



2009 CAISO Transmission Plan for Southern California Edison (SCE) Service Area

David Le

Lead Regional Transmission Engineer

2009 CAISO Transmission Plan Stakeholder Meeting

February 27, 2009

Overview of Submitted Projects to the CAISO Through Request Window

- A total of 19 projects were submitted through the Request Window
- 13 projects were submitted by SCE, 1 by Merchant Transmission Company, 1 by an Independent Power Producer as a generation project, 2 by an IPP as transmission projects, and 2 others by Third-Party Transmission Provider
- CAISO Staff recommends ISO Management approval of 9 projects, with 2 needing CAISO Board approval (to be prepared separately from the projects that do not require Board approval)
- CAISO Staff recommends further review on the remaining 10 projects, some of which will require policy review in regards to renewable network transmission and project leasing options for meeting reliability criteria

Projects Recommended for CAISO Management Approval

(1) Barre – Ellis 230kV Line Upgrade Project

Project Proponent

- SCE

Needs

- NERC Category B/C overloads (2013)

Project Scope

-Upgrade terminal equipment at Barre and Ellis Substations

-Modify/upgrade structures in the right of way as required to increase long-term and short-term emergency ratings to 1135 MVA and 1335 MVA, respectively

Costs

- \$1M

Other Considered Alternatives

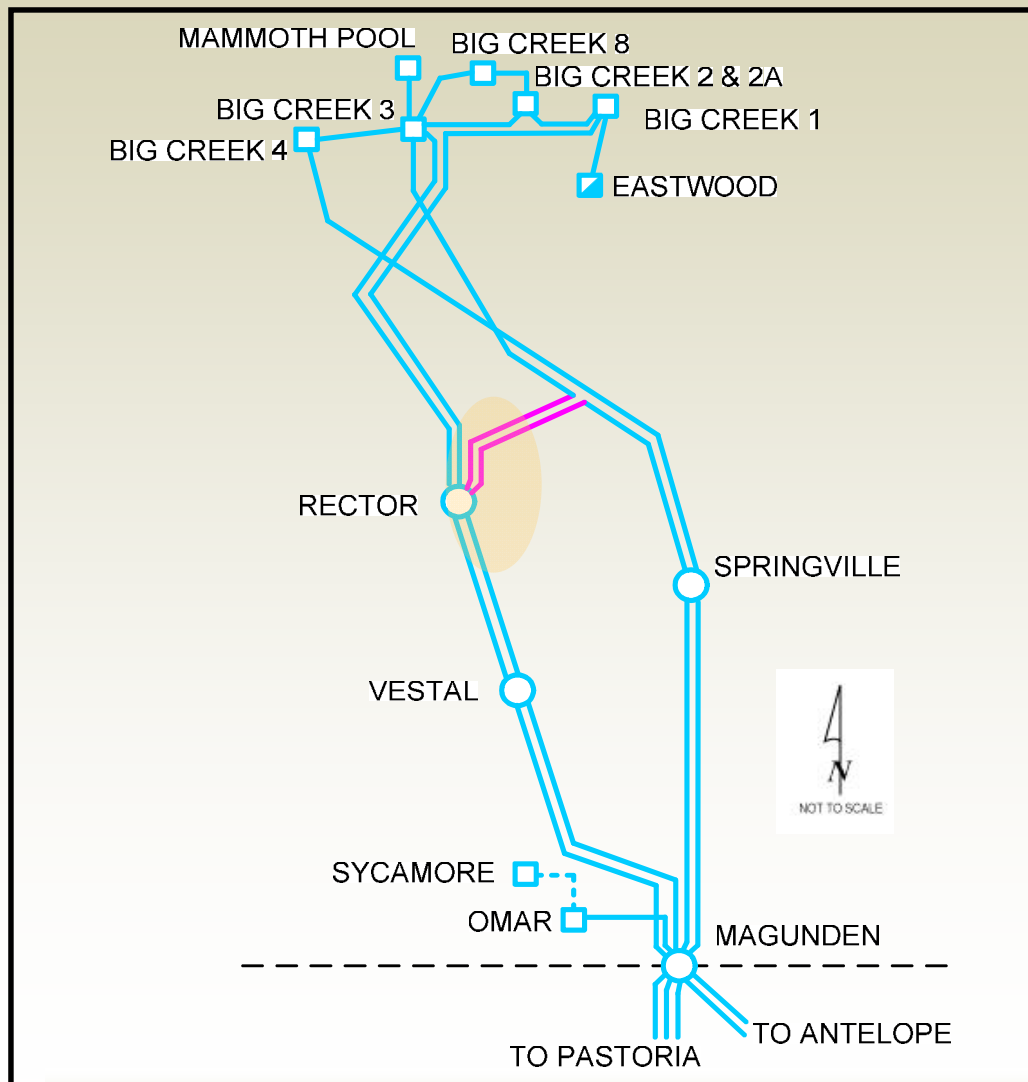
- Re-rate conductor with wind speed higher than 4 ft/sec. (determined to be infeasible)

