolve exists within a participating transmission owner's service area.

Under its current tariff, the CAISO develops its system restoration plan in coordination with participating transmission owners who are transmission operators under NERC's functional model. These entities must also develop system restoration plans pursuant to Reliability Standard EOP-005-02. To the

¹⁷ See proposed revision to Appendix A to CAISO tariff, Definitions, Reliability Services Costs.

extent these system restoration plans incorporate sufficient black start capability, either from resources already owned by or under contract to the participating transmission owner, the CAISO will not need to secure additional black start capability.

During the CAISO's stakeholder process for this initiative, one stakeholder proposed that the CAISO amend its tariff to allocate black start capability costs to all scheduling coordinators for load serving entities within an applicable transmission service area. The CAISO has established a similar cost allocation approach for Capacity Procurement Mechanism Significant Event designations under section 43.8.5 of its tariff. This argument does not account for the fact that the CAISO procures Significant Event CPM capacity only *after* the occurrence of a significant event. In the case of incremental black start capability, the CAISO is incurring costs *prior to* the occurrence of a reliability event based on a deficiency identified after reviewing a participating transmission owner's system restoration plan. The fact that the participating transmission owner can secure more capability through its own system restoration planning efforts supports a mechanism that allocates the cost of incremental black start needs the CAISO identifies to the participating transmission owner in whose service area the black start generator(s) is located and not to load serving entities.¹⁸ This approach is also consistent with black start cost allocation approaches the Commission has accepted in other organized markets.¹⁹

IV. Stakeholder Process

The CAISO conducted a stakeholder process to examine the appropriate method for allocating the costs of incremental black start capability and describing the process it would undertake to procure black start capability under its existing tariff authority to contract for black start. With the sole exception noted above, stakeholders generally support allocating black start capability costs as reliability service costs to participating transmission owners. During discussions concerning tariff changes needed to implement this initiative, the CAISO received two rounds of comments from stakeholders. Many of these

¹⁸ Moreover, the CAISO has not configured current settlement charge codes to allocate black start costs in this manner. Implementing this type of a cost allocation methodology would require, among other steps, settlement software modifications, a product release plan, and market simulation testing. This potentially could add delay and complexity to the procurement of the incremental black start resources required in the Greater San Francisco Bay Area.

¹⁹ See *e.g. PJM Interconnection, L.L.C.* 144 FERC ¶ 61,191 (2013), accepting changes to PJM's tariff to allocate the costs for black start capability of generation units designated by PJM to network service customers and point-to-point reservations in the receiving transmission owner's zone. PJM's revisions also allocated annual revenues for black start units that are shared and designated to serve multiple zones based on the amount of critical load they serve in each transmission zone.

comments have helped improve the clarity of the tariff revisions submitted in this filing, but stakeholders did raise several concerns.

A. The CAISO has existing tariff authority to contract for black start capability.

As referenced above, the CAISO has existing tariff authority to contract for black start.²⁰ During the CAISO's development of tariff language, one stakeholder requested that the CAISO include in its tariff language explaining the steps of the process it is undertaking to procure incremental black start capability. As part of its approach to procure black start capability, the CAISO plans to use a competitive solicitation process to ensure it obtains a technically and commercially feasible solution as well as to promote transparency.²¹ The CAISO Board of Governors approved using a competitive solicitation process for selecting black start resources to meet incremental needs in the Greater San Francisco Bay Area but did not direct that the CAISO modify its existing tariff authority to contract for black start capability.

The CAISO anticipates the process of entering into contracts for black start capability will occur very infrequently and does not believe that incorporating the elements of its solicitation process into the tariff is necessary. Further, the CAISO has undertaken procurement solicitations in the past without being required to specify the steps and details of the solicitation in its tariff.²² The CAISO has published technical specifications for the solicitation and issued a questionnaire for bidders. All of this information is available on the CAISO's website.²³ The CAISO also held a workshop on May 24, 2017 with prospective bidders to discuss the technical, commercial and contractual requirements for incremental black start resources.²⁴ Through these steps, the

²⁰ CAISO tariff section 8.3.1.

²¹ See Memorandum to CAISO Board Governors from Keith Casey dated April 24, 2017, Decision on black start and system restoration proposal at 2-3.

http://www.caiso.com/Documents/Decision_BlackStart_SystemRestorationProposal-Memo-May2017.pdf

²² For example, section 42 of the CAISO tariff contemplates that the CAISO might undertake competitive solicitations to procure products to meet reliability needs, and that section does not set forth the steps that any competitive solicitation must follow.

²³ See the CAISO's stakeholder initiative page relating to Black Start and System Restoration at the following link:
http://www.caiso.com/informed/Pages/StakeholderProcesses/Blackstart_SystemRestorationPhase2.aspx

²⁴ See May 8, 2017 CAISO market notice scheduling workshop:
<http://www.caiso.com/Documents/BlackStart-SystemRestorationPhase2TechnicalWorkshop052417.html>

CAISO is working to meet its objective of obtaining a technical and commercially feasible solution as well as maintaining full transparency of its contracting process.

Once it has evaluated any bids, the CAISO will select a resource or resources to provide black start and then will negotiate a black start agreement with the resource's owner and the applicable participating transmission owner to provide this capability. The Commission will have exclusive jurisdiction over this agreement and, similar to a reliability must run agreement, the seller will need to file any such agreement with the Commission, reflecting cost of service rates.²⁵ The Commission's review of any agreement under section 205 of the FPA will ensure that any rates charged under such an agreement are just and reasonable. Thus, the details of any agreement will be transparent.

The suggestion that the CAISO incorporate additional details regarding its existing authority to contract for black start is beyond the scope of the CAISO's tariff filing. Under Section 205 of the FPA, the CAISO has the right to propose changes to its tariff.²⁶ Stakeholders have not explained how the cost allocation the CAISO has proposed requires the CAISO to provide additional details regarding its contracting authority for black start. In the past, the CAISO has used competitive solicitation processes to procure local capacity based on its authority to contract for this capacity without including the details of the complete solicitation process in the CAISO's tariff.²⁷ If affected stakeholders believe the CAISO is not exercising its existing tariff authority to contract for black start capability in a prudent manner or consistent with good utility practice, they may pursue an action under section 206 of the FPA.

B. The CAISO is proposing to eliminate back start payment rescission rules.

As part of its tariff revisions in this filing, the CAISO proposes to remove language that would provide for repayment of reservation payments made to a black start generator if it does not pass a performance test.²⁸ One stakeholder raised a concern about whether these payment rescission rules should continue to apply to black start generating units. These rules do not have any force and effect for current black start generators because such resources provide black

²⁵ 16 U.S. Code § 824d(c).

²⁶ *Atlantic City Electric Co. v. FERC*, 295 F.3d 1, 10 (D.C. Cir. 2002).

²⁷ See generally CASIO presentation made to the California Energy Commission on Existing Reliability Must Run Process, Criteria and Methodology dated June 9, 2004: http://www.energy.ca.gov/2003publications/2004_policy_update/documents/2004-06-09_workshop/2004-06-09_CAISO_RMR.PDF

²⁸ See proposed deletion of CAISO tariff sections 8.2.3.4.2(e), 8.9.5 and 8.9.13.

start capability under agreements with zero price terms, *i.e.* there is no reservation payment to rescind.

The CAISO believes that requiring a black start generator to surrender payments made under a black start agreement for capital and operating expenses on a cost of service basis would create too much commercial risk to justify a resource offering black start capability. A resource might not pass a performance test for any number of reasons. Under such a scenario, the black start generator could lose a substantial portion of its payments for fixed costs under a black start agreement even though it is capable of providing black start for the overwhelming majority of operating hours under the agreement. Including tariff language that would rescind payments under a black start agreement for failure to pass a performance test would likely discourage resource owners from providing black start capability at all.

As part of any black start agreement, the CAISO does not plan to make capability payments to a black start generating unit until the resource has passed a performance test to provide black start service. The Commission will have exclusive authority to review the terms and conditions of such an agreement. This will ensure transmission customers do not face charges for incremental black start capability until the resource demonstrates it can provide the service.

C. The CAISO and Black Start Generators must adhere to the requirements of NERC Reliability Standards.

In light of the proposed elimination of payment rescission rules, one stakeholder recommended that the CAISO annually test black start generators that receive capability payments from the CAISO under a black start agreement to validate that they continue to meet applicable performance requirements. The CAISO does not believe it is necessary to incorporate an annual testing requirement into its tariff. Currently, NERC Reliability Standard EOP-005-2 requires that transmission operators conduct tests of black start resources at least once every three years.²⁹ The Commission already endorsed the frequency of this testing requirement when it approved NERC Reliability Standard EOP-005-02. The CAISO's current tariff provides that black start generating units must pass performance tests for demonstrating black start capability, which the CAISO may periodically undertake in accordance with the

²⁹ See NERC Reliability Standard EOP-005-02, Requirement 15, which states:

Each Generator Operator with a Blackstart Resource shall notify its Transmission Operator of any known changes to the capabilities of that Blackstart Resource affecting the ability to meet the Transmission Operator's restoration plan within 24 hours following such change.

CAISO's operating procedures for black start testing.³⁰ These provisions allow the CAISO to conduct testing more frequently than once every three years, if necessary, to ensure reliability. If a resource does not pass a performance test, the CAISO expects the resource to remedy any issue and complete another performance test immediately. If the resource cannot remedy the issue, this will be grounds for the CAISO to terminate the black start agreement without further payment. In a sample black start agreement posted on its website, the CAISO has proposed that if the CAISO and participating transmission owner terminate the agreement for default (including the inability of a black start generating unit to pass a performance test), the black start generator will not have the right to seek recovery of any unamortized costs.

There are additional reasons the CAISO does not believe it is necessary to impose a tariff requirement for annual performance testing of black start generating units. Each generator operator with a black start generating unit must notify its transmission operator of any known changes to the capabilities of that black start generating unit affecting the ability to meet the transmission operator's restoration plan within 24 hours following such change.³¹ Black start generators must also maintain records of performance tests demonstrating that its generating unit can perform as specified in the restoration plan.³² These requirements, which apply to black start generators under NERC Reliability Standard EOP-005-2, should mitigate the risk that a black start generating unit may not perform during a test or fail to perform during a black start event. The CAISO is proposing to incorporate these requirements into its tariff by requiring that black start generating units adhere to applicable reliability criteria.³³ In addition, under the CAISO's existing tariff, the CAISO can directly allocate a reliability standards penalty assessed against the CAISO to a black start generating unit if its conduct contributed, in whole or in part, to the violation(s) at issue.³⁴

D. The CAISO's does not support self-provision of black start by metered subsystem operators.

As part of its proposed tariff revisions, the CAISO proposes to remove language regarding the ability of metered subsystem operators to self-provide black start in order to avoid payment for black start capability under the CAISO's

³⁰ CAISO tariff section 8.2.3.4.2 (b).

³¹ See EOP-005-02, Requirement 15.

³² See EOP-005-02, Requirement 16.

³³ See proposed addition to Appendix D of the CASIO tariff, section (i).

³⁴ CAISO tariff section 14.7

tariff.³⁵ One stakeholder asked whether scheduling coordinators may still self-provide black start. Under NERC Reliability Standard EOP-005-2, the CAISO incorporates any black start generators that it relies upon into its system restoration plan. There is no ability to self-provide this capability similar to ancillary services such as regulation, spinning reserve, and non-spinning reserve. Instead, the CAISO enters into agreements for black start capability that it incorporates into its system restoration plan. A metered subsystem operator can offer to provide a black start generating unit to the CAISO. If the CAISO incorporates that unit into its system restoration plan, the CAISO will compensate the participating generator for black start capability pursuant to the terms of the black start agreement approved by the Commission. If, instead, such an agreement has a zero price term that will reduce the overall costs of black start capability that the CAISO will allocate to a participating transmission owner as a reliability services cost.

E. The CAISO is not proposing to modify its rules relating to settlement of black start service provided resulting from an exceptional dispatch.

In this filing, the CAISO is not proposing to modify how it settles black start service when it issues an exceptional dispatch to a black start generator. Under the CAISO's current tariff, the CAISO settles this energy as real-time dispatch instructed imbalance energy.³⁶ The CAISO allocates this payment to scheduling coordinators with measured demand, excluding exports to neighboring Balancing Authority Areas. One stakeholder asked if this payment allocation is consistent with the cost causation approach the CAISO proposes regarding the allocation of costs of black start capability under black start agreements. Not only is this issue beyond the scope of the tariff revisions the CAISO is making, the CAISO believes this existing element of the tariff remains just and reasonable. Only scheduling coordinators' measured demand on the system at the time a black start generator provides black start service will pay for this real-time instructed imbalance energy. Measured demand will be consuming energy at the time of a real-time dispatch of a black start generating unit and it is appropriate to allocate the costs of that energy to this demand. This methodology excludes exports because in a black start event, the CAISO anticipates that it will not support exports of energy to other balancing authority areas until it has stabilized the system and returned load to service.

³⁵ See proposed deletion of CAISO tariff section 4.9.4.5.

³⁶ See, CAISO tariff section 11.5.6.5.

F. The CAISO's proposed tariff provisions help clarify black start requirements and cost allocation rules.

As referenced above, the CAISO proposes to restructure and clarify tariff requirements applicable to black start. During the stakeholder tariff development process, several stakeholders recommended changes to further this effort, including removing terms pertaining to black start from tariff provisions relating to ancillary services such as regulation, spinning reserve, and non-spinning reserve. The CAISO has incorporated many of these suggested changes into this tariff amendment filing. Among other changes, the CAISO has consolidated black start requirements into section 5 of the tariff, a section that was previously not used. In addition, the CAISO has incorporated settlement and cost allocation rules into a new subsection 11.4 that was previously not used. These revisions should enhance the ability of affected stakeholders to find and understand the CAISO's black start tariff provisions.

V. Effective Date

The CAISO requests that the Commission make the tariff revisions contained in this filing effective November 1, 2017. This effective date will provide sufficient time for the CAISO to work with participating transmission owners and prospective providers of black start capability to ensure their business processes are in place to administer any cost allocation of an invoice for black start capability under a black start agreement. This effective date will also permit the CAISO to complete any necessary changes to the CAISO's business rules to process invoices for black start capability under a black start agreement. Based on the timelines associated with the CAISO's solicitation process for additional black start capability to support the Greater San Francisco Bay Area, the CAISO does not anticipate that it will enter into any agreements for incremental black start capability until 2018. The CAISO requests that the Commission grant any waivers necessary to approve the revised tariff language effective November 1, 2017.

VI. Communications

Pursuant to Rule 203(b) of the Commission's Rules and Practice³⁷ and Procedure, the CAISO requests that all communications regarding this filing be directed to the following individuals, whose names should appear on the official service list established by the Commission with respect to this submittal:

Anthony Ivancovich
Deputy General Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7135
Fax: (916) 608-7222
aivancovich@caiso.com

Andrew Ulmer
Director, Federal Regulatory Affairs
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7209
Fax: (916) 608-7222
aulmer@caiso.com

VII. Service

The CAISO has served copies of this transmittal letter, and all attachments, on the California Public Utilities Commission, the California Energy Commission, and all parties with effective scheduling coordinator service agreements under the CAISO tariff. In addition, the CAISO is posting this transmittal letter and all attachments on its public website.

VIII. Attachments

The following attachments, in addition to this transmittal letter, support the instant filing:

Attachment A	Matrix of tariff revisions with justifications
Attachment B	May 2017 Board of Governors' Materials
Attachment C	Revised CAISO tariff that incorporates the proposed changes described above
Attachment D	The proposed changes to the CAISO tariff shown in red-line format

³⁷ See 18 C.F.R. § 203(b).

IX. Conclusion

The CAISO requests that the Commission accept the proposed tariff revisions without modification. These amendments will advance reliable operation of the grid and ensure that the CAISO can fairly allocate the costs of incremental black start capability it needs to procure to enhance restoration times in the Greater San Francisco Bay Area following a black start event.

Please contact the undersigned if you have any questions regarding this matter.

