



Addendum to:
2012/2013 Transmission Planning Process
Unified Planning Assumptions
and Study Plan

Central California Study Scope

Draft

April 19, 2012

1. Introduction

In Section 4.8 the Unified Planning Assumptions and Study Plan for the 2012/2013 Transmission Planning Process the ISO identified that a study scope would be developed for the Central California area as an addendum to the Study Plan. This document provides the scope for the Central California area that will be studied as a part of the ISO 2012/2013 Transmission Planning Process.

2. Study Objective

The transmission infrastructure in Central California not only serves the overall Fresno area but it is also an integral part of the bulk electric system that facilitates power transfers throughout the ISO-controlled grid. In addition, Central California transmission system serves the interconnections with other jurisdictions within the Western Interconnection. With this, the performance of the system needs to be assessed under a variety of scenarios to ensure that the reliability requirements are met, as well as assessing potential policy or economic opportunities that may facilitate reliable delivery of the renewable energy to the ISO-controlled grid and the potential to allow for operation of flexible capacity to help integrate renewable energy.

The objective of this study is to evaluate the transmission system in Central California. The assessment will comprise of monitoring the transmission facilities while stressing the system. The studies will include, but not limited to the following:

- North of Los Banos north-to-south transfer capability
- Path 15 south-to-north transfer capability
- Path 26 transfer capability
- Fresno area import/export capability
- San Joaquin area transmission reinforcement requirements,
- Fresno area local capacity requirements, and
- Economic analysis for congestion relief and renewable integration
- Operational flexibility and potential economic benefit of Helms (pump and generation)

This study will also evaluate potential alternative transmission developments in Central California to address any reliability, policy or economic driven needs identified in the assessment. A qualitative assessment of other benefits not addressed in the direct evaluation, among alternative transmission developments, will also be considered. This study scope describes the studies and assessments that will be conducted to assess the transmission system in Central California.

3. Study Area

Figure 3-1 illustrates the bulk transmission system in California and the current interconnections to adjacent jurisdictions in the Western Interconnection. The primary study area for the Central California study is the 500 kV and 230 kV transmission system between Tesla and Midway substation as illustrated in Figure 3-2. The major transmission in the area:

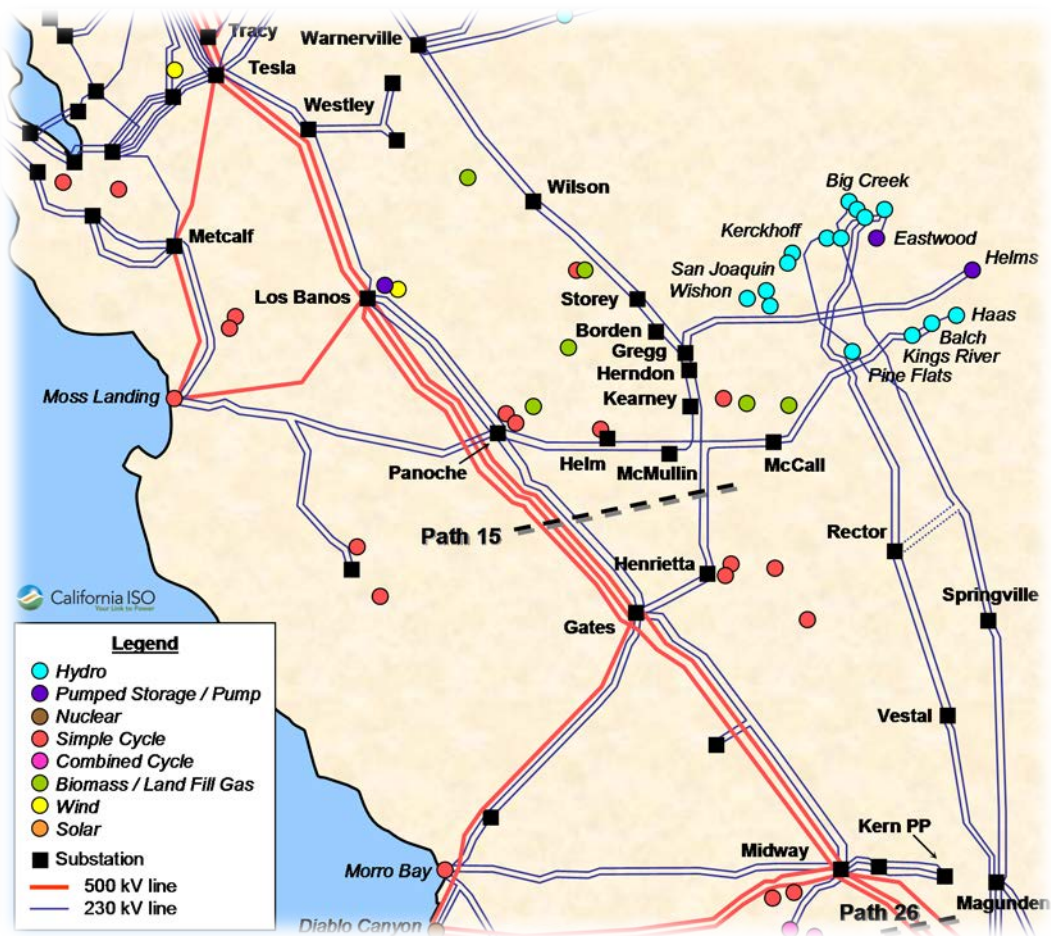
- WECC Path 15 (north of Midway)
- WECC Path 26 (south of Midway);
- 500 kV system North of Los Banos; and
- San Joaquin area 230 kV system.