Expected In-Service

-January 1, 2010

Recommended Action: Approval by CAISO Management

(2) Rector Static VAR System (SVS) Project



Project Proponent

- SCE

Needs

- WECC Performance Levels B & C for Transient Stability Criteria (2013) – transient voltage and frequency dip exceed WECC criteria under N-1 and N-2 contingencies

Project Scope

-Expand Rector SVS with the addition of two 79.2 MVAR MSC and wired to work in conjunction with the existing 200 MVAR SVC at Rector
-Implement fast fault clearing time to 4 cycles under N-1 and N-2 contingency conditions

Costs

- \$7.6 M +25% contingency cost (=\$9.5 M)

Other Considered Alternatives

- Five other transmission alternatives (fast fault clearing + generation tripping; increase SVC size to 600 MVAR; install new 100 MVAR SVC at Rector 66kV; install new generator near Rector; new 500kV line from Rector to Whirlwind)

Expected In-Service

-April 1, 2010

Recommended Action: Approval by CAISO Management

(3) Redondo – La Fresa 230kV Line Upgrade

Project Proponent

- SCE

Needs

- NERC Category C overloads (2018)

Project Scope

-Upgrade terminal equipment at Redondo 230 kV Substation (i.e., circuit disconnects, circuit breakers) to raise its emergency rating to 1613 MVA

Costs

- \$2.7 M

Other Considered Alternatives

- System Protection System (SPS) to drop load (up to 100 MW) under various N-2 contingencies

Expected In-Service

- December 31, 2009

Recommended Action: Approval by CAISO Management

(4) Antelope 66kV Circuit Breaker Upgrade

Tehachapi Renewable Transmission Project Segments 1-3



Project Proponent

- SCE

Needs

- Short circuit duty increase due to addition of the Antelope Transmission Project, affecting thirty-eight 66kV circuit breakers at Antelope Substation (2009)