Dated: August 3, 2017

Respectfully submitted,

By: Andrew Ulmer

Roger E. Collanton
General Counsel
Anthony Ivancovich
Deputy General Counsel
Andrew Ulmer
Director, Federal Regulatory Affairs
The California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7209
Fax: (916) 608-7222
aulmer@caiso.com

Attachment A – Matrix of Tariff Revisions with Justifications

Black Start and System Restoration

California Independent System Operator Corporation

Tariff Section	Revision	Rationale
<p>Section 4.9.4.4 – adding the word “and”, and striking all of 4.9.4.5 and replacing it with “Not Used.”</p>	<p>4.9.4.4 be responsible for any Reliability Must-Run Generation and Voltage Support required for reliability of the MSS, including the responsibility for any costs of such Reliability Must-Run Generation, and Voltage Support and may satisfy this requirement through Generating Units owned by the MSS Operator or under contract to the MSS Operator; and 4.9.4.5 [Not Used] be responsible for Black Start requirements for reliability of the MSS, however, if the MSS Operator can self-provide this requirement, the MSS Operator shall not pay its pro-rata share of the Black Start requirement in accordance with Section 11; and</p>	<p>The language in section 4.9.4.5 currently has no application. The CAISO does not run an auction process to secure black start capability or dispatch black start resources. There is no opportunity for metered sub system operators to self-provide black start in order to avoid an allocation of black start costs.</p>
<p>Section 5 and Section 5.1</p>	<p>5. Black Start and System Restoration [Not Used] 5.1 Black Start Capability The CAISO shall determine the amount and location of Black Start Generation it requires through a system restoration plan that meets the requirements of Applicable Reliability Criteria. In making this determination, the CAISO shall consult with Participating Transmission Owners. Participating Transmission Owners with their own system restoration plans that include transmission lines and associated facilities that are part of the CAISO Controlled Grid shall upon the request of the CAISO provide the CAISO with these system restoration plans. The CAISO shall consider Participating Transmission Owners’ system restoration plans in developing a system restoration plan for the CAISO Balancing Authority Area and may identify Black Start Generation needs for the CAISO Balancing Authority Area not identified in Participating Transmission Owners’ system restoration plans. Scheduling Coordinators shall notify the CAISO of their Load restoration time requirements for any Loads that provide emergency services. This</p>	<p>The CAISO proposes to move existing language in section 8.2.3.4 to a new section 5.1 as part of its efforts to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p>

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	<p>notice shall include the MW amount of Load, required restoration time, and associated Node on the CAISO Controlled Grid. For purposes of preparing system restoration plans, the CAISO shall consult with applicable Participating Transmission Owners concerning any Load restoration information provided by Scheduling Coordinators.</p>	
Section 5.2	<p>5.2 Black Start Units The CAISO shall contract annually (or for such other period as the CAISO may determine is economically advantageous) for Black Start services. The CAISO will select Black Start Generating Units in locations where adequate transmission capacity can be made readily available (assuming no transmission damage) to connect the Black Start Generating Unit to energize the station service bus or dead transmission bus of a Generating Unit designated by the CAISO. Black Start Generating Units:</p> <ul style="list-style-type: none"> (a) must be located in the CAISO Balancing Authority Area; (b) may be located anywhere in the CAISO Balancing Authority Area provided that the Black Start Generating Unit is capable of meeting the CAISO performance requirements for starting and interconnecting to the CAISO Controlled Grid; but (c) must be dispersed throughout the CAISO Balancing Authority Area. 	<p>The CAISO proposes to move existing language in sections 8.3.1 and 8.3.5 that provides the CAISO the authority to contract for black start to a new section 5.2 as part of its efforts to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes. In the first sentence of proposed section 5.2, the CAISO has modified the form of language in current sections 8.3.1 and 8.3.5, which authorize the CAISO to contract for black start capability from generating units that have black start capability. The modifications do not change the authority for the CAISO to contract for this capability.</p>
Section 5.3	<p>5.3 Black Start Services</p> <ul style="list-style-type: none"> (a) All Participating Generators with Black Start Generating Units must satisfy technical requirements specified in Appendix D of the CAISO Tariff and the Participating Generators' Black Start Agreement in relation to the Black Start Generating Units. (b) The CAISO shall from time to time undertake performance 	<p>The CAISO proposes to move existing language from tariff section 8.2.3.4.2 to a new section 5.3 as part of its efforts to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p> <p>The CAISO has modified language in current section 8.2.3.4.2(e) that states if a black start generating unit fails a performance test administered by the</p>

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	<p>tests, with or without prior notification.</p> <p>(c) The CAISO shall have the sole right to determine when the operation of Black Start Generating Units is required to respond to conditions on the CAISO Controlled Grid.</p> <p>(d) If the CAISO has suspended in the market for Energy and/or Ancillary Services pursuant to Section 7.7.34, the price paid by the CAISO for Black Start services shall be sufficient to permit the relevant Participating Generator to recover its costs over the period that it is directed to operate by the CAISO.</p> <p>(e) If a Black Start Generating Unit fails to achieve a Black Start when called upon by the CAISO, or fails to pass a performance test administered by the CAISO, the Market Participant that has contracted to supply Black Start service from the Generating Unit shall be subject to remedies or penalties as specified in its Black Start Agreement.</p> <p>(f) The CAISO will dispatch Black Start Generating Units as required in accordance with the applicable Black Start Agreement.</p>	<p>CAISO, the market participant that has contracted to supply black start service from the generating unit must re-pay to the CAISO any reserve payment(s) that it has received since the administration of the last performance test or the last occasion upon which it successfully achieved a black start when called upon by the CAISO, whichever is the shorter period. Proposed section 5.3(e) now states that when a black start generating unit has failed a performance test, the market participant that has contracted to supply black start service from the generating unit shall be subject to remedies and penalties as specified in its black start agreement.</p> <p>For current black start generating units, the language in tariff section 8.2.3.4.2(e) has no application because these resources provide black start capability under agreements with zero price terms, <i>i.e.</i> there is no capability payment to re-pay to the CAISO. The CAISO believes that requiring a black start generating unit to surrender payments made under a black start agreement for capital and operating expenses on a cost of service basis would create too much commercial risk to justify a resource offering black start capability. Under such a mechanism, the black start generator could lose a substantial portion of its payments under a black start agreement even though it may have the capability to provide black start for the overwhelming majority of operating hours under the agreement. Inclusion of tariff language that would rescind payments under a black start agreement for failure to pass a performance test would likely discourage resource owners from providing black start capability.</p> <p>Importantly, as part of any black start agreement for incremental black start capability, the CAISO does not plan to make capability payments to a black start generating unit until the resource has passed a performance test to provide black start service. Moreover, the CAISO's current tariff provides that black start generating units must pass performance tests to demonstrate their black start capability, which the CAISO may periodically undertake in accordance with</p>

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		<p>the CAISO's operating procedures for black start testing. In the event a black start generating unit does not pass performance testing, the CAISO expects the black start generating unit to remedy any issue and complete another performance test immediately. If the black start generating unit cannot remedy the issue, this will be grounds for termination of the black start agreement without further payment. Moreover, under NERC Reliability Standard EOP-005-02, Requirement 15 states that each Generator Operator with a black start generating unit must notify its transmission operator of any known changes to the capabilities of that black start generating unit affecting the ability to meet the transmission operator's restoration plan within 24 hours following such change. This requirement applicable to black start generating units under EOP-005-2 should mitigate the risk that a black start generating unit may not perform during a test or fail to perform during a black start event. In addition, under the CAISO's existing tariff, a black start generating unit that does not perform when dispatched for black start could face a direct allocation of a reliability standards penalty assessed against the CAISO in the event its conduct contributed, in whole, or in part, to the violation(s) at issue. (See existing section 14.7.)</p>
<p>Section 8.1, second paragraph</p>	<p>8.1 Scope The CAISO shall be responsible for ensuring that there are sufficient Ancillary Services available to maintain the reliability of the CAISO Controlled Grid consistent with NERC and WECC reliability standards and any requirements of the NRC. The CAISO's Ancillary Services requirements may be self-provided by Scheduling Coordinators as further provided in the Business Practice Manuals. Those Ancillary Services which the CAISO requires to be available but which are not being self-provided will be competitively procured by the CAISO from Scheduling Coordinators in the Day-Ahead and Real-Time Markets consistent with Section 8.3. The</p>	<p>The CAISO proposes to remove language referencing black start from section 8.1 as part of its efforts to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes. The current language in section 8.1 may create unnecessary confusion regarding this fact.</p> <p>The CAISO also does not procure voltage support as an ancillary service through its day-ahead and real-time market processes. However, stakeholders did not support making a similar change regarding voltage support in the context of this tariff amendment filing. The CAISO will endeavor to address this matter in a separate tariff clarification filing.</p>

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	<p>provision of Ancillary Services from the Interties with interconnected Balancing Authority Areas is limited to Ancillary Services bid into the competitive procurement processes in the IFM and RTM. The CAISO will not accept Submissions to Self-Provide Ancillary Services that are imports to the CAISO Balancing Authority Area over the Interties with interconnected Balancing Authority Areas, except from Dynamic System Resources certified to provide Ancillary Services or if provided pursuant to ETCs, TORs or Converted Rights. The CAISO will accept Submissions to Self-Provide Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area if they are certified to provide Ancillary Services. The CAISO will calculate payments for Ancillary Services supplied by Scheduling Coordinators and charge the cost of Ancillary Services to Scheduling Coordinators based on their Ancillary Service Obligations.</p> <p>For purposes of this CAISO Tariff, Ancillary Services are: (i) Regulation Up and Regulation Down; (ii) Spinning Reserve; and (iii) Non-Spinning Reserve; and (iv) Voltage Support, (iv) Voltage Support, and (v) Black Start capability.</p> <p>These services will be procured as stated in Section 8.3.5. Bids for these services may be submitted by a Scheduling Coordinator for resources that are capable of providing the specific service and that meet applicable Ancillary Service standards and technical requirements, as set forth in Sections 8.1 through 8.4, and are certified by the CAISO to provide Ancillary Services. Identification of specific services in this CAISO Tariff shall not preclude development of additional interconnected operation services over time. The CAISO and Market Participants will seek to develop additional categories of these unbundled services over time</p>	

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	as the operation of the CAISO Controlled Grid matures or as required by regulatory authorities.	
Section 8.2.3.4, being marked as "Not Used" and moved to proposed Section 5.1	<p>8.2.3.4 [Not Used] Black Start Capability The CAISO shall determine the amount and location of Black Start Generation it requires through a system restoration plan that meets the requirements of Applicable Reliability Criteria. In making this determination, the CAISO shall consult with Participating Transmission Owners. Participating Transmission Owners with their own system restoration plans that include transmission lines and associated facilities that are part of the CAISO Controlled Grid shall upon the request of the CAISO provide the CAISO with these system restoration plans. The CAISO shall consider Participating Transmission Owners' system restoration plans in developing a system restoration plan for the CAISO system and may identify Black Start Generation needs for the CAISO system not identified in Participating Transmission Owners' system restoration plans. Scheduling Coordinators shall notify the CAISO of their Load restoration time requirements for any Loads that provide emergency services. This notice shall include the MW amount of Load, required restoration time, and associated Node on the CAISO Controlled Grid. For purposes of preparing system restoration plans, the CAISO shall consult with applicable Participating Transmission Owners concerning any Load restoration information provided by Scheduling Coordinators.</p> <p>8.2.3.4.1 Black Start Units The CAISO will select Black Start capacity in locations where adequate transmission capacity can be made readily available (assuming no transmission damage) to connect the Black Start Generating Unit to the station service bus of a Generating</p>	<p>The CAISO has incorporated the language in section 8.2.3.4 into new section 5.1. The CAISO proposes to move this language to a new section as part of its efforts to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p> <p>The CAISO has modified language in current section 8.2.3.4.2(e) that states if a black start generating unit fails a performance test administered by the CAISO, the market participant that has contracted to supply black start service from the generating unit must re-pay to the CAISO any reserve payment(s) that it has received since the administration of the last performance test or the last occasion upon which it successfully achieved a black start when called upon by the CAISO, whichever is the shorter period. Proposed section 5.3(e) now states that when a black start generating unit has failed a performance test, the market participant that has contracted to supply black start service from the generating unit shall be subject to remedies and penalties as specified in its black start agreement. Please see rationale for proposed section 5.3, <i>supra</i>.</p>

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	<p>Unit designated by the CAISO.</p> <p>Black Start Generating Units:</p> <p>(a) must be located in the CAISO Balancing Authority Area;</p> <p>(b) may be located anywhere in the CAISO Balancing Authority Area provided that the Black Start resource is capable of meeting the CAISO performance requirements for starting and interconnection to the CAISO Controlled Grid; but</p> <p>(c) must be dispersed throughout the CAISO Balancing Authority Area.</p> <p>8.2.3.4.2 Black Start Services</p> <p>(a) All Participating Generators with Black Start Generating Units must satisfy technical requirements specified by the CAISO.</p> <p>(b) The CAISO shall from time to time undertake performance tests, with or without prior notification.</p> <p>(c) The CAISO shall have the sole right to determine when the operation of Black Start Generating Units is required to respond to conditions on the CAISO Controlled Grid.</p> <p>(d) If the CAISO has intervened in the market for Energy and/or Ancillary Services pursuant to Section 7.7.4, the price paid by the CAISO for Black Start services shall be sufficient to permit the relevant Participating Generator to recover its costs over the period that it is directed to operate by the CAISO.</p> <p>(e) If a Black Start Generating Unit fails to achieve a Black Start when called upon by the CAISO, or fails to pass a performance test administered by the CAISO, the Market Participant that has contracted to supply Black Start service from the Generating Unit shall re-pay to the CAISO any reserve payment(s) that it has received since the</p>	

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	<p>administration of the last performance test or the last occasion upon which it successfully achieved a Black Start when called upon by the CAISO, whichever is the shorter period.</p>	
<p>Section 8.3.1, last paragraph</p>	<p>The CAISO will contract for long-term Voltage Support service with owners of Reliability Must-Run Units under Reliability Must-Run Contracts. The CAISO will procure Black Start capability through individual contracts with Scheduling Coordinators for Reliability Must-Run Units and other Generating Units that have Black Start capability. These requirements and standards apply to all Ancillary Services whether self-provided or procured by the CAISO.</p>	<p>The CAISO proposes to move language in existing tariff sections 8.3.1 and 8.3.5 that provides the CAISO with the authority to contract for black start to a to a new section 5.2 as part of its efforts to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes. In the first sentence of proposed section 5.2, the CAISO has modified the form of language in current sections 8.3.1 and 8.3.5, which authorize the CAISO to contract for black start capability from generating units that have black start capability. The modifications do not change the authority of the CAISO to contract for this capability.</p>
<p>Section 8.3.4</p>	<p>8.3.4 Certification and Testing Requirements The owner of and Scheduling Coordinator for each resource for which a Bid to provide Ancillary Services or Submission to Self-Provide Ancillary Services is allowed under the CAISO Tariff, and all other System Resources that are allowed to submit a Bid to provide Ancillary Services under this CAISO Tariff, must comply with the CAISO's certification and testing requirements as contained in Appendix K and the CAISO's Operating Procedures. Each resource used to bid Regulation or used to self-provide Regulation must have been certified and tested by the CAISO using the process defined in Part A of Appendix K. Each Dynamic System Resource offering Regulation must comply with the Dynamic Scheduling Protocol in Appendix M. Spinning Reserve may be provided only from resources that have been certified and tested by the CAISO using the process defined in Part B of</p>	<p>The CAISO is proposing to delete the language in Part E of Appendix K to the CAISO tariff because it currently has no force and effect. The CAISO does not certify resources to provide black start capability using this certification process but instead conducts performance tests of black start generating units in its system restoration plan consistent with NERC Reliability Standard EOP-005-02 and CAISO operating procedures.</p>

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	<p>Appendix K. Non-Spinning Reserve may be provided from resources that have been certified and tested by the CAISO using the process defined in Part C of Appendix K. Black Start capability may only be provided from Generating Units that have been certified and tested by the CAISO using the process defined in Part E of Appendix K. CAISO certification to provide Ancillary Services may be revoked by the CAISO under the provisions of this CAISO Tariff, including Appendix K.</p>	
Section 8.3.5	<p>8.3.5 Daily and Hourly Procurement The CAISO shall procure Regulation Up, Regulation Down, Spinning Reserve, and Non-Spinning Reserve on a daily and Real-Time basis in the IFM and RTM, respectively. The CAISO shall procure Ancillary Services on a longer-term basis pursuant to Section 42.1.3 if necessary to meet Reliability Criteria. The CAISO shall contract for Voltage Support annually (or for such other period as the CAISO may determine is economically advantageous) and on a daily or hourly basis as required to maintain System Reliability. The CAISO shall contract annually (or for such other period as the CAISO may determine is economically advantageous) for Black Start Generation.</p>	<p>The CAISO proposes to move language in existing sections 8.3.1 and 8.3.5 that provides the CAISO with the authority to contract for black start to a to a new section 5.2 as part of its efforts to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes. In the first sentence of proposed section 5.2, the CAISO has modified the form of language in current sections 8.3.1 and 8.3.5, which authorize the CAISO to contract for black start capability from generating units that have black start capability. The modifications do not change the authority of the CAISO to contract for this capability.</p>
Section 8.4.2, subsections (b) to (d)	<p>(b) Spinning Reserve and Non-Spinning Reserve. Each provider of Spinning Reserve or Non-Spinning Reserve must be capable of receiving a Dispatch Instruction within one (1) minute from the time the CAISO Control Center elects to Dispatch the Spinning Reserve resource or Non-Spinning Reserve resource and must ensure that its resource can be at the Dispatched operating level within ten (10) minutes after issuance of the Dispatch Instruction; and</p> <p>(c) Voltage Support. Generating Units providing Voltage Support</p>	<p>The CAISO proposes to move language from section 8.4.2(d) relating to communication requirements of black start generating units to Appendix D of the CAISO tariff, which enumerates requirements for black start generating units. This change is part of the CAISO's effort to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p> <p>The CAISO also does not procure voltage support as ancillary services through its day-ahead and real-time market processes. However, stakeholders did not support making similar changes regarding voltage</p>

