



California ISO
Shaping a Renewed Future

Greater Bay Area Black Start Technical Specification

May 24, 2016



Topics

- Geographic Area of Consideration
- Selection Factors and Evaluation Criteria
- Black Start Resource Requirements
- Facility Information
- Individual Unit Data
- Analysis Methodology
- Compliance Criteria

Geographic Area

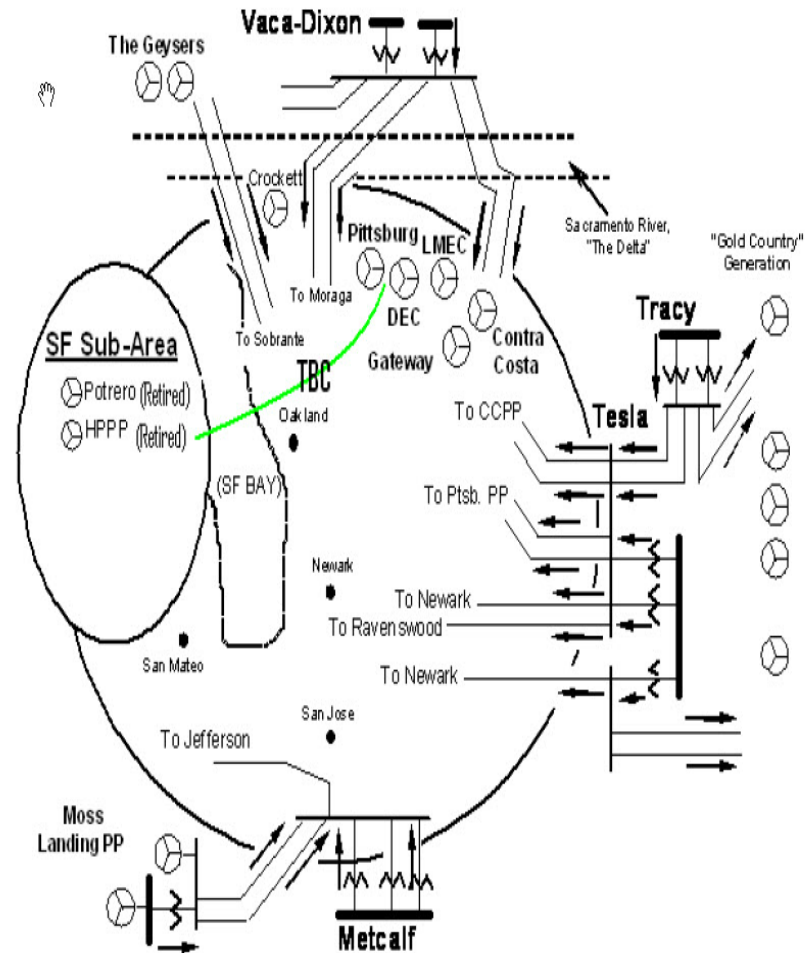
- Goal is to create stable 230kV ring in the Bay Area for faster restoration



Geographic Area – Local Capacity Report Definition

The substations that delineate the Greater Bay Area are:

- 1) Lakeville is out Sobrante is in
- 2) Ignacio is out Crocket and Sobrante are in
- 3) Parkway is out Moraga is in
- 4) Bahia is out Moraga is in
- 5) Lambie SW Sta is in Vaca Dixon is out
- 6) Peabody is out Birds Landing SW Sta is in
- 7) Tesla and USWP Ralph are out Kelso is in
- 8) Tesla and Altmont Midway are out Delta Switching Yard is in
- 9) Tesla and Tres Vaqueros are out Pittsburg is in
- 10) Tesla and Flowind are out Pittsburg is in
- 11) Tesla is out Newark is in
- 12) Tesla is out Newark and Patterson Pass are in
- 13) Tesla is out Ravenswood is in
- 14) Tesla is out Metcalf is in
- 15) Los Banos is out Moss Landing is in
- 16) Coburn is out Moss Landing is in
- 17) Las Aguillas is out Moss Landing is in
- 18) Oakdale TID is out Newark is in
- 19) Oakdale TID is out Newark is in



Selection Factors and Evaluation Criteria

- Calculated time to energize 230kV Backbone
- Technical ability to meet restoration requirements
 - Real, Reactive Power
 - Protective Relaying
 - Ramping, etc
- Restoration Flexibility
- Locational Diversity
- Commencement/ In service date of black start
- Costs
- Probability of completing contract
- Other

Black Start Resource Requirements

- Must be able to satisfy the NERC definition of Blackstart Resource

“ A generating unit(s) and its associated set of equipment which has the ability to be started without support from the System or is designed to remain energized without connection to the remainder of the System, with the ability to energize a bus, meeting the Transmission Operator’s restoration plan needs for Real and Reactive Power capability, frequency, and voltage control, and that has been included in the Transmission Operator’s restoration plan.”

Black Start Resource Requirements

- Must be able to supply own startup power
- Must serve own plant load
- Must be able to modify protective relay settings to meet system requirements during a black start event.
- Must follow the CAISO planned outage procedure(Need to add here)
- Must be able to operate for 48 hours continuously
- Must be able to energize dead transmission bus within 3 hours

Facility Information

- Interconnection Voltage and Location
- Type of unit - Fuel
- Operational Characteristics and Limitations
- Single Line
- General Black Start restoration procedures
- Estimated dead bus restoration time
- Point of Interconnection

Individual Black Start Unit Data - Modeling

- Electrical Characteristics
- Transformer Impedances and Tap settings
- Tie Line impedance
- GE PSLF models
 - Steady state
 - dynamic

Analysis Methodology

- Technical
 - Validate submitted data
 - Map resource and run preliminary steady state analysis.
 - Determine switching requirements/steps to energize Greater Bay Area 230kV back bone.
 - Analysis of dynamic requirements; MW and MVAR capabilities, fault current availability, frequency regulation, ability to energize cranking paths, voltage regulation, operational deadbands, etc.
 - Consideration of restoration flexibility
 - Consideration of locational diversity

Analysis Methodology

- Commercial/ Economic
 - Capital Costs
 - Operating costs – cost of service requirements
 - Schedule for implementation – commencement date
 - Likelihood of completing 5 year contract

Compliance Criteria

- EOP-005-2
- CIP-003 through 009
- CAISO Black Start Resource Testing Requirements

Next Steps – Request for Proposal Schedule

- Issue Black Start Request for Proposal – June 15
- Proposals Due (30 Business Days) – July 31
- ISO proposal validation (10 Business Days)- August 14th
 - Requests for clarification (5 Business Days)
- ISO evaluation (Max of 75 Business Days) – December 1st
- Notify applicants and post final report – December 1st