Project Scope

- Upgrade thirty-eight 66kV circuit breakers with 40kA rated circuit breakers

Costs

- \$7 M +/- 25%

Other Considered Alternatives

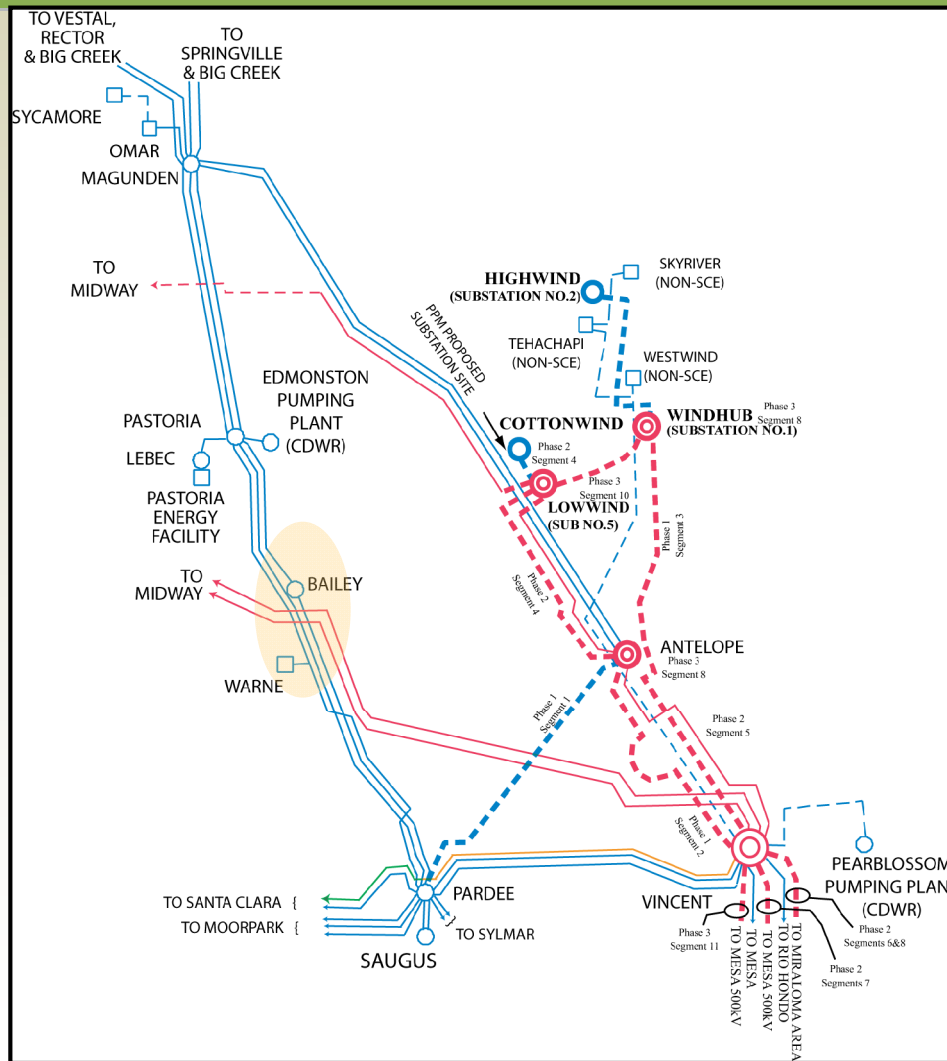
- None (Upgrade of identified deficient circuit breakers is the standard engineering practice at SCE)

Expected In-Service

- December 31, 2009

Recommended Action: Approval by CAISO Management

(5) Bailey 66kV Circuit Breaker Upgrade



Project Proponent

- SCE

Needs

- Short circuit duty increase due to addition of the Antelope Transmission Project, affecting two 66kV circuit breakers at Bailey Substation (2009)

Project Scope

- Upgrade two 66kV circuit breakers with 40kA rated circuit breakers

Costs

- \$0.4 M

Other Considered Alternatives

- None (Upgrade of identified deficient circuit breakers is the standard engineering practice at SCE)

Expected In-Service

- December 31, 2009

Recommended Action: Approval by CAISO Management

(6) Devers 115kV Circuit Breaker Upgrade

Project Proponent

- SCE

Needs

- Short circuit duty increase triggered by changes from the existing generators connecting near Devers Substation, affecting seven 115kV circuit breakers at Devers Substation (2009)

Project Scope

-Upgrade seven 115kV circuit breakers with 40kA rated circuit breakers

Costs

- \$2.5 M +/- 25%

Other Considered Alternatives

- None (Upgrade of identified deficient circuit breakers is the standard engineering practice at SCE)

Expected In-Service

-December 31, 2009

Recommended Action: Approval by CAISO Management

(7) Kramer 115kV Circuit Breaker Upgrade

Project Proponent

- SCE

Needs

- Short circuit duty increase triggered by the addition of a third new 280 MVA 230/115kV at Victor Substation, affecting ten 115kV circuit breakers at Kramer Substation (2009), **four** of which are under CAISO Control