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	<p>must have automatic voltage regulators which can correct the bus voltages to be within the prescribed Voltage Limits and within the machine capability in less than one (1) minute.; and</p> <p>(d) Black Start. (i) Voice Communications: each supplier of Black Start capability must ensure that normal and emergency voice communications are available to permit effective Dispatch of the Black Start capability; (ii) CAISO Confirmation: No Load served by the Black Start Generating Unit or by any designated Generating Unit or by any transmission facility used for Black Start service may be restored until the CAISO has confirmed that the need for such service has passed.</p>	<p>support in the context of this tariff amendment filing. The CAISO will endeavor to address this matter in a separate tariff clarification filing.</p>
<p>Section 8.4.3</p>	<p>8.4.3 Ancillary Service Capability Standards</p> <p>The providers of Ancillary Services under this CAISO Tariff must comply with the following capability standards for :(a) Spinning Reserve and Non-Spinning Reserve Capability. Each resource or external import of a System Resource scheduled to provide Spinning Reserve and each resource providing Non-Spinning Reserve must be capable of converting the full capacity reserved to Energy production within ten (10) minutes after the issue of the Dispatch Instruction by the CAISO. Each resource scheduled to provide Spinning Reserve and each resource scheduled to provide Non-Spinning Reserve must be capable of maintaining that output or scheduled Interchange for at least thirty (30) minutes from the point at which the resources reaches its award capacity.</p> <p>(b) Black Start. Each Black Start Generating Unit must be able to start up with a dead primary and station service bus within ten</p>	<p>The CAISO proposes to move language from section 8.4.3 relating to requirements of black start generating units to Appendix D of the CAISO tariff which enumerates requirements for black start generating units. This change is part of the CAISO's effort to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p>

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	<p>(10) minutes of issue of a Dispatch Instruction by the CAISO requiring a Black Start. Each Black Start Generating Unit must provide sufficient reactive capability to keep the energized transmission bus voltages within emergency Voltage Limits over the range of no load to full load. Each Black Start Generating Unit must be capable of sustaining its output for a minimum period of twelve (12) hours from the time when it first starts delivering Energy.</p>	
8.4.6.1	<p>8.4.6.1 [Not Used] Additional Requirements for Black Start Units A Participating Generator who wishes to offer Black Start must ensure that the requirements set out in Appendix D are met in relation to the Generating Units.</p>	<p>The CAISO is deleting this section because it duplicates language in new section 5.3(a) that requires participating generators with black start generating units to satisfy the requirements specific in Appendix D of the CAISO tariff. By removing this language from section 8 of the tariff, this change also helps clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p>
All of Section 8.8	<p>8.8 [Not Used] Black Start (a) Black Start shall meet the standards specified for Black Start in this CAISO Tariff and Appendix K; and (b) The CAISO will dispatch Black Start Generating Units as required in accordance with the applicable Black Start Agreement.</p>	<p>The CAISO is proposing to delete the language in Section 8.8(a) that refers to Appendix K to the CAISO tariff because it currently has no application. The CAISO does not certify resources to provide black start capability using this certification process but instead conducts performance tests of black start resources in its system restoration plan consistent with NERC Reliability Standard EOP-005-02 and CAISO operating procedures. The CAISO has moved language from section 8.8(b) to new section 5.3. By removing this language from section 8 of the tariff, this change helps clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p>
Section 8.9.5	<p>8.9.5 [Not Used] Compliance Testing for Black Start The CAISO may test the Black Start capability of a Generating Unit by unannounced tests, which may include issuing Dispatch Instructions to start and synchronize the</p>	<p>The CAISO proposes to delete tariff section 8.9.5 in part to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p> <p>The CAISO has existing tariff authority to conduct performance tests of black start</p>

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	resource, testing of all communications circuits, simulating switching needed to connect the Black Start Generating Unit to the transmission system, and testing the features unique to each facility that relate to Black Start service.	<p>generating units. See CAISO tariff section 8.2.3.4.2(b), which states: "The CAISO shall from time to time undertake performance tests, with or without prior notification." Note: The CAISO is proposing to move this language to new proposed section 5.3. The CAISO's operating procedures describe the elements of performance testing for black start generating units. See CAISO Operating Procedure 5360. http://www.caiso.com/Documents/5360.pdf</p>
Section 8.9.13	<p>8.9.13 [Not Used] Performance Audit for Black Start The CAISO will audit the performance of a Black Start Generating Unit by analysis of Meter Data and other records to determine that the performance criteria relating to the Black Start from that Black Start Generating Unit were met when required.</p>	<p>The CAISO proposes to delete section 8.9.13 in part to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p> <p>The CAISO has existing authority to conduct performance tests of black start generating units. See CAISO tariff section 8.2.3.4.2(b), which states: "The CAISO shall from time to time undertake performance tests, with or without prior notification." Note: the CAISO is proposing to move this language to new proposed section 5.3. The CAISO's operating procedures describe the elements of performance testing for black start generating units. See CAISO Operating Procedure 5360. http://www.caiso.com/Documents/5360.pdf</p>
Section 8.10.5	<p>8.10.5 [Not Used] Black Start The CAISO may test the Black Start capability of a Generating Unit by issuing unannounced Dispatch Instructions requiring the Generating Unit to start on a Black Start basis. The CAISO shall measure the response of the Generating Unit to determine compliance with the terms of the Black Start contract. The Scheduling Coordinator or Black Start Generator as stated in Section 11.10.1.5 for the Generating Unit shall be paid the Generating Unit's contract price for the output under the Black Start test.</p>	<p>The CAISO proposes to delete section 8.9.13 in part to clarify that black start capability is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p> <p>In addition, the CAISO's existing authority to conduct performance tests of black start generating units (See CAISO tariff section 8.2.3.4.2(b), which states: "The CAISO shall from time to time undertake performance tests, with or without prior notification." Note: The CAISO is proposing to move this language to new proposed section 5.3. The CAISO's operating procedures describe the elements of performance testing for black start generating units. See CAISO Operating Procedure 5360. http://www.caiso.com/Documents/5360.pdf</p>

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		<p>The CAISO has moved language relating to settlement of energy from black start performance tests to proposed new section 11.4 in order to differentiate black start from other ancillary services the CAISO procures through its day-ahead and real-time market processes.</p>
Section 11.4	<p>11.4 Black Start Settlements [Not Used] The total payments each Scheduling Coordinator for Black Start capability shall consist of any payments under any Black Start Agreements long-term contracts due for the Settlement Period. If the Energy price and Start-Up Costs are not specified in the Black Start Agreement long-term contract, the Black Start Energy will be paid as an Exceptional Dispatch in accordance with Section 11.5.6.1 and the resource will be entitled to Bid Cost Recovery. Black Start Energy resulting from a performance test shall also be paid as an Exceptional Dispatch in accordance with Section 11.5.6.1. RMR Units providing Black Start are compensated in accordance with the RMR Contract rather than this Section 11.4.</p>	<p>The CAISO has proposed to move language relating to settlement of black start from section 11.10 to a new section 11.4 in order to differentiate black start from other ancillary services the CAISO procures through its day-ahead and real-time market processes. The CAISO has also made changes to refer to black start agreements, which is a defined term under the CAISO tariff.</p>
Section 11.4.1	<p>11.4.1 Black Start Energy The Black Start Energy payment user rate for any Settlement Period will be calculated based on the sum of Black Start Energy payments to Scheduling Coordinators paid in accordance with Section 11.10.1.5, including any Exceptional Dispatch Instructed Imbalance Energy payments for Black Start, in the applicable Settlement Period divided by Measured Demand, excluding exports to neighboring Balancing Authority Areas and excluding Demand within an MSS except as provided by Section 4.9.4.5. The Black Start Energy user charge for any Settlement Period for a Scheduling Coordinator will be the Black Start Energy payment user rate multiplied by the quantity of Measured Demand, excluding exports to neighboring Balancing</p>	<p>The CAISO has moved language relating to settlement of black start from section 11.10.1.5 to a new section 11.4.1 in order to differentiate black start from other ancillary series the CAISO procures through its day-ahead and real-time market processes. The CAISO proposes to eliminate language referencing payments made in accordance with Section 11.10.1.5 because the cross-reference is not necessary to the formula for the black start energy payment user rate. The CAISO proposes to eliminate language that references section 4.9.4.5 because this section has no application. There is no opportunity for metered sub system operators to self-provide black start capability in order to avoid an allocation of black start costs. The CAISO is also proposing to delete language in section 4.9.4.5 as part of this filing.</p>

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	<p>Authority Areas and excluding Demand within an MSS except as provided by Section 4.9.4.4, for which that Scheduling Coordinator is responsible in that Settlement Period.</p>	
Section 11.4.2	<p>11.4.2 Black Start Capability The CAISO shall allocate payments for Black Start capability under a Black Start Agreement as Reliability Services Costs to the Participating Transmission Owner in whose Service Area the Black Start Generating Unit is located.</p>	<p>For purposes of any black start capability costs under a black start agreement, the CAISO is proposing to allocate black start costs it incurs in a manner similar to a reliability must run contract. Under this cost allocation approach, the CAISO would invoice the costs of black start capability under a black start agreement to the respective participating transmission owner in whose service area the black start generating unit is located. The CAISO would designate the black start capability costs as a reliability services cost. The participating transmission owner would recover these costs from its transmission customers through its reliability services tariff. This proposed classification of black start capability costs as reliability services costs is consistent with how the CAISO has previously allocated the costs of black start capability under a reliability must run agreement. It is reasonable to use a similar cost allocation approach in this instance because the reliability need identified by the CAISO in the Greater Bay Area that a black start resource will help resolve exists within a participating transmission owner's service area.</p> <p>Under its current tariff, the CAISO develops its system restoration plan in coordination with participating transmission owners who are transmission operators under NERC's functional model. These entities must also develop system restoration plans pursuant to Reliability Standard EOP-005-02. To the extent that these system restoration plans incorporate sufficient black start capability, either from resources already owned or under contract, the CAISO will not need to secure additional black start capability. If the CAISO, however, identifies incremental black start needs associated with one participating transmission owner service area, it would be inequitable to shift costs to meet that need to transmission customers in other participating transmission owner service area. Moreover, if the CAISO</p>

Tariff Section	Revision	Rationale
		needs to procure incremental black start capability to enhance restoration times or for other reasons in a participating transmission owner's service area, allocating the costs of that procurement to the participating transmission owner that benefits is consistent with general cost causation principles.
Section 11.5.6	11.5.6 Settlement Amounts for RTD IIE from Exceptional Dispatch	The CAISO is proposing to modify the heading of section 11.5.6 to refer to RTD IIE, which is the classification of the portion of Imbalance Energy resulting from Dispatch Instructions under the CAISO tariff.
Section 11.5.6.5	11.5.6.5 Settlement of RTD IIE from Black Start Unless otherwise specified in a Black Start Agreement, All RTD IIE Settlement Amounts associated with Black Start receive the Exceptional Dispatch Settlement price as provided in Section 11.5.6.1, but the costs are allocated pursuant to Section 11.440.8.	The CAISO is proposing to modify section 11.5.6.5 to refer to RTD IIE, which is the classification of the portion of Imbalance Energy resulting from Dispatch Instructions under the CAISO tariff. The CAISO is also clarifying that any RTD IIE settlement amounts associated with black start capability will receive the Exceptional Dispatch Settlement price as provided in Section 11.5.6.1, unless otherwise specified in a black start agreement. The CAISO is proposing this language in case there is a need to specify energy payments in a black start agreement. Any such agreement would be subject to the Commission's review under section 205 of the Federal Power Act. At present, the CAISO's black start agreements have zero price terms. The CAISO is working to develop agreements for black start capability to enhance system restoration times in the Greater Bay Area. These contracts will have capability payments. The CAISO expects to continue to allocate RTD IIE payments to scheduling coordinators with measured demand as proposed under sections 11.4 and 11.5.6.1.
Section 11.10.1.5	11.10.1.5 [Not Used] Black Start The total payments for each Scheduling Coordinator for Black Start capability shall consist of any payments under any long-term contracts due for the Settlement Period. If the Energy price and Start-Up Costs are not specified in the long-term contract, the Black Start Energy will be paid as an	The CAISO is proposing to move language in current section 11.10.1.5 to proposed new section 11.4 in order to differentiate black start from other ancillary services the CAISO procures through its day-ahead and real-time market processes.

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	<p>Exceptional Dispatch in accordance with Section 11.5.6.1 and the resource will be entitled to Bid Cost Recovery. Black Start Energy resulting from a performance test shall also be paid as an Exceptional Dispatch in accordance with Section 11.5.6.1. RMR Units providing Black Start are compensated in accordance with the RMR Contract rather than this Section 11.10.1.5.</p>	
<p>Section 11.10.2, second paragraph</p>	<p>11.10.2 Settlement for User Charges for Ancillary Services * * * *</p> <p>Each Scheduling Coordinator's obligation for Regulation Down Reserve, Regulation Up Reserve, Spinning Reserve, and Non-Spinning Reserve shall be calculated in accordance with this Section 11.10.2, notwithstanding any adjustment to the quantities of each Ancillary Service purchased by the CAISO in accordance with Section 8.2.3.5. The cost of Voltage Support and Black Start shall be allocated to Scheduling Coordinators as described in Sections 11.10.7 and 11.10.8.</p>	<p>The CAISO is proposing to delete language in section 11.10.2 referencing sections 11.10.7 and 11.10.8. These cross references are not necessary to explain the settlement rules for black start or voltage support. In addition, the CAISO has moved language from section 11.10.8 to new proposed section 11.4.</p>
<p>Section 11.10.8</p>	<p>11.10.8 [Not Used] Black Start 11.10.8.1 Black Start Energy The Black Start Energy payment user rate for any Settlement Period will be calculated based on the sum of Black Start Energy payments to Scheduling Coordinators paid in accordance with Section 11.10.1.5, including any Exceptional Dispatch Instructed Imbalance Energy payments for Black Start, in the applicable Settlement Period divided by Measured Demand, excluding exports to neighboring Balancing Authority Areas and excluding Demand within an MSS except as provided by Section 4.9.4.5. The Black Start Energy user charge for any Settlement Period for a Scheduling Coordinator will be the Black Start Energy payment user rate multiplied by the quantity of Measured Demand, excluding exports to neighboring Balancing</p>	<p>The CAISO proposes to move language related to settlement of black start to a new proposed section 11.4 in order to differentiate black start from other ancillary services the CAISO procures through its day-ahead and real-time market processes. Please see rationale for proposed changes to section 11.4, <i>supra</i>.</p>