Figure 3-1 Bulk Transmission System



Note: Map is from a general electrical connection and does not represent the line routing or rights-of-way

Figure 3-2 Central California Study Area



4. Technical Assessment

The assessment of flows path ratings, local area import/export capability as well as LCR, will be evaluated by analyzing system performance, of the existing system and potential transmission alternatives as required, under post contingency conditions.

Unless otherwise specified here, this study will be conducted with the same assumptions and methodology as all other reliability assessments described in the TPP study plan.

4.1 Study Years

Within the identified near and longer term study horizons the ISO will be conducting detailed analysis on the years 2017 and 2022¹. If in the analysis it is determined that additional years are required to be assessed, the ISO will consider conducting studies on these years or utilize past studies² in the areas as appropriate.

¹ Requirement R1.3.1 of TPL-001 and R1.3.2 of TPL-002, TPL-003 and TPL-004 states: "Cover critical system conditions and study years as deemed appropriate by the responsible entity."

² Requirement R1.3.1 of TPI-001, TPL-002, TPL-003 and TPL-004 states: "Be supported by a current or past study and/or system simulation..."

4.2 Study Scenarios

The study scenarios will be developed to simulate the critical system conditions³ that stress the transmission system under a variety of loading and generation scenarios. Table 4-1 provides the seasons that will be assessed in each of the study years.

Table 4-1: Summary of Study Scenarios

Study Area	2017	2022
Central California Study	Summer Peak Fall/Winter Summer Partial Peak Spring Light Load	Summer Peak Fall/Winter Summer Partial Peak Spring Light Load

The following provides a description of the system conditions that will be assessed for each of the study scenario identified in Table 4-1.

- Summer peak base case
 This case will be used to evaluate the impact on North of Los Banos north-to-south transfer capability with low hydro conditions in the Fresno area.

This case will also be used to quantify the “difference” in Fresno area LCR with and without the project.
- Fall/Winter base case
 This case will be used to evaluate the impact on Path 15 south-to-north transfer capability and will represent low hydro conditions at this time of the year.
- Summer partial peak base case
 This case will be used to evaluate the import capability of Fresno area under low hydro conditions during partial peak periods at about 8:00 PM (when transmission re-rates are not in effect per the PTO facility ratings).
- Spring Off-peak load base case
 This case will be used to evaluate the export capability of Fresno area during high resource output (hydro, QF, solar) at about 8:00 AM in low load conditions.

4.2.4 Sensitivity Analysis

Sensitivity cases will be developed with the generation dispatched in the study cases based upon varying operating conditions that the generation operates on the system and flows that occur on the major paths. These include:

- Dispatch of the variable generation that is not dispatchable (i.e. wind and solar) will be assessed under anticipated flows in the case as well as the condition of either being operated at or near capacity or at zero MW output.
- The hydro dispatch in the study area and northern California will impact the flows on the major paths. A sensitivity of a high hydro and low hydro condition will be assessed.

³ Requirement R1.3.1 of TPL-001 and R1.3.2 of TPL-002, TPL-003 and TPL-004

Sensitivity analysis will be also performed to study operational flexibility of the Helms Pump Storage Power Plant.

4.3 Reliability Standards and Criteria

The North American Electricity Council (NERC) Reliability Standards, Western Electricity Coordinating Council (WECC) Regional Criteria and the ISO Grid Planning Standards will be applied for the studies consistent with section 4.3.1 of the 2012/2013 Study Plan.

4.4 Contingencies

The ISO will select contingencies to assess the Central California transmission system consistent with approach illustrated in section 4.1.7 of the 2012/2013 Study Plan. The ISO will select the contingencies to evaluate the performance of the system that will produce the more severe system results and impacts⁴.

4.5 Base Cases

The base cases will be as identified in section 4.1.9 of the 2012/2013 Study Plan, with the power flow bases from WECC used as the starting point. The PG&E cases identified in Table 4-2 for the applicable year and season will be used. With the addition of the spring light load condition identified for the Central California study and not planned to be studied in the 2012/2013 Transmission Plan, the WECC case to be used for these scenarios will be selected from the WECC base cases as appropriate and will be documented in the study assessment.

