

CAISO
Southern California
Long-Term
Regional Transmission Study

February, 2001

A Joint Study

- Completed February, 2001
- Studies performed by SDG&E, SCE and the CAISO
- Utilized information available on proposed development of new generation in and adjacent to the southern California region and long-range load forecasts
- Predicated on the philosophy that sufficient transmission reinforcement should be in place to reliably transport power from resources to customer load

Purpose

- Test grid performance
 - assuming the need to access new generation at either Palo Verde or PG&E's Midway Substation
- Identify reliability problems
- Mitigate with transmission reinforcements

Conclusions and Recommendations

- Major transmission reinforcements could be needed by 2008, without significant new resources within southern California region,
- Need is uncertain due to the considerable uncertainty about where future generation will be developed
- Market analysis will be needed to support the need to increase import capability
 - Cal-ISO, in coordination with SCE and SDG&E, should send out an RFP to select a consulting firm to develop and provide recommendations on principles and methodology to assess economic justification to access regional energy markets

SCE Project Alternatives Considered

- Build a new Palo Verde – Devers 500 kV line
- Build a new Midway – Serrano 500 kV line
- Upgrade series capacitors on Palo Verde-Devers No. 1 500 kV line
- Add 500/230 kV transformers as needed

SDG&E Project Alternatives Considered

- Build a new Miguel - Rainbow 500 kV line
- Build a new Palo Verde – San Diego 500 kV line (via Miguel)
- Build a new Palo Verde – San Diego 500 kV line (via Devers)
- Build Palo Verde - Rainbow 500 kV line
- Upgrade series capacitors on Palo Verde-Devers No. 1 500 kV line and/or SWPL
- Add 230 kV and 138 kV local lines and 500/230 kV and 230/69 kV transformers as needed

Study Criteria

- Criteria: CAISO Grid Planning Criteria
 - Incorporated WSCC and NERC criteria and standards

Methodology

- Methodology
 - Assessments
 - Thermal line loading
 - Voltage Limits
 - Reactive Margin
 - Transient Stability
 - Short Circuit Duty Screening

Methodology

- Methodology
 - Contingencies
 - All single contingencies (N-1, T-1, G-1)
 - Credible double contingencies (N-2; two lines, one line and one transformer, one line and one generator)
 - Selected overlapping (N-1-1)
 - Selected overlapping generator and line (system readjusted followed by line out)
 - Selected G-2 common switchyard (SONGS and Palo Verde)

Assumptions

- Base Case
 - 2008 Load Levels
 - CAISO Control Area = 54,482 MW
 - Including Projects:
 - Valley-Rainbow 500 kV line
 - 2000-2004 approved expansion projects
 - Full Loop with Rating Assumptions:
 - COI = 4800 MW
 - SCIT = 4/21/99
 - WOR = 10118
 - EOR = 7550 MW
 - SWPL = 1273 MW (970 MW SDG&E)
 - Midway-Vincent = 3000 MW
 - SDG&E-CFE = 408 MW
 - PDCI = 3100 MW

Results

- Two alternative plans of service appeared to satisfy study requirements
 - Either a second SWPL or a DPV2 will work generally
 - connection from San Diego to Rainbow via either Miguel or IV needed
 - Midway-Serrano prohibitively expensive
- Loads and resource requirements indicated:
 - Transmission lines could be required by 2008 without the addition of a significant amount of new merchant generation within southern California

Report Availability

- CAISO Website:
 - <http://www.caiso.com/docs/2000/06/16/2000061610404021794.html>