Tariff Section	Revision	Rationale
	<p>Authority Areas and excluding Demand within an MSS except as provided by Section 4.9.4.4, for which that Scheduling Coordinator is responsible in that Settlement Period.</p>	
Section 11.27	<p>11.27 Voltage Support and Black Start Charges The CAISO shall calculate, account for and settle charges and payments for Voltage Support and Black Start as set out in Sections 11.10.1.4, 11.10.1.5, 11.10.7, 11.10.8, and the applicable Business Practice Manual.</p>	<p>The CAISO proposes to delete language in section 11.27 referencing black start charges. These cross references are not necessary to explain the settlement rules for black start capability or voltage support, which the CAISO proposes to state in new proposed section 11.4.</p>
- Ancillary Services (AS), Appendix A	<p>- Ancillary Services (AS) Regulation, Spinning Reserve, and Non-Spinning Reserve, and Voltage Support and Black Start together with such other interconnected operation services as the CAISO may develop in cooperation with Market Participants to support the transmission of Energy from Generation resources to Loads while maintaining reliable operation of the CAISO Controlled Grid in accordance with WECC standards and Good Utility Practice.</p>	<p>The CAISO proposes to amend the definition of Ancillary Services in its tariff in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes. The current language in section 8.1 may create unnecessary confusion regarding this fact.</p> <p>The CAISO also does not procure voltage support as ancillary services through its day-ahead and real-time market processes. However, stakeholders did not support making a similar change regarding voltage support in the context of this tariff amendment filing. The CAISO will endeavor to address this matter in a separate tariff clarifications filing.</p>
- Black Start Generating Unit, Appendix A	<p>- Black Start Generating Unit A Generating Unit under a system restoration plan for the PTO or CAISO and providing Black Start service under a Black Start Agreement.</p>	<p>The CAISO is proposing to include a new defined term Black Start Generating Unit because the CAISO proposes to use this defined term in new tariff provisions proposed in this filing. Consistent with NERC Reliability Standard EOP-005-02, the definition clarifies that a black start generating unit is a generating unit under a system restoration plan providing black start service pursuant to a black start agreement.</p>
- Black Start Generator, Appendix A	<p>- Black Start Generator A Participating Generator in its capacity as party to an Interim Black Start Agreement with the CAISO for the provision of Black Start services, but shall exclude Participating Generators in their capacity as providers of Black Start services</p>	<p>The CASIO proposes to modify the definition of Black Start Generator to refer to a Participating Generator in its capacity as party to a Black Start Agreement. The CAISO is proposing to delete the reference to an Interim Black Start Agreement because it is modifying that defined term in this filing.</p>

Tariff Section	Revision	Rationale
	under their Reliability Must-Run Contracts.	
- Interim Black Start Agreement, Appendix A	<p>- Interim Black Start Agreement An agreement entered into between the CAISO, a Participating Transmission Owner, and a Participating Generator (other than a Reliability Must-Run Contract) for the provision by the Participating Generator of Black Start capability and Black Start Energy on an interim basis until the introduction by the CAISO of its Black Start auction (or until terminated earlier by either party in accordance with its terms).</p>	The CAISO proposes to modify the defined term <i>Interim Black Start Agreement</i> to read <i>Black Start Agreement</i> . The CAISO proposes to modify the definition to clarify that the agreement is a three party agreement between the CAISO, a participating transmission owners and a participating generator. In addition, the CAISO proposes to remove language from this definition that contemplates the introduction of a black start auction. The CAISO has not pursued and does not intend to pursue the development of an auction process for black start.
- Reliability Services Costs, Appendix A	<p>- Reliability Services Costs The costs associated with services provided by the CAISO: 1) that are deemed by the CAISO as necessary to maintain reliable electric service in the CAISO Balancing Authority Area; and 2) whose costs are billed by the CAISO to the Participating TO pursuant to the CAISO Tariff. Reliability Services Costs include costs charged by the CAISO to a Participating TO associated with service provided under a Reliability Must-Run Contract, or a Black Start Agreement, as well as Exceptional Dispatches and Minimum Load Costs associated with units committed for local reliability requirements.</p>	The CAISO proposes to add costs charged by the CAISO to a participating transmission owner under a black start agreement to the definition of reliability services costs. This change will permit participating transmission owners to allocate the cost of the CAISO securing incremental black start to transmission customers under the participating transmission owners' Commission-approved reliability services tariff.
Appendix D, Black Start Generating Units, introductory sentence	The following requirements must be met by Black Start Generating Units providing Black Start :	The CAISO is proposing a minor change to Appendix D to reflect a new defined term <i>Black Start Generating Units</i> .
Appendix D, Black Start Generating Units, Section (d)	(d) Black Start Generating Units must have Start-Up load pickup capabilities at a level to be determined by the CAISO, including total Start-Up load (MW) and largest Start-Up load (MW) for such power output levels as the CAISO may specify. Each Black Start Generating Unit must be able to start up with a dead primary and station service bus within ten	The CAISO has added existing tariff language from section 8.4.3(b) relating to black start capabilities into Appendix D, which enumerates requirements for black start generating units. This change is part of the CAISO's effort to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.

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	<p>(10) minutes of issuance of an Exceptional Dispatch by the CAISO requiring a Black Start. Each Black Start Generating Unit must be capable of sustaining its output for a minimum period of twelve (12) hours from the time when it first starts delivering Energy. Black Start Agreements may specify a different minimum period.</p>	
<p>Appendix D, Black Start Generating Units, Section (e)</p>	<p>(e) All Black Start Generating Units must be capable of producing reactive Power (boost) and absorbing reactive Power (buck) as required by the CAISO to control system voltages. Each Black Start Generating Unit must provide sufficient reactive capability to keep the energized transmission bus voltages within emergency Voltage Limits over the range of no load to full load. This requirement may be met by the operation of more than one Black Start Generating Unit in parallel providing that:</p>	<p>The CAISO has added existing tariff language from section 8.4.3(b) relating to black start capabilities into Appendix D, which enumerates requirements for black start generating units. This change is part of the CAISO's effort to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p>
<p>Appendix D, Black Start Generating, Section (f)(iv)</p>	<p>(iv) Each Black Start Generator must ensure that normal and emergency voice communications are available to permit effective Exceptional Dispatch of Black Start Generating Units.</p>	<p>The CAISO has added existing tariff language from section 8.4.2(d) relating to black start capabilities into Appendix D, which enumerates requirements for black start generating units. This change is part of the CAISO's effort to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p>
<p>Appendix D, Black Start Generating Units, Sections (g) to (i)</p>	<p>(g) The Scheduling Coordinator for the Black Start Generating Unit shall not use the Black Start Generating Unit to serve any Load other than station service Load required by the Black Start Generating Unit until the CAISO has confirmed that the need for such Black Start service has passed.</p> <p>(h) Black Start Generating Units must pass performance tests for demonstrating Black Start</p>	<p>The CAISO has added existing tariff language from section 8.4.2(d) relating to black start capabilities into Appendix D, which enumerates requirements for black start generating units. This change is part of the CAISO's effort to consolidate tariff provisions relating to black start and in order to clarify that black start is not part of the ancillary services the CAISO procures through its day-ahead and real-time market processes.</p>

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	<p>capability, which the CAISO may periodically undertake in accordance with the CAISO's Operating Procedures for Black Start testing.</p> <p>(i) All Black Start Generating Units will comply with Applicable Reliability Criteria.</p>	<p>The CAISO has also added language to Appendix D, section (h) that requires black start generating units to pass performance tests. This language is consistent with existing authority of the CAISO to conduct performance tests on resources in accordance with the CAISO's operating procedures for black start testing.</p> <p>The CAISO has also included language that black start generating units must adhere to applicable reliability criteria. This tariff provision reinforces black start generating units' obligation to adhere to applicable reliability standards.</p>
<p>Appendix K, Ancillary Service Requirements Protocol (ASRP), Part E – Certification for Black Start</p>	<p style="text-align: center;">PART E [NOT USED] CERTIFICATION FOR BLACK START</p> <p>E 1 – A Generator wishing to provide Black Start capacity from a Generating Unit as an Ancillary Service must meet the requirements stated in Appendix D of the CAISO Tariff in order to be certified by the CAISO to provide Black Start capacity. In addition, the Generating Unit must have a rated capacity 1 MW or greater unless the Generating Unit is participating in an aggregation arrangement approved by the CAISO.</p> <p>E 2 – A Generator wishing to be considered for certification for Black Start service by the CAISO must make a written request to the CAISO. Such request must clearly identify the facilities related to the Generating Unit from which the Generator wishes to provide Black Start and shall identify the Scheduling Coordinator through whom the Generator wishes to offer Black Start service. The Generator shall send a copy of its request to its Scheduling Coordinator at the same time as it sends it to the CAISO. The Generator's written request</p>	<p>The CAISO is proposing to delete the language in Part E of Appendix K to the CAISO tariff because it currently has no application. The CAISO does not certify resources to provide black start using this certification process but instead conducts performance tests of black start generating units in its system restoration plan consistent with NERC Reliability Standard EOP-005-02.</p>

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	<p>must include at least the following:</p> <p>E 2.1—identification of the Generating Unit including Location Code;</p> <p>E 2.2—a single-line electrical diagram of the Generating Unit connections including auxiliary power busses and the connection to the station switchyard;</p> <p>E 2.3—a description of the fuel supply used for Black Start including on-site storage and resupply requirements;</p> <p>E 2.4—a single-line electrical diagram showing the transmission connection from the Generating Unit station switchyard to a connection point on the CAISO Controlled Grid;</p> <p>E 2.5—a description of the Generating Unit capability to provide both real and reactive power, any Start-Up and Shut-Down requirements, any staffing limitations; and</p> <p>E 2.6—a description of the primary, alternate and emergency back-up communications systems currently available to the Generator for communications to the CAISO Control Center.</p> <p>E 3—Upon receipt of the Generator's written request the CAISO shall review the information provided and respond in writing within two weeks of receipt of the request, providing a copy of its response to the Generator's Scheduling Coordinator. The CAISO response may be any of the following:</p> <p>E 3.1—acceptance of the proposal as presented;</p> <p>E 3.2—rejection of the proposal as presented with a rationale for such rejection; or</p> <p>E 3.3—a request for additional information needed by the CAISO to properly evaluate the request.</p> <p>E 4—A Generator receiving a rejection may submit a written</p>	

Tariff Section	Revision	Rationale
	<p>request for reconsideration by the CAISO within 60 days of the date of the rejection notice. A request for reconsideration must address the rationale provided by the CAISO. The CAISO shall respond to a request for reconsideration within 60 days of the date of that request.</p> <p>E 5 A Generator receiving a request for additional information shall provide such information within 60 days of such request providing a copy at the same time to its Scheduling Coordinator. The CAISO shall review the information and respond within 120 days of the date of the CAISO's request for additional information providing a copy at the same time to the Generator's Scheduling Coordinator.</p> <p>E 6 Upon acceptance by the CAISO of the Generator's request and agreement as to the method of communication and control to be used by the Generator, the CAISO shall provisionally approve the proposal in writing providing a copy at the same time to the Generator's Scheduling Coordinator. The Generator may then proceed to procure and install the equipment and make arrangements for the required communication.</p> <p>E 7 Design, acquisition, and installation of the Generator's equipment shall be under the control of the Generator. The CAISO shall bear no cost responsibility or functional responsibility for such equipment. The CAISO shall be responsible for the design, acquisition and installation of any necessary modifications to its own equipment at its own cost.</p> <p>E 8 The Generator shall perform its own testing of its equipment to</p>	

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	<p>ensure that the Black Start system performs to meet the CAISO requirements.</p> <p>E 9 When it is satisfied that its plant, equipment and communication systems meet the CAISO's requirements, the Generator shall request in writing that the CAISO conduct a certification test with a suggested primary date and time and at least two alternative dates and times. The CAISO shall, within two Business Days of receipt of the Generator's request, accept a proposed time if possible or suggest at least three alternatives to the Generator. If the CAISO responds by suggesting alternatives, the Generator shall, within two Business Days of receipt of the CAISO's response, respond in turn by accepting a proposed alternative if possible or suggesting at least three alternatives, and this procedure shall continue until agreement is reached on the date and time of the test. The Generator shall inform its Scheduling Coordinator of the agreed date and time of the test.</p> <p>E 10 Testing shall be performed under the direction of the CAISO. Such tests shall include, but not be limited to, the following:</p> <p>E 10.1 confirmation of control communication path performance;</p> <p>E 10.2 confirmation of primary, secondary, and emergency voice circuits for receipt of Dispatch Instructions;</p> <p>E 10.3 confirmation of the Generating Unit performance; and</p> <p>E 10.4 simulation of a Black Start event.</p> <p>E 11 Upon successful completion of the test, the CAISO shall certify the Generating Unit as being permitted to provide Black Start</p>	

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	<p>capacity as an Ancillary Service and shall provide a copy of the certificate to the Scheduling Coordinator at the same time. The CAISO shall change its Generating Unit data base to reflect the permission for the Generating Unit to provide Black Start service.</p> <p>E-12 The certification to provide Black Start shall remain in force until withdrawn by the Scheduling Coordinator or the Generator by written notice to the CAISO to take effect at the time noticed in the notice, which must be the end of a Trading Day.</p> <p>E-13 The certification may be revoked by the CAISO only under provisions of the ASRP or other provisions of the CAISO Tariff.</p>	

Attachment B – May 2017 Board of Governors' Materials

Black Start and System Restoration

California Independent System Operator Corporation



Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market & Infrastructure Development

Date: April 24, 2017

Re: Decision on black start and system restoration proposal

This memorandum requires Board action.

EXECUTIVE SUMMARY

Pursuant to North American Electricity Reliability Corporation mandatory reliability standard EOP-005-2, System Restoration and Blackstart Resources, transmission operators must have plans for system restoration following widespread outages. These plans must be approved by the transmission operator's reliability coordinator. The ISO operates under an approved system restoration plan which is developed collaboratively by aggregating the restoration plans of the participating transmission owners (PTOs) and augmenting them with any additional requirements. To date, the participating transmission owners have secured the black start resources and absorbed any incremental cost associated with securing this service. The ISO's tariff also provides that the ISO may contract with resources to secure black start service.

The ISO operates under an approved system restoration plan. However, based on the ISO's review of the timelines associated with the ISO's and PTOs' system restoration plans, additional black start capability is necessary to ensure that service restoration time in the Greater Bay Area is reasonably consistent with that of other major population centers in the state. To secure this additional capability, the ISO proposes to contract with a participating generator(s) on a cost-of-service basis. Under this approach, the black start service provider would submit its costs to the Federal Energy Regulatory Commission for acceptance under Section 205 of the Federal Power Act. The incremental cost for the provision of this service is relatively small compared to the overall cost of electricity supply, but fair cost allocation nonetheless remains an important consideration. To this end, the ISO proposes to amend its tariff to more comprehensively allocate incremental black start costs to transmission customers who receive the benefits.

Accordingly, Management proposes to implement tariff changes to identify the costs of black start capability as a reliability services cost, which will allow the applicable PTO to

allocate these costs to transmission customers under its reliability services tariff. Although the ISO has tariff authority to contract with black start resources, existing tariff provisions provide little direction on how the ISO would select resources. To address this, Management also proposes to implement a competitive solicitation process to evaluate potential black start resources. Management seeks Board approval of both the proposed cost allocation rule and the competitive solicitation process for selecting black start resources, including the exercise of the ISO's black start procurement authority on a cost of service basis.

Management recommends the following motion:

Moved, that the ISO Board of Governors approves the proposal for black start and system restoration, as described in the memorandum dated April 24, 2017; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

DISCUSSION AND ANALYSIS

After developing its system restoration plan to comply with NERC standard EOP-005-2, the ISO, in consultation with the PTOs, determined that the estimated restoration time in the Greater Bay Area was not consistent with that of other high density areas in the state. Black start resources in southern California are more evenly distributed near major load centers, while the Greater Bay Area relies on remote resources. As a result, the ISO determined it is necessary to secure additional black start capability to ensure an adequate level of black start service exists for all major load centers in its balancing authority area.

Currently, all black start resources relied upon in the ISO's restoration plan are either owned by the PTO, or under contract with the PTO through a power purchase arrangement. These resources are currently subject to three-party agreements with a zero price term between the ISO, the applicable PTO and the generator. The ISO tariff provides authority for the ISO to enter into black start contracts that also compensate resources for black start capability. The ISO's tariff also provides that scheduling coordinators with demand on the ISO system should pay for this capability. The ISO expects that any new contract it enters to procure additional black start capability will require the ISO to compensate the resource owner to provide that capability. Based on feedback from stakeholders, Management proposes to amend the ISO tariff to define this cost as a reliability services cost. Under this new approach, the ISO will invoice the participating transmission owner where the black start resource is located, and the participating transmission owner will recover the cost from transmission customers under its reliability services tariff. This is how the ISO currently allocates the costs of reliability-must run units.

In order to exercise its tariff authority to contract for additional black start capability, Management recommends utilizing a competitive solicitation process. Management plans to describe this process in its request for proposal, which will include the following steps:

1. The ISO, in consultation with the applicable PTO, will develop a black start technical specification document that defines requirements and key selection criteria.
2. The ISO will conduct an onsite meeting with stakeholders to review the technical requirements and selection criteria and answer interested parties' questions.
3. The ISO will issue a request for proposals for incremental black start resources.
4. The ISO will apply the technical criteria and evaluate the proposals. The ISO will consult with the applicable PTO with respect to how each offer meets the technical requirements.
5. The ISO will apply its selection criteria and select the most technically and commercially viable offer based on the technical and cost data submitted. As part of this selection, the ISO will consider the nature of the costs and whether they are reasonable, as well as what assurances exist that the prospective black start resource will continue to operate over the term of the black start agreement.
6. The ISO will initiate a contracting process with the black start resource. The contract will be a three-party agreement between the ISO, the PTO and the black start resource.