Project Scope

-Upgrade ten 115kV circuit breakers with 40kA rated circuit breakers of which **four** are under CAISO Control

Costs

-\$3.5 M +/- 25% for replacing all 10 CB's (including CAISO/non-CAISO Control)

-OR **\$1.4 M +/- 25% for CAISO Control**

Other Considered Alternatives

- None (Upgrade of identified deficient circuit breakers is the standard engineering practice at SCE)

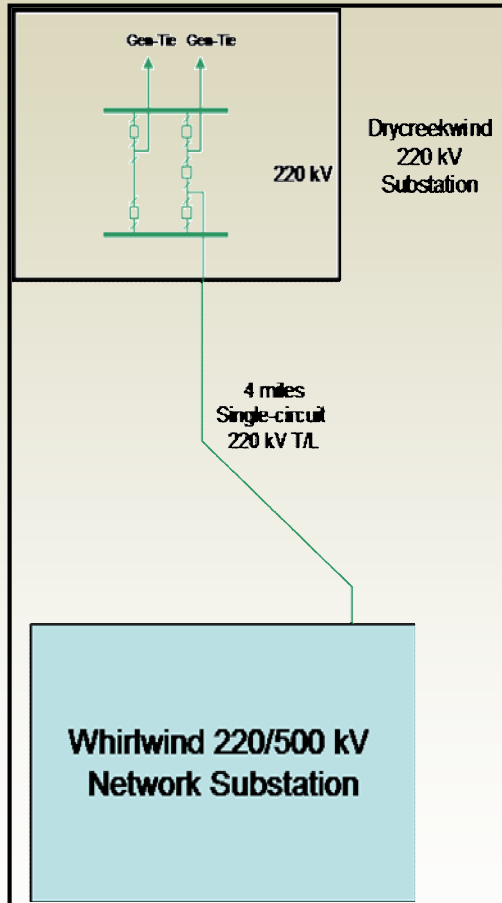
Expected In-Service

-December 31, 2009

Recommended Action: Approval by CAISO Management

Proposed Transmission Projects Recommended for CAISO Board Approval

(8) Drycreekwind Location Constrained Resource Interconnection Facility (LCRIF) Project



Project Proponent: SCE

Needs

- Connecting location-constrained resource interconnection generators (LCRIGs), of which all are renewable generation, in the Tehachapi Wind Resources Area

Project Scope

-Drycreekwind 230kV Substation and 4-mile 230kV transmission line connecting Drycreekwind to Whirlwind 500/230kV Substation. The total capacity for the transmission line is 1,150 MW. At this time, there are two proposed generation projects totaling 550 MW, or consisting 47.8% of the proposed LCRI facility.

Costs

-\$49.8 M (NEEDS CAISO BOARD APPROVAL)

-Annual levelized cost estimate: \$7.95 M

Other Considered Alternatives

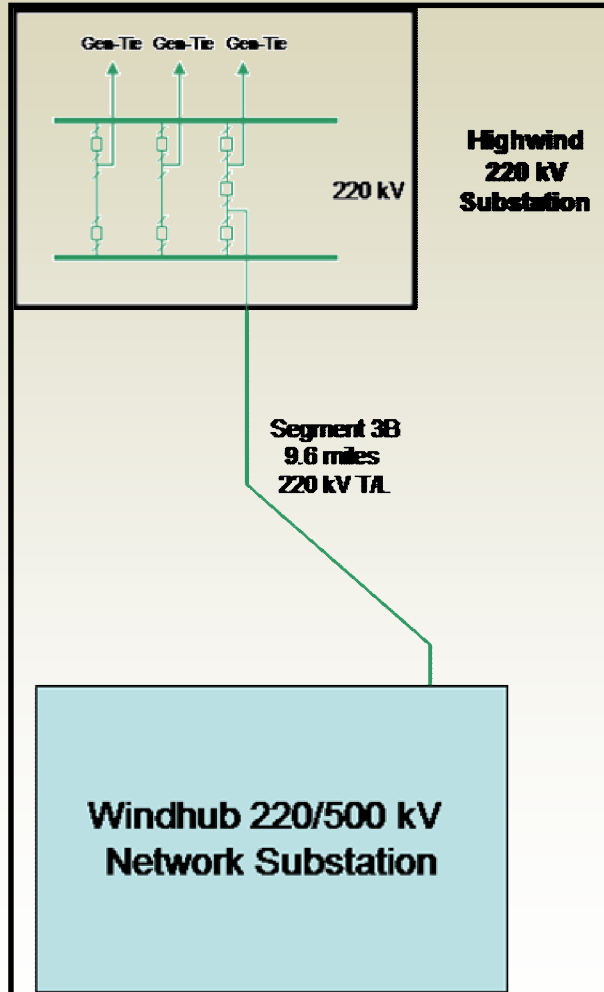
- The proposed project was part of CAISO Board approved Tehachapi Transmission Project, which was approved in January 2007. SCE would like to submit the radial section of the Tehachapi Transmission Project for rate recovery under FERC-approved LCRI Tariff.

