



Black Start and System Restoration Phase 2

Issue Paper

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Black Start and System Restoration

1 Introduction and Background

The purpose of this paper is to explore the current practice regarding the procurement and compensation for black start services, in light of the need for additional black start capability. This includes examining how resources are selected and procured, and how cost allocation for these resources would take place. Today, based on NERC reliability standard EOP-005-2 transmission operators must have approved plans for system restoration following widespread outages. Based on the ISO's review of the timelines associated with the ISO and utilities' system restoration times, the ISO has concluded that, in order to provide reasonably consistent service with other major centers in the state, additional black start resources are required in the greater San Francisco Bay area. To secure this additional capability, the ISO needs to adopt an appropriate selection and procurement process. In addition, while the incremental cost for the provision of this service is relatively small compared to the overall cost of electricity supply, fair cost allocation is an important consideration.

Pursuant to NERC Reliability Standard EOP-005-2, a transmission operator must have a restoration plan approved by its Reliability Coordinator.¹ System restoration plans must be submitted to the Reliability Coordinator on an annual basis. The ISO currently has an approved system restoration plan. The ISO tariff requires the ISO to determine the amount and location of black start generation it requires through a system restoration plan that meets the requirements of applicable reliability criteria.² This plan draws from and considers the system restoration plans of participating transmission owners. The ISO may, however, identify black start generation needs for the ISO system not identified in participating transmission owners' system restoration plans.³

¹ See Requirement 1 of NERC Reliability Standard 005—2 available at the following website: http://www.nerc.com/_layouts/PrintStandard.aspx?standardnumber=EOP-005-2&title=System%20Restoration%20from%20Blackstart%20Resources

² Section 8.2.3.4 of the ISO tariff provides:

The ISO 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 ISO shall consult with Participating Transmission Owners.

³ For more background information, refer to the ISO's 2012 Stakeholder Black Start initiative available on the ISO website: http://www.caiso.com/informed/Pages/StakeholderProcesses/CompletedStakeholderProcesses/Blackstart_SystemRestoration.aspx

Currently, all black start resources relied upon in the participating transmission owners and ISO's restoration plans are either owned by the utility, or under contract with the utility through a power purchase arrangement. The ISO understands utilities currently recover the costs for this black start capability through their bundled customer retail rates. Generation resources providing black start capability under the ISO's system restoration plan are currently subject to a three party agreement between the ISO, the applicable PTO and the generator. These contracts have a zero price term for back start capability. However, the ISO has tariff authority to enter into black start contracts that could provide a non-zero price term.⁴ The tariff states that for the provision of black start service, if the energy price and start-up costs are not specified in a long-term contract for black start service, the black start energy will be paid as an exceptional dispatch and entitled to bid cost recovery.⁵ The ISO's tariff also provides that scheduling coordinators should pay for this capability.⁶

2 Additional Procurement and Cost Allocation

The ISO plans to modify its system restoration plan to ensure adequate restoration of load on a comparable basis where needs have been identified. These modifications will require securing additional black start capability and considering appropriate cost allocation rules. Transmission operators within the ISO currently rely on black start capability from their utility-owned or contracted resources. This capability provides service to the ISO system. The ISO understands that the investor owned utilities recover the cost of providing this capability through retail rates charged to bundled service customers. The ISO has identified additional black start needs that will likely require procurement of black start capability from independently owned generating resources in the Greater Bay Area. Any such procurement would benefit all transmission customers in the area, yet may not result in the allocation of costs to all transmission customers if procured by the investor owned utility. For instance, non-bundled customers taking service from a community choice aggregator, Electric Service Provider, or municipal utility in the area that rely on the black start capability may not face any cost allocation.

3 Considerations for this initiative

In developing a system restoration plan to comply with EOP-005-2, the ISO incorporated resources identified by transmission operators in its balancing authority area into a single plan. Based on a recent review of calculated system restoration times, the ISO has determined it is necessary to secure additional black start capability to ensure an adequate level of black start service exists across its balancing authority area. The analysis performed by the ISO showed that since the black start resources in southern

⁴ See ISO tariff section 8.3.1.

⁵ *Id.* at section 11.10.1.5.

⁶ *Id.* at sections 11.10.2 and 11.10.8.

California are more evenly distributed near major load centers, these areas have a more expedient restoration than the Greater Bay Area which relies on remote resources.

While there is no national standard currently in place setting requirements for the time to restore service following a major outage on the transmission system, additional black start capability in the Greater Bay Area is necessary to ensure the ISO can restore service across major urban centers throughout California in a comparable amount of time. The ISO planning standards define higher levels of planning service for two areas, “Planning for High Density Urban Load Centers Standard”, and the “Extreme Event Reliability Standard”. The Extreme Event Reliability Standard focuses on planning requirements following a San Francisco-Peninsula Extreme Event but other areas could be added to in the future. The Planning for High Density Urban Load Centers Standard does not accept firm load shedding as a mitigation for NERC TPL-001-4 P1-P7 planning events for high density load areas. However, neither of these planning standards address restoration times.

Selection and procurement

Acquiring new black start resources raises a number of questions relating to selection and procurement. The selection of resources depends on their specific location and electrical connection implications, severely impacting market power concerns. Based on its engineering assessments, the ISO is aware of a relatively small set of generation resources in the Greater Bay Area that are available to meet the identified need and the procurement process should reflect and be appropriate for these circumstances. These resources will likely need to invest in capital improvements to provide black start capability. To this end, the ISO expects black start resource contracts to reflect a multi-year term. The ISO seeks comment on the process for selecting and procuring additional black start capability, and the role of the ISO and the investor owned utilities in that process.