In addition, Management proposes using a cost of service model for compensating black start resources. Under this approach, the black start service provider would submit its costs to the Federal Energy Regulatory Commission for acceptance under Section 205 of the Federal Power Act.

POSITIONS OF THE PARTIES

Stakeholders generally support or do not oppose Management's cost allocation proposal, which generally aligns with allocating the costs to those that benefit from the procurement of the black start capability. In response to stakeholder input, Management modified the steps it will take to evaluate bids in the competitive solicitation process and is working to make technical specifications and a sample black start agreement available to interested bidders.

Throughout the initiative, stakeholders agreed that the ISO should base compensation for black start capability on a cost-of-service model.

CONCLUSION

Management requests Board approval for this proposal. The proposed changes will enable the ISO to provide an estimated restoration time in the Greater Bay Area that is consistent with that of other major population centers in the state, while allocating the costs for these black start resources to customers who are receiving the benefits.

Stakeholder Process: Black Start and System Restoration, Phase 2

Summary of Submitted Comments

Stakeholders submitted three rounds of written comments to the ISO on the following dates:

- Round One, Issue Paper 01/17/2017, Comments received 01/31/2017
- Round Two, Straw Proposal 02/14/2017, Comments received 02/28/2017
- Round Three, Draft Final Proposal 03/14/2017, Comments received 04/04/2017

Stakeholder comments are posted at:

http://www.caiso.com/informed/Pages/StakeholderProcesses/Blackstart_SystemRestorationPhase2.aspx

Other stakeholder efforts include:

- Web Conference 01/24/2017
- Web Conference 02/21/2017
- Web Conference 03/21/2017

Black Start and System Restoration Phase 2 Draft Final Proposal

Stakeholder	Position	Comments	Managements Response
PG&E	General Support	<ul style="list-style-type: none"> • PG&E supports the ISO's changes to the general RFP process steps. The Draft Final Proposal correctly identifies the ISO as the appropriate entity to apply the selection criteria and select the most technically and commercially viable offer based on the technical and cost data submitted. PG&E also appreciates the inclusion of the applicable participating transmission owner (PTO) as a consultant in the development of the black start technical specification document. This consulting function is the appropriate role for the PTO to play in the RFP process. • The ISO notes that Transmission Owners may need to update their reliability services rate schedules in their own Transmission Owner (TO) Tariff. PG&E's preferred approach would be to have the ISO intervene in support of FERC filings where PTOs ask FERC to revise their TO tariffs to allocate reliability services costs to all transmission customers within a participating transmission owner's service area. • PG&E has previously expressed concern related to the short contractual commitment by the ISO and the black start service provider under the current RMR construct. The ISO attempts to address this concern by stating that a five- or (preferably) a ten-year term, evergreen unless cancelled, seems a reasonable approach. PG&E is concerned that this approach will limit the participation in the RFP process. 	<ul style="list-style-type: none"> • The ISO modified its straw proposal to address stakeholder concerns that the applicable PTO may have a conflict in selecting a black start resource when its utility owned generation submitted a bid to provide black start service. The ISO and the applicable PTO will likely incorporate any incremental black start resource into their system restoration plans, so it remains appropriate for the ISO to consult with the applicable PTO in applying the criteria to select a resource to provide incremental black start service. • The ISO has structured the cost allocation of additional black start costs so that the applicable PTO can recover these costs from transmission customers pursuant to the PTO's reliability services tariff. This approach is similar to the cost allocation methodology for the costs of reliability must run units. • The ISO has not established a contract term for black start agreements but will consider the term of an agreement as a factor that will inform the selection of a winning bidder in the competitive solicitation process.
Department of Market Monitoring	Support	<ul style="list-style-type: none"> • First, the ISO proposes that a PTO will not be allowed to help choose the winning black start capacity proposals if that PTO is associated with an entity that submitted a 	<ul style="list-style-type: none"> • The ISO incorporated DMM's comments into its draft final proposal.

Black Start and System Restoration Phase 2 Draft Final Proposal

Stakeholder	Position	Comments	Managements Response
		<p>proposal. Second, the ISO proposes to use a cost of service model as a basis for both black start service offer evaluation and black start service provision compensation. Specifically, the ISO proposes to consider technical criteria, cost of black start service procurement and ongoing provision as well as existing assurances that the resource will continue to operate over the term of the black start agreement. DMM supports each of these measures.</p> <ul style="list-style-type: none"> • It is DMM's understanding that the ISO intends that any accepted offer will be reviewed by FERC to ensure that it is reasonable. DMM recommends that the ISO clarify in the Final Proposal presented to the ISO's Board any other processes that the ISO is proposing to use to evaluate whether black start service offers or provision costs are reasonable before the final selected offers are sent to FERC. 	<ul style="list-style-type: none"> • DMM is correct that any black start agreement and rate charged by the black start resource will be subject to FERC review and acceptance. The ISO plans to evaluate proposed costs for black start capability submitted by bidders through a competitive solicitation process
NRG Energy, Inc	Support	<ul style="list-style-type: none"> • NRG supports the ISO procuring black start service through a competitive solicitation among the resources that would be qualified to provide the service by virtue of being located in the area in which the black start service is required. • NRG reiterates its request for the ISO to provide as much information as possible to prospective bidders prior to the competitive solicitation, including, but not limited to: <ul style="list-style-type: none"> ○ The electric and geographic area in which the ISO will seek to procure black start service, including providing clear electrical boundaries of the defined area by substation or circuit; ○ The black start operating characteristics that will be required (startup time, energy duration required, etc.) ○ The reliability standard and ISO tariff and relevant BPM requirements with which the black start resource owner will have to comply; ○ The detailed criteria which the ISO will use to evaluate 	<ul style="list-style-type: none"> • The ISO's draft final proposal incorporates this mechanism to procure incremental black start service. • The ISO is currently working to develop the technical specifications and a sample contract for the procurement of incremental black start resources for the Greater Bay Area. These documents will detail bidder requirements and evaluation criteria that the ISO will use to evaluate black start proposals and are targeted to be released in early May. In addition, the ISO will host a technical workshop to review the requirements and answer prospective bidder questions prior to the issuance of a black start service RFP. The ISO has not yet set a date for the black start technical workshop.

Black Start and System Restoration Phase 2 Draft Final Proposal

Stakeholder	Position	Comments	Managements Response
		<p>and select the black start resource, including how the source of the black start power will be evaluated and how alternate on-line dates will be considered; and</p> <ul style="list-style-type: none"> ○ Other information that would be useful for the prospective bidders to know when responding to the solicitation. <ul style="list-style-type: none"> • NRG does not oppose the black start agreement being a three-party agreement between the PTO, the resource owner and the ISO. NRG appreciates the ISO's commitment to releasing a pro-forma copy of the black start agreement prior to the solicitation. From the ISO's schedule, it is not clear if there will be an opportunity for market participants to comment on the proposed pro-forma agreement, or if the only opportunity for modifying the proposed pro forma agreement will be for the owner of the resource selected in the competitive solicitation. • NRG agrees that a cost-of-service approach is reasonable. • NRG reiterates that it will be important for the ISO and PTO to address the potential for or perception of conflicts of interest with the PTO through the black start selection process. • NRG supports the ISO's proposal to allocate the costs of black start service through the PTO's Reliability Services tariff. 	<ul style="list-style-type: none"> • The sample Black Start agreement the ISO will release will serve as a framework for the contract to be developed with the successful black start service provider. The ISO expects the seller to file the contract with FERC. Market participants will be able to comment on the document during the ISO's black start technical workshop. • The ISO modified its straw proposal to clarify that black start resources would provide black start service on a cost-of-service model. • The ISO developed the RFP process steps as part of the Black Start and System Restoration Phase 2 Stakeholder Initiative. The ISO modified the proposal during the stakeholder process to address conflict of interest concerns. • The ISO has structured the cost allocation of additional black start costs so that the applicable PTO can recover these costs from transmission customers pursuant to the PTO's reliability services tariff. This approach is similar to the cost allocation methodology for the costs of reliability must run units.

Black Start and System Restoration Phase 2 Draft Final Proposal

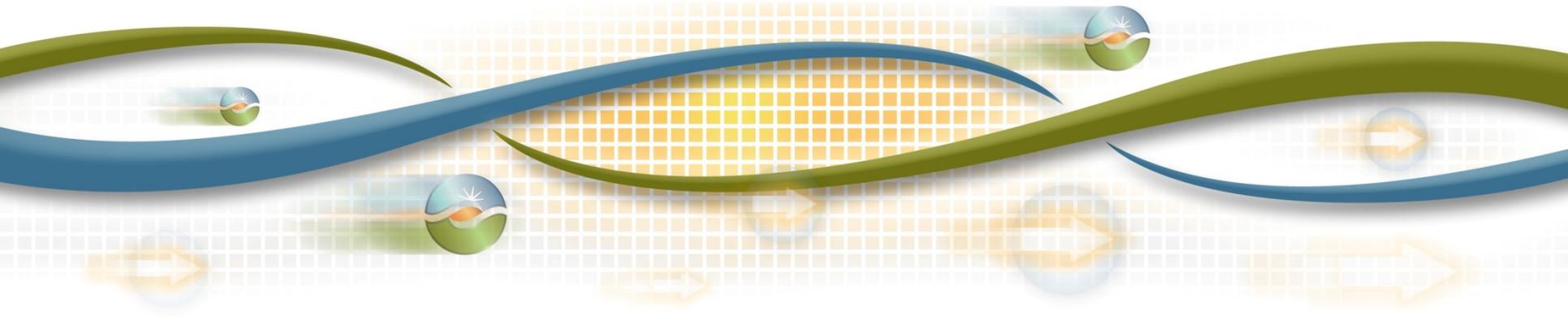
Stakeholder	Position	Comments	Managements Response
Office of Ratepayer Advocates (ORA)	Does not oppose	<ul style="list-style-type: none"> • ORA believes that PTOs should acquire additional black start resources and recover costs under the existing model, which has worked well since its inception. The current method allows the CPUC to review the costs and would be more efficient and less costly than a new request for proposal (RFP) process. Only in the event that a PTO is not able to acquire the necessary black start resources, should the ISO assume the responsibility for acquiring the black start capability under its proposed RFP process. For example, if a PTO needed to acquire additional black start resources from independent power producers, allowing that PTO to review the financial information of independent power producers as part of the procurement process would raise anticompetitive concerns. • To ensure that the costs of these additional black start resources are cost-based, ORA recommends the use of standardized selection criteria and contract agreement terms. • ORA also supports consideration of a soft offer cap, similar to the market power mechanism in place for capacity, as recommended by the DMM. • ORA recommends standardized agreement terms to ensure that included costs are based on industry standards. 	<ul style="list-style-type: none"> • The ISO is proposing to secure additional black start capability to support its system restoration plan under NERC reliability standards. As part of this effort, the ISO is proposing a cost allocation approach that allows the PTO to allocate the costs to its transmission customers as opposed to allocating black start costs solely to the PTO's retail bundled load. <p>The ISO notes that the Office of Ratepayer Advocates supports the use of the existing cost allocation system in allocating the black start costs associated with Utility Owned Generation. Furthermore, ORA identifies conditions in which it believes competitive solicitation for black start services is required. The ISO believes these conditions exist today in the Greater Bay Area and is the basis of the current stakeholder initiative and associated incremental black start RFP.</p> <ul style="list-style-type: none"> • ISO is developing a sample contract for incremental black start resources. The provisions and terms will be made available for comment prior to the issuance of an RFP. • The ISO has not incorporated this element into the competitive solicitation process because the ISO will procure incremental black start service on a cost-of-service basis. • The ISO plans to issue a sample contract for review and discussion with stakeholders. The ISO contemplates that the agreement will have standardized terms to ensure costs are based on industry standards.



Decision on black start and system restoration proposal

Scott Vaughan, P.E.
Lead Engineer, Grid Assets

Board of Governors Meeting
General Session
May 1-2, 2017



The ISO has identified a need to provide additional black start resources in the Greater Bay Area.

- The ISO's restoration plan is based upon the participating transmission owners' plans, then reviewed and augmented as necessary by the ISO
- The ISO determined that the estimated restoration time in the Greater Bay Area is materially longer than other high density areas in the state due to the location of the existing black start resources.
- The current tariff specifies that all scheduling coordinators in the Balancing Authority pay for capability procured by the ISO.

Cost allocation methodology and principles for the new black start resources

- Due to the limited number of resources available and concerns over the exercising of market power, financial compensation is proposed to be based on a cost of service model.
- Cost allocation is proposed to be based on FERC's cost allocation principle that rates should reasonably align costs with those benefitting.
- ISO proposes to invoice the PTO for incremental black start costs. The PTO will recover the costs through their reliability services tariff.

The steps the ISO proposes to will take to procure and contract new black start resources in the Greater Bay Area are:

1. Develop technical specification and key criteria.
2. Stakeholder meeting to review requirements.
3. Issue a request for proposal
4. Evaluate and review submitted proposal technical and commercial information.
5. Select the 2 most technically and commercially viable black start resources.
6. Enter into a three party contract with the successful bidders.

Management recommends the Board approve this proposal and the filing of the necessary tariff changes with FERC to allocate incremental black start costs to local areas.

- Provides a process for supplying a critical urban area with system restoration on comparable basis as the rest of the state.
- Allocates costs for black start services to those who benefit from the service.
- Provides reasonable compensation, based on a cost of service model, to those providing the black start service.
- All commenters supported or did not oppose the proposal.



**Board of Governors May 1-2, 2017
General Session**

Decision on black start and system restoration proposal

Motion

Moved, that the ISO Board of Governors approves the proposal for black start and system restoration, as described in the memorandum dated April 24, 2017; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

Moved: Olsen

Second: Bhagwat

Board Action:	Passed	Vote Count:	5-0
Bhagwat	Y		
Ferron	Y		
Galiteva	Y		
Mullin	Y		
Olsen	Y		

Motion Number: 2017-05-G2

Attachment C – Clean Tariff Records
Black Start and System Restoration
California Independent System Operator Corporation

4.9.4 MSS Operator Responsibilities

* * * *

4.9.4.4 be responsible for any Reliability Must-Run Generation and Voltage Support required for reliability of the MSS, including the responsibility for any costs of such Reliability Must-Run Generation, and Voltage Support and may satisfy this requirement through Generating Units owned by the MSS Operator or under contract to the MSS Operator; and

4.9.4.5 [Not Used]

* * * *

5. Black Start and System Restoration

5.1 Black Start Capability

The CAISO shall determine the amount and location of Black Start Generation it requires through a system restoration plan that meets the requirements of Applicable Reliability Criteria. In making this determination, the CAISO shall consult with Participating Transmission Owners.

Participating Transmission Owners with their own system restoration plans that include transmission lines and associated facilities that are part of the CAISO Controlled Grid shall upon the request of the CAISO provide the CAISO with these system restoration plans. The CAISO shall consider Participating Transmission Owners' system restoration plans in developing a system restoration plan for the CAISO Balancing Authority Area and may identify Black Start Generation needs for the CAISO Balancing Authority Area not identified in Participating Transmission Owner's system restoration plans.

Scheduling Coordinators shall notify the CAISO of their Load restoration time requirements for any Loads that provide emergency services. This notice shall include the MW amount of Load, required restoration time, and associated Node on the CAISO Controlled Grid. For purposes of preparing system restoration plans, the CAISO shall consult with applicable Participating Transmission Owners concerning any Load restoration information provided by Scheduling Coordinators.

5.2 Black Start Units

The CAISO shall contract annually (or for such other period as the CAISO may determine is economically advantageous) for Black Start services. The CAISO will select Black Start Generating Units in locations where adequate transmission capacity can be made readily available (assuming no transmission damage) to connect the Black Start Generating Unit to energize the station service bus or dead transmission bus of a Generating Unit designated by the CAISO. Black Start Generating Units:

- (a) must be located in the CAISO Balancing Authority Area;
- (b) may be located anywhere in the CAISO Balancing Authority Area provided that the Black Start Generating Unit is capable of meeting the CAISO performance requirements for starting and interconnecting to the CAISO Controlled Grid; but
- (c) must be dispersed throughout the CAISO Balancing Authority Area.