4.6 Demand Forecast

The assessment will utilize the revised mid-case California Energy Demand Forecast 2012-2022 released by California Energy Commission (CEC) dated February 2012 consistent with section 4.1.11 of the 2012/2013 Study Plan.

The 1-in-5 load forecast will be used for studies consistent with the following analysis to be conducted in the 2012/2013 Study Plan:

- Bulk transmission system studies – section 4.1.11
- Policy driven analysis – section 4.2.2

The 1-in-10 load forecast will be used for studies consistent with the following analysis to be conducted in the 2012/2013 Study Plan:

- Local transmission system assessment in Fresno/San Joaquin – section 4.1.11
- Local Capacity studies for Fresno area – section 4.3

4.7 Generator Assumptions

The base cases developed for the study years will apply the generation assumptions identified in section 4.1.9 in the 2012/2013 Study Plan.

In the near term assessment cases, study year 2017, the generation additions and retirements will be modeled in the base cases consistent with the requirements identified in section 4.1.9 as identified under the **2-5 year Planning Cases**.

⁴ Requirement R1.3.1 of TPL-002, TPL-003 and TPL-004

In the longer term assessment cases, study year 2022, the conventional generation additions and retirements will be modeled in the base cases consistent with the requirements identified in section 4.1.9 of the 2012/2013 Study Plan. The renewable generation will be modeled in the cases per the renewable portfolios developed in 2012 by CPUC and CEC to meet the 33 per cent RPS requirement as per section 4.2 of the 2012/2013 Study Plan. The assessment will be done on the base portfolio and on the sensitivity portfolios as required based upon the differences in the flows in the area of the study.

4.8 Transmission Assumptions

The transmission system projects that will be modeled will be consistent with approach illustrated in section 4.1.10 of the 2012/2013 Study Plan. In addition, the reactive resources, protection systems, and control devices will be modeled consistently with sections 4.1.12, 4.1.15 and 4.1.16 of the 2012/2013 Study Plan.

4.9 Study Methodology

The assessment for the Central California will apply the study methodology consistent with section 4.1.19 of the 2012/2013 Study Plan for the other technical studies conducted in the planning cycle.

The studies will be conducted using GE PSLF as the main study tool per section 4.1.18 of the 2012/2013 Study Plan. The approach will be consistent with the bulk assessment of the 2012/2013 Transmission Plan with the governor power flow and transient stability analysis to be used to evaluate system performance following the contingencies of equipment at voltages 230 kV and higher.

5. Economic Planning Study

The ISO will conduct an Economic Planning Study consistent with the approach outlined in section 4.4 of the 2012/2013 Study Plan. The economic assessment will evaluate the level of congestion and the costs of such including the potential importance of Helms Pump Storage Plant full participation in the ancillary services in order to facilitate the integration of renewable resources and supporting reliability of the greater Fresno area in the following scenarios:

- Base renewable portfolio
- The sensitivity renewable portfolio with the highest level of congestion cost

In addition, sensitivity analysis will be conducted on the assumptions within the economic model. These cases will evaluate the sensitivity of economic outcome to certain input parameters in order to bracket the high and low economic benefits. These will include, but not limited to the following:

- Variations in forecasted demand
- Variations in hydro generation output; and
- Variations in gas price.

6. Study Schedule

The assessment of the Central California area of the system will be done as a part of the 2012/2013 planning cycle and included in the ISO 2012/2013 Transmission Plan. Table 6-1 illustrates the schedule of activities for the study which will be incorporated into the activities associated with schedule for the 2012/2013 Transmission Planning Process.

Table 6-1 Schedule for Central California study as part of 2012/2013 planning cycle

No.	Due Date	Activity	Phase
1	April 19, 2012	The ISO develops draft Addendum to 2012/2013 Study Plan for the Central California study scope and posts it on its website	I
2	April 26, 2012	The ISO hosts a stakeholder session to discuss the contents of draft study scope for the Central California study.	I
3	May 10, 2012	Comment period for stakeholders to submit comments on the stakeholder session and discussion on draft study scope	I
3	May 24, 2012	The ISO finalizes the Addendum to 2012/2013 Study Plan for the Central California study scope and posts it on its website	I
4	September 26-27, 2012	At stakeholder meeting #2 of 2012/2013 planning cycle, the ISO will present will present the preliminary results of the technical analysis conducted to date and potential alternatives that have been identified	II
5	December 11-12, 2012	At stakeholder meeting #3 of 2012/2013 planning cycle, the ISO will present will present the preliminary results of the technical analysis, economic analysis and alternatives that have been identified	II