Cost allocation

In securing additional black start capability, the ISO must consider how to allocate the costs of this capability. Two approaches are to consider incremental procurement as part of a broader system need or as a local need with the transmission access charge (TAC) area of a transmission operator where the black start resource is located. As a point of reference, various mechanisms exist for cost allocation treatment of transmission related services and reliability related services today. For example, the following cost allocation approaches are included in the existing ISO tariff:

1. Black start costs incurred by the ISO specifically for black start service are recovered on a system-wide basis.
2. Transmission wire costs under ISO operational control:
 - Greater than 200 kV are recovered from all ISO load and exports on a \$/MWh basis.
 - Less than 200 kV are recovered only from the local TAC area load and relevant exports.

3. Reliability Must Run costs incurred by the ISO – as part of Reliability Services - are recovered through applicable participating transmission owner’s reliability services tariff.
4. For a collective deficiency of local capacity area resources in an annual resource adequacy plan, the capacity procurement mechanism costs (see tariff section 43) are allocated to all scheduling coordinators of load serving entities serving load in the TAC area in which the deficient local capacity area was located.
5. For a significant event exceptional dispatch, or resource at risk of retirement capacity procurement mechanism, the costs are allocated to all scheduling coordinators for load serving entities serving load in the TAC area where the need for the designation arose, based on each scheduling coordinator’s percentage of actual load in the TAC area to total load in that area.
6. Costs are also allocated on a metered demand basis by custom Load Aggregation Point (LAP) such as Unaccounted for Energy (UFE) and emissions charges.

The fundamental principle at play in these cost allocation approaches is that the beneficiaries should pay at least a share of the costs of the services from which they are benefiting. Within that context, there is considerable room for a range of legitimate options depending on the circumstances and local preferences.⁷ However, the ISO also recognizes that the cost allocation methodology should not be unreasonably burdensome and complex. Also, the ISO believes the level of granularity applied should be reasonable considering how material the costs are, and be consistent with other cost allocation practices for other costs. To this end, the ISO has identified the following possible cost recovery mechanisms:

- The ISO can enter into black start contracts and charge scheduling coordinators under its existing tariff for the incremental black start capability. The ISO’s current

⁷ In 2012, the ISO developed guiding principles for the cost allocation of ISO market costs. Although not all appear relevant here, the cost allocation guiding principles consist of seven elements:

1. **Causation:** Costs will be charged to resources that benefit from the service being procured or to resources that drive the procurement decision.
2. **Comparable treatment:** Market participants with similarly situated resources should receive similar allocation of costs and not be unduly discriminated against.
3. **Accurate price signals:** The cost allocation design supports the economically efficient achievement of state and federal policy goals by providing accurate price signals from the ISO market.
4. **Incentivize behavior:** Cost allocation design should provide appropriate incentives for market participants to take action to reduce costs
5. **Manageable:** Market participants should have the ability to manage exposure to the cost allocation.
6. **Synchronized:** Cost allocation is aligned with the timing and quantity of the service procured.
7. **Rational:** Implementation costs and complexity should not exceed the benefits that are intended to be achieved by allocating costs.

tariff does not contemplate an allocation of black start capability payments to a specific PTO service area. Instead, the tariff suggests that all scheduling coordinators pay for this capability.⁸

- Shift the cost allocation for incremental black start capability to the local TAC areas and require the ISO to recover these costs as Reliability Service Costs from PTOs.

The ISO seeks comments on the appropriate cost allocation approach for the additional black start capability it plans to secure.

Other ISO/RTO practices

A general review of the public documentation of the other ISOs and RTOs in the United States indicated a wide range of practices for the procurement of resources to provide black start services and compensation and cost allocation models. Like the ISO, the other ISOs' practices appear to depend heavily on the black start provisions in place at the time of their creation, with variations depending on specific circumstances. The ISO, however, solicits comments on whether it should consider specific approaches adopted by other ISO/RTOs for the procurement of incremental black start capability and related cost allocation.

4 Stakeholder process

The ISO's 2017 Stakeholder Initiatives Catalog and Roadmap identifies black start and system restoration as a discretionary item and does not provide a timeframe for completing the initiative. The ISO plans to present a proposal developed through this initiative to the Board of Directors at its May 2, 2017 meeting. The proposed schedule for the stakeholder process leading to the Board of Governor's meeting is set forth below.

Date	Milestone
January 17, 2017	Post Issue Paper
January 24, 2017	Stakeholder Call on Issue Paper
January 31, 2017	Comments Due on Issue Paper
February 14, 2017	Post Straw Proposal
February 21, 2017	Stakeholder Call on Straw Proposal
February 28, 2017	Stakeholder Comments Due

⁸ See tariff section 11.10.1.5.

March 14, 2017	Post Draft Final Proposal
March 21, 2017	Stakeholder Call on DFP
April 4, 2017	Stakeholder Comments due on DFP
May 2, 2017	BOARD Meeting.

5 Next steps

The ISO plans to discuss this issue paper with the stakeholders during a stakeholder conference call to be held on January 24, 2017. The ISO requests comments from stakeholders on the proposed scope of this initiative. Stakeholders should submit written comments by January 31, 2017 to initiativecomments@caiso.com.