5.3 Black Start Services

- (a) All Participating Generators with Black Start Generating Units must satisfy technical requirements specified in Appendix D of the CAISO Tariff and the Participating Generators' Black Start Agreement in relation to the Black Start Generating Units.
- (b) The CAISO shall from time to time undertake performance tests, with or without prior notification.
- (c) The CAISO shall have the sole right to determine when the operation of Black Start Generating Units is required to respond to conditions on the CAISO Controlled Grid.
- (d) If the CAISO has suspended the market for Energy and/or Ancillary Services pursuant to Section 7.7.3, the price paid by the CAISO for Black Start services shall be sufficient to permit the relevant Participating Generator to recover its costs over the period that it is directed to operate by the CAISO.
- (e) If a Black Start Generating Unit fails to achieve a Black Start when called upon by the CAISO, or fails to pass a performance test administered by the CAISO, the Market Participant that has contracted to supply Black Start service from the Generating Unit shall be subject to remedies or penalties as specified in its Black Start Agreement.

- (f) The CAISO will dispatch Black Start Generating Units as required in accordance with the applicable Black Start Agreement.

* * * *

8.1 Scope

The CAISO shall be responsible for ensuring that there are sufficient Ancillary Services available to maintain the reliability of the CAISO Controlled Grid consistent with NERC and WECC reliability standards and any requirements of the NRC. The CAISO's Ancillary Services requirements may be self-provided by Scheduling Coordinators as further provided in the Business Practice Manuals. Those Ancillary Services which the CAISO requires to be available but which are not being self-provided will be competitively procured by the CAISO from Scheduling Coordinators in the Day-Ahead and Real-Time Markets consistent with Section 8.3. The provision of Ancillary Services from the Interties with interconnected Balancing Authority Areas is limited to Ancillary Services bid into the competitive procurement processes in the IFM and RTM. The CAISO will not accept Submissions to Self-Provide Ancillary Services that are imports to the CAISO Balancing Authority Area over the Interties with interconnected Balancing Authority Areas, except from Dynamic System Resources certified to provide Ancillary Services or if provided pursuant to ETCs, TORs or Converted Rights. The CAISO will accept Submissions to Self-Provide Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area if they are certified to provide Ancillary Services. The CAISO will calculate payments for Ancillary Services supplied by Scheduling Coordinators and charge the cost of Ancillary Services to Scheduling Coordinators based on their Ancillary Service Obligations.

For purposes of this CAISO Tariff, Ancillary Services are: (i) Regulation Up and Regulation Down; (ii) Spinning Reserve; (iii) Non-Spinning Reserve; and (iv) Voltage Support.

These services will be procured as stated in Section 8.3.5. Bids for these services may be submitted by a Scheduling Coordinator for resources that are capable of providing the specific service and that meet applicable Ancillary Service standards and technical requirements, as set forth in Sections 8.1 through 8.4, and are certified by the CAISO to provide Ancillary Services. Identification of specific services in this

CAISO Tariff shall not preclude development of additional interconnected operation services over time. The CAISO and Market Participants will seek to develop additional categories of these unbundled services over time as the operation of the CAISO Controlled Grid matures or as required by regulatory authorities.

* * * *

8.2.3 Quantities of Ancillary Services Required; Use of AS Regions

* * * *

8.2.3.4 [Not Used]

* * * *

8.3.1 Procurement of Ancillary Services

The CAISO shall operate competitive Day-Ahead and Real-Time Markets to procure Ancillary Services. The Security Constrained Unit Commitment (SCUC) and Security Constrained Economic Dispatch (SCED) applications used in the Integrated Forward Market (IFM) and the Real-Time Market (RTM) shall calculate optimal resource commitment, Energy, and Ancillary Services Awards and Schedules at least cost to End-Use Customers consistent with maintaining System Reliability. Any Scheduling Coordinator representing resources, System Units, Participating Loads, Proxy Demand Resources or imports of System Resources may submit Bids into the CAISO's Ancillary Services markets provided that it is in possession of a current certificate for the resources concerned. Regulation Up, Regulation Down, and Operating Reserves necessary to meet CAISO requirements not met by self-provision will be procured by the CAISO as described in this CAISO Tariff. The amount of Ancillary Services procured in the IFM is based on the CAISO Forecast Of CAISO Demand and the forecasted intertie schedules in the RTM for the Operating Hour net of (i) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services and (ii) Ancillary

Services self-provided pursuant to an ETC, TOR or Converted Right. The amount of additional Ancillary Services procured in the RTM is based on the CAISO Forecast Of CAISO Demand, the Day-Ahead Schedules established net interchange, and the forecast of the Intertie Schedules for the Operating Hour in the RTM net of (i) available awarded Day-Ahead Ancillary Services, (ii) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services, and (iii) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The amount of Ancillary Services procured in the Real-Time Market is based upon the CAISO Forecast Of CAISO Demand and the net interchange for the Operating Hour from FMM Schedules net of (i) available awarded Day-Ahead Ancillary Services, (ii) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services, (iii) additional Operating Reserves procured in the FMM, and (iv) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The CAISO may procure incremental Ancillary Services in the Real-Time Market based in part on a determination during the FMM that any Ancillary Services capacity awarded or self-provided in the Day-Ahead Market is not available as a result of a resource constraint or Transmission Constraints. Resource constraints may include but are not limited to an Outage of a resource or Ramp Rate constraints. Incremental procurement in the Real-Time Market will exclude Ancillary Services Capacity the CAISO has determined is not available. The CAISO will manage the Energy from both CAISO-procured and Self-Provided Ancillary Services as part of the FMM and Real-Time Dispatch. In the Day-Ahead Market, the CAISO procures one-hundred (100) percent of its Ancillary Service requirements based on the Day-Ahead Demand Forecast net of Self-Provided Ancillary Services. After the Day-Ahead Market, the CAISO procures additional Ancillary Services needed to meet system requirements from all resources in the Real-Time Market. The amount of Ancillary Services procured in the Real-Time Market is based on the CAISO Forecast Of CAISO Demand for the Operating Hour net of Self-Provided Ancillary Services. Awards of AS in the RTM to Non-Dynamic System Resources are for the entire next Operating Hour. The CAISO procurement of Ancillary Services from all other resources in the Real-Time Market is for a fifteen

(15) minute FMM interval. The CAISO's procurement of Ancillary Services from Non-Dynamic System Resources, Dynamic System Resources and internal Generation (which includes Generation from Generating Units that are Pseudo-Ties to the CAISO Balancing Authority Area) in the Real-Time Market is based on the Ancillary Service Bids submitted or generated in the RTM consistent with the requirements in Section 30. The CAISO may also procure Ancillary Services pursuant to the requirements in Section 42.1 and as permitted under the terms and conditions of a Reliability Must-Run Contract.

The CAISO will contract for long-term Voltage Support service with owners of Reliability Must-Run Units under Reliability Must-Run Contracts. These requirements and standards apply to all Ancillary Services whether self-provided or procured by the CAISO.

* * * *

8.3.4 Certification and Testing Requirements

The owner of and Scheduling Coordinator for each resource for which a Bid to provide Ancillary Services or Submission to Self-Provide Ancillary Services is allowed under the CAISO Tariff, and all other System Resources that are allowed to submit a Bid to provide Ancillary Services under this CAISO Tariff, must comply with the CAISO's certification and testing requirements as contained in Appendix K and the CAISO's Operating Procedures. Each resource used to bid Regulation or used to self-provide Regulation must have been certified and tested by the CAISO using the process defined in Part A of Appendix K. Each Dynamic System Resource offering Regulation must comply with the Dynamic Scheduling Protocol in Appendix M. Spinning Reserve may be provided only from resources that have been certified and tested by the CAISO using the process defined in Part B of Appendix K. Non-Spinning Reserve may be provided from resources that have been certified and tested by the CAISO using the process defined in Part C of Appendix K. CAISO certification to provide Ancillary Services may be revoked by the CAISO under the provisions of this CAISO Tariff, including Appendix K.

8.3.5 Daily and Hourly Procurement

The CAISO shall procure Regulation Up, Regulation Down, Spinning Reserve, and Non-Spinning Reserve on a daily and Real-Time basis in the IFM and RTM, respectively. The CAISO shall procure

Ancillary Services on a longer-term basis pursuant to Section 42.1.3 if necessary to meet Reliability Criteria. The CAISO shall contract for Voltage Support annually (or for such other period as the CAISO may determine is economically advantageous) and on a daily or hourly basis as required to maintain System Reliability.

* * * *

8.4.2 Ancillary Service Control Standards

The providers of Ancillary Services under this Tariff must comply with the following control standards:

- (a) Regulation. The Area Control Error will be calculated by the CAISO Energy Management System. Control signals will be sent from the CAISO EMS to raise or lower the output of resources providing Regulation when ACE exceeds the allowable CAISO Balancing Authority Area dead band for ACE;
- (b) Spinning Reserve and Non-Spinning Reserve. Each provider of Spinning Reserve or Non-Spinning Reserve must be capable of receiving a Dispatch Instruction within one (1) minute from the time the CAISO Control Center elects to Dispatch the Spinning Reserve resource or Non-Spinning Reserve resource and must ensure that its resource can be at the Dispatched operating level within ten (10) minutes after issuance of the Dispatch Instruction; and
- (c) Voltage Support. Generating Units providing Voltage Support must have automatic voltage regulators which can correct the bus voltages to be within the prescribed Voltage Limits and within the machine capability in less than one (1) minute.

8.4.3 Ancillary Service Capability Standards

The providers of Ancillary Services under this CAISO Tariff must comply with the following capability standards for Spinning Reserve and Non-Spinning Reserve Capability. Each resource or external import of a System Resource scheduled to provide Spinning Reserve and each resource providing Non-Spinning Reserve must be capable of converting the full capacity reserved to Energy production within ten (10)

minutes after the issue of the Dispatch Instruction by the CAISO. Each resource scheduled to provide Spinning Reserve and each resource scheduled to provide Non-Spinning Reserve must be capable of maintaining that output or scheduled Interchange for at least thirty (30) minutes from the point at which the resources reaches its award capacity.

* * * *

8.4.6 Metering Infrastructure

[Sub-Section 8.4.6.1 was deleted in its entirety and there are no changes to Section 8.4.6]

* * * *

8.8 [Not Used]

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8.9.5 [Not Used]

* * * *

8.9.13 [Not Used]

* * * *

8.10.5 [Not Used]

* * * *

11.4 Black Start Settlements

Payments for Black Start capability shall consist of any payments under any Black Start Agreement. If the Energy price and Start-Up Costs are not specified in the Black Start Agreement, the Black Start Energy will be paid as an Exceptional Dispatch in accordance with Section 11.5.6.1 and the resource will be entitled to Bid Cost Recovery. Black Start Energy resulting from a performance test shall also be paid as an Exceptional Dispatch in accordance with Section 11.5.6.1. RMR Units providing Black Start are compensated in accordance with the RMR Contract rather than this Section 11.4.

11.4.1 Black Start Energy

The Black Start Energy payment user rate for any Settlement Period will be calculated based on the sum of Black Start Energy payments to Scheduling Coordinators in the applicable Settlement Period divided by Measured Demand, excluding exports to neighboring Balancing Authority Areas. The Black Start Energy user charge for any Settlement Period for a Scheduling Coordinator will be the Black Start Energy payment user rate multiplied by the quantity of Measured Demand, excluding exports to neighboring Balancing Authority Areas, for which that Scheduling Coordinator is responsible in that Settlement Period.

11.4.2 Black Start Capability

The CAISO shall allocate payments for Black Start capability under a Black Start Agreement as Reliability Services Costs to the Participating Transmission Owner in whose Service Area where the Black Start Unit is located.

* * * *

11.5.6 Settlement Amounts for RTD IIE From Exceptional Dispatch

* * * *

11.5.6.5 Settlement of RTD IIE from Black Start

Unless otherwise specified in a Black Start Agreement, all RTD IIE Settlement Amounts associated with Black Start receive the Exceptional Dispatch Settlement price as provided in Section 11.5.6.1, but the costs are allocated pursuant to Section 11.4.

* * * *

11.10.1 Settlements for Contracted Ancillary Services

* * * *

11.10.1.5 [Not Used]

* * * *

11.10.2 Settlement for User Charges for Ancillary Services

The CAISO shall determine a separate hourly user rate for Regulation Down Reserve, Regulation Up Reserve, Spinning Reserve, and Non-Spinning Reserve purchased for each Settlement Period. The hourly user rates for Regulation Down, Regulation Up, Spinning Reserve, and Non-Spinning Reserve include the cost incurred by the CAISO across the Day-Ahead Market and the Real-Time Market to procure this service. In computing the user rate for each service the quantity (MW) and costs of any substituting Ancillary Service will be treated as if they are costs and MW associated with the Ancillary Service need they are being used to fulfill. Each rate will be charged to Scheduling Coordinators on a volumetric basis applied to each Scheduling Coordinator's obligation for the specific Ancillary Service concerned which it has not self-provided, as adjusted by any Inter-SC Trades of Ancillary Services. Each Scheduling Coordinator's obligation for Regulation Down Reserve, Regulation Up Reserve, Spinning Reserve, and Non-Spinning Reserve shall be calculated in accordance with this Section 11.10.2, notwithstanding any adjustment to the quantities of each Ancillary Service purchased by the CAISO in accordance with Section 8.2.3.5.

[The remainder of Section 11.10.2 is omitted as there are no additional changes]

* * * *

11.10.8 [Not Used]

* * * *

11.27 Voltage Support Charges

The CAISO shall calculate, account for and settle charges and payments for Voltage Support as set out in Sections 11.10.1.4, 11.10.7, and the applicable Business Practice Manual.

* * * *

- Ancillary Services (AS)

Regulation, Spinning Reserve, Non-Spinning Reserve, and Voltage Support with such other interconnected operation services as the CAISO may develop in cooperation with Market Participants to support the transmission of Energy from Generation resources to Loads while maintaining reliable operation of the CAISO Controlled Grid in accordance with WECC standards and Good Utility Practice.

* * * *

- Black Start Generating Unit

A Generating Unit under a system restoration plan for the PTO or CAISO and providing Black Start service under a Black Start Agreement.

* * * *

- Black Start Generator

A Participating Generator in its capacity as party to a Black Start Agreement with the CAISO for the provision of Black Start services, but shall exclude Participating Generators in their capacity as providers of Black Start services under their Reliability Must-Run Contracts.

* * * *

- Black Start Agreement

An agreement entered into between the CAISO, a Participating Transmission Owner, and a Participating Generator (other than a Reliability Must-Run Contract) for the provision by the Participating Generator of Black Start capability and Black Start Energy.

* * * *

- Reliability Services Costs

The costs associated with services provided by the CAISO: 1) that are deemed by the CAISO as necessary to maintain reliable electric service in the CAISO Balancing Authority Area; and 2) whose costs are billed by the CAISO to the Participating TO pursuant to the CAISO Tariff. Reliability Services Costs include costs charged by the CAISO to a Participating TO associated with service provided under a Reliability Must-Run Contract, or a Black Start Agreement, as well as Exceptional Dispatches and Minimum Load Costs associated with units committed for local reliability requirements.

* * * *

Appendix D

Black Start Generating Units

The following requirements must be met by Black Start Generating Units:

- (a) Black Start Generating Units must be capable of starting and paralleling with the CAISO Controlled Grid without aid from the CAISO Controlled Grid;
- (b) Black Start Generating Units must be capable of making a minimum number of starts per event (to be without aid from the CAISO Controlled Grid as determined by the CAISO);
- (c) Black Start Generating Units must be equipped with governors capable of operating in the stand alone (asynchronous) and parallel (synchronous) modes.
- (d) Black Start Generating Units must have Start-Up load pickup capabilities at a level to be determined by the CAISO, including total Start-Up load (MW) and largest Start-Up load (MW) for such power output levels as the CAISO may specify. Each Black Start Generating Unit must be able to start up with a dead primary and station service bus within ten (10) minutes of issuance of an Exceptional Dispatch by the CAISO requiring a Black Start. Each Black Start Generating Unit must be capable of sustaining its output for a minimum period of twelve (12) hours from the time when it first starts delivering Energy. Black Start Agreements may specify a different minimum period.
- (e) All Black Start Generating Units must be capable of producing reactive Power (boost) and

absorbing reactive Power (buck) as required by the CAISO to control system voltages. Each Black Start Generating Unit must provide sufficient reactive capability to keep the energized transmission bus voltages within emergency Voltage Limits over the range of no load to full load. This requirement may be met by the operation of more than one Black Start Generating Unit in parallel providing that:

- (i) the Black Start Generation supplier demonstrates that the proposed Generation resource shares reactive burden equitably;
- (ii) all Participating Generators associated with the proposed Black Start source are located in the same general area.

Buck/boost capability requirement shall be dependent on the location of the proposed resource in relation to Black Start load.