Expected In-Service

-Earliest in-service date (Feb. 2010), however, SCE's CPUC environmental filing reflects an in-service date of October 2013.

Recommended Action: ***Conditional approval*** by CAISO Management until commercial interest is demonstrated prior to full approval for construction (60% of the proposed transmission capacity)

(9) Highwind Location Constrained Resource Interconnection Facility (LCRIF) Project



Project Proponent: SCE

Needs

- Connecting location-constrained resource interconnection generators (LCRIGs), of which all are renewable generation, in the Tehachapi Wind Resources Area

Project Scope

-Highwind 230kV Substation and 9.6-mile 230kV transmission line connecting Highwind to Windhub 500/230kV Substation. The total capacity for the transmission line is 1,150 MW. At this time, there are three proposed generation projects totaling 759 MW, or consisting 66% of the proposed LCRI facility.

Costs

-\$46.1 M (NEEDS CAISO BOARD APPROVAL DUE TO CREZs NOT YET OFFICIALLY ENDORSED BY THE STATE ENERGY AGENCIES)

-Annual levelized cost estimate: \$7.36 M

Other Considered Alternatives

- The proposed project was part of CAISO Board approved Tehachapi Transmission Project, which was approved in January 2007. SCE would like to submit the radial section of the Tehachapi Transmission Project for rate recovery under FERC-approved LCRI Tariff.

Expected In-Service

-Earliest commercial in-service date: December 31, 2010

Recommended Action: *Conditional approval* by CAISO Management until commercial interest is demonstrated prior to full approval for construction (60% of total proposed transmission capacity, with 25% having LGIAs, and the rest meeting CAISO Tariff 24.1.3.2)

On-Going Projects/Study Requests

List of On-Going Projects/Study Requests

Project No.	Name of Proposed Project*	Project Sponsor*	Description of Proposed Project	Project Category	Proposed On-Line Date
1	Antelope – Bailey – Windhub System Re-configuration	SCE	Place 4 th transformer in service; split Antelope 66kV bus; re-arrange 66-kV transmission lines	Reliability	Dec. 2011
2	Cal Cement Interim Solution	TTS	Project Proponent wants to propose service contract/lease option for connecting SVC at 66kV subtransmission system in the Tehachapi Area	Reliability	Nov. 2010
3	Alberhill 500./115kV Substation	SCE	Connect new substation to the existing Valley – Serrano 500kV line	Reliability	June 2012

List of On-Going Projects/Study Requests

Project No.	Name of Proposed Project*	Project Sponsor*	Description of Proposed Project	Project Category	Proposed On-Line Date
4	West of Devers 230kV Lines Rebuild	SCE	Rebuild existing 4-230kV lines to mitigate NERC reliability and resolve the Right of Way issue with the Morongo Indian	Reliability	June 2012
5	Construct new transmission to connect new renewable generation in the Ivanpah area	SCE	-Construct new 230/115kV substation -Construct new double circuit 230kV line	Transmission for connecting new renewable generation	July 2013