- (f) All Black Start Generating Units must have the following communication/control requirements:
 - (i) dial-up telephone;
 - (ii) backup radio;
 - (iii) manning levels which accord with Good Utility Practice.
 - (iv) Each Black Start Generator must ensure that normal and emergency voice communications are available to permit effective Exceptional Dispatch of Black Start Generating Units.
- (g) The Scheduling Coordinator for the Black Start Generating Unit shall not use the Black Start Generating Unit to serve any Load other than station service Load required by the Black Start Generating Unit until the CAISO has confirmed that the need for such Black Start service has passed.
- (h) Black Start Generating Units must pass performance tests for demonstrating Black Start capability, which the CAISO may periodically undertake in accordance with the CAISO's Operating Procedures for Black Start testing.
- (i) All Black Start Generating Units will comply with Applicable Reliability Criteria.

* * * *

Appendix K Ancillary Service Requirements Protocol (ASRP)

* * * *

PART E **[NOT USED]**

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Attachment D – Marked Tariff Records
Black Start and System Restoration
California Independent System Operator Corporation

4.9.4 MSS Operator Responsibilities

* * * *

4.9.4.4 be responsible for any Reliability Must-Run Generation and Voltage Support required for reliability of the MSS, including the responsibility for any costs of such Reliability Must-Run Generation, and Voltage Support and may satisfy this requirement through Generating Units owned by the MSS Operator or under contract to the MSS Operator; and

~~4.9.4.5 [Not Used] be responsible for Black Start requirements for reliability of the MSS, however, if the MSS Operator can self-provide this requirement, the MSS Operator shall not pay its pro-rata share of the Black Start requirement in accordance with Section 11; and~~

* * * *

~~5. Black Start and System Restoration [Not Used]~~

~~5.1 Black Start Capability~~

~~The CAISO shall determine the amount and location of Black Start Generation it requires through a system restoration plan that meets the requirements of Applicable Reliability Criteria. In making this determination, the CAISO shall consult with Participating Transmission Owners.~~

~~Participating Transmission Owners with their own system restoration plans that include transmission lines and associated facilities that are part of the CAISO Controlled Grid shall upon the request of the CAISO provide the CAISO with these system restoration plans. The CAISO shall consider Participating Transmission Owners' system restoration plans in developing a system restoration plan for the CAISO Balancing Authority Area and may identify Black Start Generation needs for the CAISO Balancing Authority Area not identified in Participating Transmission Owner's system restoration plans.~~

~~Scheduling Coordinators shall notify the CAISO of their Load restoration time requirements for any Loads that provide emergency services. This notice shall include the MW amount of Load, required restoration time, and associated Node on the CAISO Controlled Grid. For purposes of preparing system restoration plans, the CAISO shall consult with applicable Participating Transmission Owners concerning any Load restoration information provided by Scheduling Coordinators.~~

5.2 Black Start Units

The CAISO shall contract annually (or for such other period as the CAISO may determine is economically advantageous) for Black Start services. The CAISO will select Black Start Generating Units in locations where adequate transmission capacity can be made readily available (assuming no transmission damage) to connect the Black Start Generating Unit to energize the station service bus or dead transmission bus of a Generating Unit designated by the CAISO. Black Start Generating Units:

- (a) must be located in the CAISO Balancing Authority Area;
- (b) may be located anywhere in the CAISO Balancing Authority Area provided that the Black Start Generating Unit is capable of meeting the CAISO performance requirements for starting and interconnecting to the CAISO Controlled Grid; but
- (c) must be dispersed throughout the CAISO Balancing Authority Area.

5.3 Black Start Services

- (a) All Participating Generators with Black Start Generating Units must satisfy technical requirements specified in Appendix D of the CAISO Tariff and the Participating Generators' Black Start Agreement in relation to the Black Start Generating Units.
- (b) The CAISO shall from time to time undertake performance tests, with or without prior notification.
- (c) The CAISO shall have the sole right to determine when the operation of Black Start Generating Units is required to respond to conditions on the CAISO Controlled Grid.
- (d) If the CAISO has suspended the market for Energy and/or Ancillary Services pursuant to Section 7.7.3, the price paid by the CAISO for Black Start services shall be sufficient to permit the relevant Participating Generator to recover its costs over the period that it is directed to operate by the CAISO.
- (e) If a Black Start Generating Unit fails to achieve a Black Start when called upon by the CAISO, or fails to pass a performance test administered by the CAISO, the Market Participant that has contracted to supply Black Start service from the Generating Unit shall be subject to remedies or penalties as specified in its Black Start Agreement.

(f) The CAISO will dispatch Black Start Generating Units as required in accordance with the applicable Black Start Agreement.

* * * *

8.1 Scope

The CAISO shall be responsible for ensuring that there are sufficient Ancillary Services available to maintain the reliability of the CAISO Controlled Grid consistent with NERC and WECC reliability standards and any requirements of the NRC. The CAISO's Ancillary Services requirements may be self-provided by Scheduling Coordinators as further provided in the Business Practice Manuals. Those Ancillary Services which the CAISO requires to be available but which are not being self-provided will be competitively procured by the CAISO from Scheduling Coordinators in the Day-Ahead and Real-Time Markets consistent with Section 8.3. The provision of Ancillary Services from the Interties with interconnected Balancing Authority Areas is limited to Ancillary Services bid into the competitive procurement processes in the IFM and RTM. The CAISO will not accept Submissions to Self-Provide Ancillary Services that are imports to the CAISO Balancing Authority Area over the Interties with interconnected Balancing Authority Areas, except from Dynamic System Resources certified to provide Ancillary Services or if provided pursuant to ETCs, TORs or Converted Rights. The CAISO will accept Submissions to Self-Provide Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area if they are certified to provide Ancillary Services. The CAISO will calculate payments for Ancillary Services supplied by Scheduling Coordinators and charge the cost of Ancillary Services to Scheduling Coordinators based on their Ancillary Service Obligations.

For purposes of this CAISO Tariff, Ancillary Services are: (i) Regulation Up and Regulation Down;^{1.7} (ii) Spinning Reserve;^{1.7} (iii) Non-Spinning Reserve;^{1.7} and (iv) Voltage Support, ~~and (v) Black Start capability.~~ These services will be procured as stated in Section 8.3.5. Bids for these services may be submitted by a Scheduling Coordinator for resources that are capable of providing the specific service and that meet applicable Ancillary Service standards and technical requirements, as set forth in Sections 8.1 through 8.4, and are certified by the CAISO to provide Ancillary Services. Identification of specific services in this

CAISO Tariff shall not preclude development of additional interconnected operation services over time. The CAISO and Market Participants will seek to develop additional categories of these unbundled services over time as the operation of the CAISO Controlled Grid matures or as required by regulatory authorities.

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8.2.3 Quantities of Ancillary Services Required; Use of AS Regions

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8.2.3.4 ~~[Not Used] Black Start Capability~~

~~The CAISO shall determine the amount and location of Black Start Generation it requires through a system restoration plan that meets the requirements of Applicable Reliability Criteria. In making this determination, the CAISO shall consult with Participating Transmission Owners.~~

~~Participating Transmission Owners with their own system restoration plans that include transmission lines and associated facilities that are part of the CAISO Controlled Grid shall upon the request of the CAISO provide the CAISO with these system restoration plans. The CAISO shall consider Participating Transmission Owners' system restoration plans in developing a system restoration plan for the CAISO system and may identify Black Start Generation needs for the CAISO system not identified in Participating Transmission Owners' system restoration plans.~~

~~Scheduling Coordinators shall notify the CAISO of their Load restoration time requirements for any Loads that provide emergency services. This notice shall include the MW amount of Load, required restoration time, and associated Node on the CAISO Controlled Grid. For purposes of preparing system restoration plans, the CAISO shall consult with applicable Participating Transmission Owners concerning any Load restoration information provided by Scheduling Coordinators.~~

~~8.2.3.4.1 Black Start Units~~

~~The CAISO will select Black Start capacity in locations where adequate transmission capacity can be made readily available (assuming no transmission damage) to connect the Black Start Generating Unit to the station service bus of a Generating Unit designated by the CAISO. Black Start Generating Units:~~

- ~~(a) — must be located in the CAISO Balancing Authority Area;~~
- ~~(b) — may be located anywhere in the CAISO Balancing Authority Area provided that the Black Start resource is capable of meeting the CAISO performance requirements for starting and interconnection to the CAISO Controlled Grid; but~~
- ~~(c) — must be dispersed throughout the CAISO Balancing Authority Area.~~

~~8.2.3.4.2 — Black Start Services~~

- ~~(a) — All Participating Generators with Black Start Generating Units must satisfy technical requirements specified by the CAISO.~~
- ~~(b) — The CAISO shall from time to time undertake performance tests, with or without prior notification.~~
- ~~(c) — The CAISO shall have the sole right to determine when the operation of Black Start Generating Units is required to respond to conditions on the CAISO Controlled Grid.~~
- ~~(d) — If the CAISO has intervened in the market for Energy and/or Ancillary Services pursuant to Section 7.7.4, the price paid by the CAISO for Black Start services shall be sufficient to permit the relevant Participating Generator to recover its costs over the period that it is directed to operate by the CAISO.~~
- ~~(e) — If a Black Start Generating Unit fails to achieve a Black Start when called upon by the CAISO, or fails to pass a performance test administered by the CAISO, the Market Participant that has contracted to supply Black Start service from the Generating Unit shall re-pay to the CAISO any reserve payment(s) that it has received since the administration of the last performance test or the last occasion upon which it successfully achieved a Black Start when called upon by the CAISO, whichever is the shorter period.~~

* * * *

8.3.1 Procurement of Ancillary Services

The CAISO shall operate competitive Day-Ahead and Real-Time Markets to procure Ancillary Services. The Security Constrained Unit Commitment (SCUC) and Security Constrained Economic Dispatch (SCED) applications used in the Integrated Forward Market (IFM) and the Real-Time Market (RTM) shall calculate optimal resource commitment, Energy, and Ancillary Services Awards and Schedules at least cost to End-Use Customers consistent with maintaining System Reliability. Any Scheduling Coordinator representing resources, System Units, Participating Loads, Proxy Demand Resources or imports of System Resources may submit Bids into the CAISO's Ancillary Services markets provided that it is in possession of a current certificate for the resources concerned. Regulation Up, Regulation Down, and Operating Reserves necessary to meet CAISO requirements not met by self-provision will be procured by the CAISO as described in this CAISO Tariff. The amount of Ancillary Services procured in the IFM is based on the CAISO Forecast Of CAISO Demand and the forecasted intertie schedules in the RTM for the Operating Hour net of (i) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services and (ii) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The amount of additional Ancillary Services procured in the RTM is based on the CAISO Forecast Of CAISO Demand, the Day-Ahead Schedules established net interchange, and the forecast of the Intertie Schedules for the Operating Hour in the RTM net of (i) available awarded Day-Ahead Ancillary Services, (ii) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services, and (iii) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The amount of Ancillary Services procured in the Real-Time Market is based upon the CAISO Forecast Of CAISO Demand and the net interchange for the Operating Hour from FMM Schedules net of (i) available awarded Day-Ahead Ancillary Services, (ii) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services, (iii) additional Operating Reserves procured in the FMM, and (iv) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The CAISO may procure

incremental Ancillary Services in the Real-Time Market based in part on a determination during the FMM that any Ancillary Services capacity awarded or self-provided in the Day-Ahead Market is not available as a result of a resource constraint or Transmission Constraints. Resource constraints may include but are not limited to an Outage of a resource or Ramp Rate constraints. Incremental procurement in the Real-Time Market will exclude Ancillary Services Capacity the CAISO has determined is not available.

The CAISO will manage the Energy from both CAISO-procured and Self-Provided Ancillary Services as part of the FMM and Real-Time Dispatch. In the Day-Ahead Market, the CAISO procures one-hundred (100) percent of its Ancillary Service requirements based on the Day-Ahead Demand Forecast net of Self-Provided Ancillary Services. After the Day-Ahead Market, the CAISO procures additional Ancillary Services needed to meet system requirements from all resources in the Real-Time Market. The amount of Ancillary Services procured in the Real-Time Market is based on the CAISO Forecast Of CAISO Demand for the Operating Hour net of Self-Provided Ancillary Services.

Awards of AS in the RTM to Non-Dynamic System Resources are for the entire next Operating Hour. The CAISO procurement of Ancillary Services from all other resources in the Real-Time Market is for a fifteen (15) minute FMM interval. The CAISO's procurement of Ancillary Services from Non-Dynamic System Resources, Dynamic System Resources and internal Generation (which includes Generation from Generating Units that are Pseudo-Ties to the CAISO Balancing Authority Area) in the Real-Time Market is based on the Ancillary Service Bids submitted or generated in the RTM consistent with the requirements in Section 30. The CAISO may also procure Ancillary Services pursuant to the requirements in Section 42.1 and as permitted under the terms and conditions of a Reliability Must-Run Contract.

The CAISO will contract for long-term Voltage Support service with owners of Reliability Must-Run Units under Reliability Must-Run Contracts. ~~The CAISO will procure Black Start capability through individual contracts with Scheduling Coordinators for Reliability Must-Run Units and other Generating Units that have Black Start capability.~~ These requirements and standards apply to all Ancillary Services whether self-provided or procured by the CAISO.

* * * *

8.3.4 Certification and Testing Requirements

The owner of and Scheduling Coordinator for each resource for which a Bid to provide Ancillary Services or Submission to Self-Provide Ancillary Services is allowed under the CAISO Tariff, and all other System Resources that are allowed to submit a Bid to provide Ancillary Services under this CAISO Tariff, must comply with the CAISO's certification and testing requirements as contained in Appendix K and the CAISO's Operating Procedures. Each resource used to bid Regulation or used to self-provide Regulation must have been certified and tested by the CAISO using the process defined in Part A of Appendix K. Each Dynamic System Resource offering Regulation must comply with the Dynamic Scheduling Protocol in Appendix M. Spinning Reserve may be provided only from resources that have been certified and tested by the CAISO using the process defined in Part B of Appendix K. Non-Spinning Reserve may be provided from resources that have been certified and tested by the CAISO using the process defined in Part C of Appendix K. ~~Black Start capability may only be provided from Generating Units that have been certified and tested by the CAISO using the process defined in Part E of Appendix K.~~ CAISO certification to provide Ancillary Services may be revoked by the CAISO under the provisions of this CAISO Tariff, including Appendix K.

8.3.5 Daily and Hourly Procurement

The CAISO shall procure Regulation Up, Regulation Down, Spinning Reserve, and Non-Spinning Reserve on a daily and Real-Time basis in the IFM and RTM, respectively. The CAISO shall procure Ancillary Services on a longer-term basis pursuant to Section 42.1.3 if necessary to meet Reliability Criteria. The CAISO shall contract for Voltage Support annually (or for such other period as the CAISO may determine is economically advantageous) and on a daily or hourly basis as required to maintain System Reliability. ~~The CAISO shall contract annually (or for such other period as the CAISO may determine is economically advantageous) for Black Start Generation.~~

* * * *

8.4.2 Ancillary Service Control Standards

The providers of Ancillary Services under this Tariff must comply with the following control standards:

- (a) Regulation. The Area Control Error will be calculated by the CAISO Energy Management System. Control signals will be sent from the CAISO EMS to raise or lower the output of resources providing Regulation when ACE exceeds the allowable CAISO Balancing Authority Area dead band for ACE;
- (b) Spinning Reserve and Non-Spinning Reserve. Each provider of Spinning Reserve or Non-Spinning Reserve must be capable of receiving a Dispatch Instruction within one (1) minute from the time the CAISO Control Center elects to Dispatch the Spinning Reserve resource or Non-Spinning Reserve resource and must ensure that its resource can be at the Dispatched operating level within ten (10) minutes after issuance of the Dispatch Instruction; and
- (c) Voltage Support. Generating Units providing Voltage Support must have automatic voltage regulators which can correct the bus voltages to be within the prescribed Voltage Limits and within the machine capability in less than one (1) minute; and
- ~~(d) Black Start. (i) Voice Communications: each supplier of Black Start capability must ensure that normal and emergency voice communications are available to permit effective Dispatch of the Black Start capability; (ii) CAISO Confirmation: No Load served by the Black Start Generating Unit or by any designated Generating Unit or by any transmission facility used for Black Start service may be restored until the CAISO has confirmed that the need for such service has passed.~~

8.4.3 Ancillary Service Capability Standards

The providers of Ancillary Services under this CAISO Tariff must comply with the following capability standards for :-

- ~~(a)~~ Spinning Reserve and Non-Spinning Reserve Capability. Each resource or external import of a System Resource scheduled to provide Spinning Reserve and each resource providing Non-Spinning Reserve must be capable of converting the full capacity reserved to Energy production within ten (10) minutes after the issue of the Dispatch Instruction by the CAISO-. Each resource scheduled to provide

Spinning Reserve and each resource scheduled to provide Non-Spinning Reserve must be capable of maintaining that output or scheduled Interchange for at least thirty (30) minutes from the point at which the resources reaches its award capacity.

~~(b) — Black Start. Each Black Start Generating Unit must be able to start up with a dead primary and station service bus within ten (10) minutes of issue of a Dispatch Instruction by the CAISO requiring a Black Start. Each Black Start Generating Unit must provide sufficient reactive capability to keep the energized transmission bus voltages within emergency Voltage Limits over the range of no load to full load. Each Black Start Generating Unit must be capable of sustaining its output for a minimum period of twelve (12) hours from the time when it first starts delivering Energy.~~

* * * *

8.4.6 Metering Infrastructure

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~~**8.4.6.1 Additional Requirements for Black Start Units**~~

~~A Participating Generator who wishes to offer Black Start must ensure that the requirements set out in Appendix D are met in relation to the Generating Units from which Black Start will be offered.~~

* * * *

8.8 [Not Used] Black Start

- ~~(a) — Black Start shall meet the standards specified for Black Start in this CAISO Tariff and Appendix K; and~~
- ~~(b) — the CAISO will dispatch Black Start Generating Units as required in accordance with the applicable Black Start agreement.~~

* * * *

8.9.5 ~~**[Not Used] Compliance Testing for Black Start**~~ The CAISO may test the Black Start capability of a Generating Unit by unannounced tests, which may include issuing Dispatch Instructions to start and synchronize the resource, testing of all communications circuits, simulating switching needed to connect the Black Start Generating Unit to the transmission system, and testing the features unique to each facility that relate to Black Start service.

* * * *

8.9.13 ~~**[Not Used] Performance Audit for Black Start**~~ The CAISO will audit the performance of a Black Start Generating Unit by analysis of Meter Data and other records to determine that the performance criteria relating to the Black Start from that Black Start Generating Unit were met when required.

* * * *

8.10.5 ~~**[Not Used] Black Start**~~

The CAISO may test the Black Start capability of a Generating Unit by issuing unannounced Dispatch Instructions requiring the Generating Unit to start on a Black Start basis. The CAISO shall measure the response of the Generating Unit to determine compliance with the terms of the Black Start contract. The Scheduling Coordinator or Black Start Generator as stated in Section 11.10.1.5 for the Generating Unit shall be paid the Generating Unit's contract price for the output under the Black Start test.

* * * *

11.4 ~~**Black Start Settlements [Not Used]**~~

Payments for Black Start capability shall consist of any payments under any Black Start Agreement. If the Energy price and Start-Up Costs are not specified in the Black Start Agreement, the Black Start Energy will be paid as an Exceptional Dispatch in accordance with Section 11.5.6.1 and the resource will

be entitled to Bid Cost Recovery. Black Start Energy resulting from a performance test shall also be paid as an Exceptional Dispatch in accordance with Section 11.5.6.1. RMR Units providing Black Start are compensated in accordance with the RMR Contract rather than this Section 11.4.

11.4.1 Black Start Energy [Not Used]

The Black Start Energy payment user rate for any Settlement Period will be calculated based on the sum of Black Start Energy payments to Scheduling Coordinators in the applicable Settlement Period divided by Measured Demand, excluding exports to neighboring Balancing Authority Areas. The Black Start Energy user charge for any Settlement Period for a Scheduling Coordinator will be the Black Start Energy payment user rate multiplied by the quantity of Measured Demand, excluding exports to neighboring Balancing Authority Areas, for which that Scheduling Coordinator is responsible in that Settlement Period.

11.4.2 Black Start Capability [Not Used]

The CAISO shall allocate payments for Black Start capability under a Black Start Agreement as Reliability Services Costs to the Participating Transmission Owner in whose Service Area where the Black Start Unit is located.

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11.5.6 Settlement Amounts ~~F~~or RTD IIE From Exceptional Dispatch

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11.5.6.5 Settlement of RTD IIE from Black Start

Unless otherwise specified in a Black Start Agreement, All RTD IIE Settlement Amounts associated with Black Start receive the Exceptional Dispatch Settlement price as provided in Section 11.5.6.1, but the costs are allocated pursuant to Section 11.~~410.8~~.

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11.10.1 Settlements for Contracted Ancillary Services

* * * *

11.10.1.5 ~~[Not Used] Black Start~~

~~The total payments for each Scheduling Coordinator for Black Start shall consist of any payments under any long-term contracts due for the Settlement Period. If the Energy price and Start-Up Costs are not specified in the long-term contract, the Black Start Energy will be paid as an Exceptional Dispatch in accordance with Section 11.5.6.1 and the resource will be entitled to Bid Cost Recovery. RMR Units providing Black Start are compensated in accordance with the RMR Contract rather than this Section 11.10.1.5.~~

* * * *

11.10.2 Settlement ~~F~~or User Charges ~~F~~or Ancillary Services

The CAISO shall determine a separate hourly user rate for Regulation Down Reserve, Regulation Up Reserve, Spinning Reserve, and Non-Spinning Reserve purchased for each Settlement Period. The hourly user rates for Regulation Down, Regulation Up, Spinning Reserve, and Non-Spinning Reserve include the cost incurred by the CAISO across the Day-Ahead Market and the Real-Time Market to procure this service. In computing the user rate for each service the quantity (MW) and costs of any substituting Ancillary Service will be treated as if they are costs and MW associated with the Ancillary Service need they are being used to fulfill. Each rate will be charged to Scheduling Coordinators on a volumetric basis applied to each Scheduling Coordinator's obligation for the specific Ancillary Service concerned which it has not self-provided, as adjusted by any Inter-SC Trades of Ancillary Services. Each Scheduling Coordinator's obligation for Regulation Down Reserve, Regulation Up Reserve, Spinning Reserve, and Non-Spinning Reserve shall be calculated in accordance with this Section 11.10.2, notwithstanding any adjustment to the quantities of each Ancillary Service purchased by the CAISO in accordance with Section 8.2.3.5. ~~The cost of Voltage Support and Black Start shall be allocated to Scheduling Coordinators as described in Sections 11.10.7 and 11.10.8.~~

[The remainder of Section 11.10.2 is omitted as there are no additional changes]

* * * *

~~**11.10.8 [Not Used] Black Start** The Black Start Energy payment user rate for any Settlement Period will be calculated based on the sum of Black Start Energy payments to Scheduling Coordinators paid in accordance with Section 11.10.1.5, including any Exceptional Dispatch Instructed Imbalance Energy payments for Black Start, in the applicable Settlement Period divided by Measured Demand, excluding exports to neighboring Balancing Authority Areas and excluding Demand within an MSS except as provided by Section 4.9.4.5.~~

~~The Black Start Energy user charge for any Settlement Period for a Scheduling Coordinator will be the Black Start Energy payment user rate multiplied by the quantity of Measured Demand, excluding exports to neighboring Balancing Authority Areas and excluding Demand within an MSS except as provided by Section 4.9.4.4, for which that Scheduling Coordinator is responsible in that Settlement Period.~~

* * * *

11.27 Voltage Support ~~and Black Start~~ Charges

The CAISO shall calculate, account for and settle charges and payments for Voltage Support ~~and Black Start~~ as set out in Sections 11.10.1.4, ~~11.10.1.5~~, 11.10.7, ~~11.10.8~~, and the applicable Business Practice Manual.

* * * *

- Ancillary Services (AS)

Regulation, Spinning Reserve, Non-Spinning Reserve, and Voltage Support ~~and Black Start together~~ with such other interconnected operation services as the CAISO may develop in cooperation with Market Participants to support the transmission of Energy from Generation resources to Loads while maintaining reliable operation of the CAISO Controlled Grid in accordance with WECC standards and Good Utility Practice.

* * * *

- Black Start Generating Unit

A Generating Unit under a system restoration plan for the PTO or CAISO and providing Black Start service under a Black Start Agreement.

* * * *

- Black Start Generator

A Participating Generator in its capacity as party to an ~~Interim~~ Black Start Agreement with the CAISO for the provision of Black Start services, but shall exclude Participating Generators in their capacity as providers of Black Start services under their Reliability Must-Run Contracts.

* * * *

~~- Interim Black Start Agreement~~

An agreement entered into between the CAISO, a Participating Transmission Owner, and a Participating Generator (other than a Reliability Must-Run Contract) for the provision by the Participating Generator of Black Start capability and Black Start Energy ~~on an interim basis until the introduction by the CAISO of its Black Start auction (or until terminated earlier by either party in accordance with its terms).~~

* * * *

- Reliability Services Costs

The costs associated with services provided by the CAISO: 1) that are deemed by the CAISO as necessary to maintain reliable electric service in the CAISO Balancing Authority Area; and 2) whose costs are billed by the CAISO to the Participating TO pursuant to the CAISO Tariff. Reliability Services Costs include costs charged by the CAISO to a Participating TO associated with service provided under a Reliability Must-Run Contract, or a Black Start Agreement, as well as Exceptional Dispatches and Minimum Load Costs associated with units committed for local reliability requirements.

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Appendix D

Black Start Generating Units

The following requirements must be met by Black Start Generating Units ~~providing Black Start~~:

- (a) Black Start Generating Units must be capable of starting and paralleling with the CAISO Controlled Grid without aid from the CAISO Controlled Grid;
- (b) Black Start Generating Units must be capable of making a minimum number of starts per event (to be without aid from the CAISO Controlled Grid as determined by the CAISO);
- (c) Black Start Generating Units must be equipped with governors capable of operating in the stand alone (asynchronous) and parallel (synchronous) modes.
- (d) Black Start Generating Units must have Start-Up load pickup capabilities at a level to be determined by the CAISO, including total Start-Up load (MW) and largest Start-Up load (MW) for such power output levels as the CAISO may specify. Each Black Start Generating Unit must be able to start up with a dead primary and station service bus within ten (10) minutes of issuance of an Exceptional Dispatch by the CAISO requiring a Black Start. Each Black Start Generating Unit must be capable of sustaining its output for a minimum period of twelve (12) hours from the time when it first starts delivering Energy. Black Start Agreements may specify a different minimum period.
- (e) All Black Start Generating Units must be capable of producing reactive Power (boost) and absorbing reactive Power (buck) as required by the CAISO to control system voltages. Each Black Start Generating Unit must provide sufficient reactive capability to keep the energized transmission bus voltages within emergency Voltage Limits over the range of no load to full load. This requirement may be met by the operation of more than one Black Start Generating Unit in parallel providing that:
 - (i) the Black Start Generation supplier demonstrates that the proposed Generation resource shares reactive burden equitably;
 - (ii) all Participating Generators associated with the proposed Black Start source are located in the same general area.

Buck/boost capability requirement shall be dependent on the location of the proposed resource in relation to Black Start load.

- (f) All Black Start Generating Units must have the following communication/control requirements:
 - (i) dial-up telephone;
 - (ii) backup radio;
 - (iii) manning levels which accord with Good Utility Practice.
 - (iv) Each Black Start Generator must ensure that normal and emergency voice communications are available to permit effective Exceptional Dispatch of Black Start Generating Units.

- (g) The Scheduling Coordinator for the Black Start Generating Unit shall not use the Black Start Generating Unit to serve any Load other than station service Load required by the Black Start Generating Unit until the CAISO has confirmed that the need for such Black Start service has passed.
- (h) Black Start Generating Units must pass performance tests for demonstrating Black Start capability, which the CAISO may periodically undertake in accordance with the CAISO's Operating Procedures for Black Start testing.
- (i) All Black Start Generating Units will comply with Applicable Reliability Criteria.

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Appendix K Ancillary Service Requirements Protocol (ASRP)

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PART E

~~NOT USED~~CERTIFICATION FOR BLACK START

- ~~E 1~~ — A Generator wishing to provide Black Start capacity from a Generating Unit as an Ancillary Service must meet the requirements stated in Appendix D of the CAISO Tariff in order to be certified by the CAISO to provide Black Start capacity. In addition, the Generating Unit must have a rated capacity 1 MW or greater unless the Generating Unit is participating in an aggregation arrangement approved by the CAISO.
- ~~E 2~~ — A Generator wishing to be considered for certification for Black Start service by the CAISO must make a written request to the CAISO. Such request must clearly identify the facilities related to the Generating Unit from which the Generator wishes to provide Black Start and shall identify the Scheduling Coordinator through whom the Generator wishes to offer Black Start service. The Generator shall send a copy of its request to its Scheduling Coordinator at the same time as it sends it to the CAISO. The Generator's written request must include at least the following:
 - ~~E 2.1~~ — identification of the Generating Unit including Location Code;
 - ~~E 2.2~~ — a single-line electrical diagram of the Generating Unit connections including auxiliary power busses and the connection to the station switchyard;
 - ~~E 2.3~~ — a description of the fuel supply used for Black Start including on-site storage and resupply requirements;
 - ~~E 2.4~~ — a single-line electrical diagram showing the transmission connection from the Generating Unit station switchyard to a connection point on the CAISO Controlled Grid;
 - ~~E 2.5~~ — a description of the Generating Unit capability to provide both real and reactive power, any Start-Up and Shut-Down requirements, any staffing limitations; and

- ~~E 2.6~~ a description of the primary, alternate and emergency back-up communications systems currently available to the Generator for communications to the CAISO Control Center.
- ~~E 3~~ Upon receipt of the Generator's written request the CAISO shall review the information provided and respond in writing within two weeks of receipt of the request, providing a copy of its response to the Generator's Scheduling Coordinator. The CAISO response may be any of the following:
- ~~E 3.1~~ acceptance of the proposal as presented;
- ~~E 3.2~~ rejection of the proposal as presented with a rationale for such rejection; or
- ~~E 3.3~~ a request for additional information needed by the CAISO to properly evaluate the request.
- ~~E 4~~ A Generator receiving a rejection may submit a written request for reconsideration by the CAISO within 60 days of the date of the rejection notice. A request for reconsideration must address the rationale provided by the CAISO. The CAISO shall respond to a request for reconsideration within 60 days of the date of that request.
- ~~E 5~~ A Generator receiving a request for additional information shall provide such information within 60 days of such request providing a copy at the same time to its Scheduling Coordinator. The CAISO shall review the information and respond within 120 days of the date of the CAISO's request for additional information providing a copy at the same time to the Generator's Scheduling Coordinator.
- ~~E 6~~ Upon acceptance by the CAISO of the Generator's request and agreement as to the method of communication and control to be used by the Generator, the CAISO shall provisionally approve the proposal in writing providing a copy at the same time to the Generator's Scheduling Coordinator. The Generator may then proceed to procure and install the equipment and make arrangements for the required communication.
- ~~E 7~~ Design, acquisition, and installation of the Generator's equipment shall be under the control of the Generator. The CAISO shall bear no cost responsibility or functional responsibility for such equipment. The CAISO shall be responsible for the design, acquisition and installation of any necessary modifications to its own equipment at its own cost.
- ~~E 8~~ The Generator shall perform its own testing of its equipment to ensure that the Black Start system performs to meet the CAISO requirements.
- ~~E 9~~ When it is satisfied that its plant, equipment and communication systems meet the CAISO's requirements, the Generator shall request in writing that the CAISO conduct a certification test with a suggested primary date and time and at least two alternative dates and times. The CAISO shall, within two Business Days of receipt of the Generator's request, accept a proposed time if possible or suggest at least three alternatives to the Generator. If the CAISO responds by suggesting alternatives, the Generator shall, within two Business Days of receipt of the CAISO's response, respond in turn by accepting a proposed alternative if possible or suggesting at least three alternatives, and this procedure shall continue until agreement is reached on the date and time of the test. The Generator shall inform its Scheduling Coordinator of the agreed date and time of the test.

- ~~E 10~~ Testing shall be performed under the direction of the CAISO. Such tests shall include, but not be limited to, the following:
- ~~E 10.1~~ confirmation of control communication path performance;
 - ~~E 10.2~~ confirmation of primary, secondary, and emergency voice circuits for receipt of Dispatch Instructions;
 - ~~E 10.3~~ confirmation of the Generating Unit performance; and
 - ~~E 10.4~~ simulation of a Black Start event.
- ~~E 11~~ Upon successful completion of the test, the CAISO shall certify the Generating Unit as being permitted to provide Black Start capacity as an Ancillary Service and shall provide a copy of the certificate to the Scheduling Coordinator at the same time. The CAISO shall change its Generating Unit data base to reflect the permission for the Generating Unit to provide Black Start service.
- ~~E 12~~ The certification to provide Black Start shall remain in force until withdrawn by the Scheduling Coordinator or the Generator by written notice to the CAISO to take effect at the time noticed in the notice, which must be the end of a Trading Day.
- ~~E 13~~ The certification may be revoked by the CAISO only under provisions of the ASRP or other provisions of the CAISO Tariff.

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