



Addendum to:
Board-Approved 2011/2012 Transmission
Plan

Section 3.4.2.1 Assembly Bill 1318
Sensitivity Reliability Study Results

June 12, 2012

Addendum to Board-Approved 2011/2012 Transmission Plan Section 3.4.2.1 Assembly Bill 1318 Sensitivity Reliability Study Results

This Addendum to the Board-approved ISO 2011-2012 Transmission Plan (March 23, 2012 version) updates the study results for the LCR **sensitivity** analyses of the mid net load scenario conducted at the request of the state agencies (CARB, CEC, and CPUC) as set out in Section 3.4.2, page 254 of the 2011/2012 ISO Transmission Plan.

In that sensitivity analysis of the mid net load scenario, incremental uncommitted energy efficiency and additional combined heat and power, as provided by the state energy agencies (i.e., CPUC and CEC), were modeled in the 2021 environmentally constrained portfolio study case. The Addendum provides updated study results for the incremental uncommitted energy efficiency scenario, and new results for additional combined heat and power assumptions. The updates results also reflect the modeling of the Board-approved Del Amo – Ellis 230kV loop-in project that has been advanced to be in service in 2012. The Del Amo – Ellis 230kV loop-in project was not yet an approved project when the previous analyses took place, and was originally targeted to be in service in 2013.

As mentioned at the ISO's December 8, 2011 stakeholder meeting, the ISO treats these studies in which incremental uncommitted energy efficiency and additional combined heat and power as **sensitivity studies**, which were requested by the state energy agencies (i.e., the CPUC and CEC) to evaluate the impact to potential generation need in the LA Basin area had these programs materialized. The ISO considers these studies as sensitivity studies due to the uncertain nature of these programs whether they would materialize at the forecasted locations.

The following section 3.4.2.1 replaces and supersedes previous section 3.4.2.1 (pages 255 – 256) in the ISO 2011-2012 Transmission Plan (March 23, 2012 version).

3.4 Assembly Bill 1318 (AB1318) Reliability Studies

3.4.2.1 Study Results

The results of study items #1, 3 and 4 are provided in Section 3.3.2 (OTC Reliability Assessment Study Results). In this section, only new study results for item #2 above are reported. The following table includes assumptions provided by the CPUC and CEC in regards to assumptions of incremental uncommitted energy efficiency (EE) and combined heat and power (CHP) values for SCE and SDG&E.

Table 3.4-1: State energy agencies' provided assumptions on incremental uncommitted EE & CHP

Load Serving Entities	2021 Incremental Uncommitted EE (MW)	2021 Incremental Uncommitted CHP (MW)
SCE	2,461	209
SDG&E	496	14

The following presents a series of **sensitivity** study results with incremental uncommitted EE and/or additional CHP modeled for SCE and SDG&E. The study results are provided step by step to provide information regarding the incremental impacts of EE, CHP and the Del Amo-Ellis 230 kV loop-in project, respectively.

Table 3.4-2 provides a summary of study results with incremental uncommitted EE only and without the Del Amo – Ellis 230kV loop-in project¹. These changes are triggered by the following:

LA Basin's total LCR requirements:

- For this update, the ISO dispatched additional base-load generation in San Diego LCR area² to adequately mitigate a voltage instability concern under an N-1-1 contingency condition (i.e., Sunrise Powerlink and Southwest Powerlink). This minimum level of generation need in San Diego for this sensitivity study was modeled to ensure that we would not underestimate the generation need in the LA Basin LCR area. Previous studies had generation at a lower level in the San Diego area after modeling of the incremental uncommitted EE; however, this lower generation level turned out to be inadequate for mitigating the critical N-1-1 contingency voltage stability concern. Due to the interaction between LA Basin and San Diego LCR areas, the updated generation adjustment in turn resulted in having lower overall LCR requirements for the larger LA Basin.

Western LA Basin's new local generation requirements:

- In the previous sensitivity studies, the ISO inadvertently monitored the Serrano – Villa Park #2 230kV line, which has higher rating than its parallel Serrano – Villa Park #1 230kV line. In this updated study, the ISO correctly monitored the lower rated constrained line (i.e., Serrano – Villa Park #1 230kV line). This resulted in higher new local generation requirements³ to mitigate identified overloading concerns. The generation adjustment above for San Diego LCR area was included in this analysis for the Western LA Basin.

¹ The Del Amo – Ellis 230kV loop-in of Barre substation project was accelerated for summer 2012 due to extended outage of the San Onofre nuclear generation. This project brings Del Amo – Ellis 230kV line into Barre Substation, creating Del Amo – Barre and second Barre – Ellis 230kV lines.

² The total generation within San Diego LCR area for this sensitivity study is approximately 1,900 MW.

³ The definition of new generation requirements in this section refers to the repowering of once-through cooled generation with acceptable cooling technology.

Table 3.4-2: Summary of sensitivity assessment of the mid net load condition for the CPUC environmentally constrained portfolio with incremental EE

Portfolios	Area	LCR			New Gen. Required ? ^	Constraint	Contingency
		Non-D.G. (MW)	D.G. (Mw)	Total (MW)			
Environmentally Constrained (Mid Net Load Condition)	Western LA	5,847	869	6,716	Yes	Serrano - Villa PK#1	Serrano - Lewis #1 / Serrano - Villa PK#2
	LA Basin Overall	7,135	1,519	8,654	Yes %	Mira Loma West 500/230 Bank #1 (24-Hr rating) *	Chino - Mira Loma East #3 230kV line + Mira Loma West 500/230kV Bank #2
	Western LA OTC Range	868 - 1,437 MW plus SONGS					New generation need ranges from most effective to less effective locations
	Ellis**	434	124	558	Yes	Voltage Collapse**	Barre - Ellis 230kV Line + SONGS - Santiago #1 and #2 230kV Lines
	El Nido	327	91	418	No	La Fresa-Hinson 230 kV line	La Fresa-Redondo #1 and #2 230 kV lines

Notes:

^ This has assumptions of new generation coming from repowering of OTC units.

% New generation need for the LA Basin is carried over from the Western LA area new capacity need (i.e., OTC plant repowering)

* Mira Loma 500/230kV Bank #2 has a 24-hour emergency rating of 1,344 MVA

** In addition to generation requirements, two 79 MVAR shunt capacitors (Johanna & Santiago) and 140 MVAR at HB were modeled to mitigate voltage collapse concern to maintain load. If Santiago N-2 SPS is used (drop Santiago load), then no new unit is needed (i.e., no OTC repowering), but two shunt caps are still needed.

Table 3.4-3 provides a summary of study results with incremental uncommitted EE and incremental uncommitted CHP. With the additional uncommitted CHP modeled for the LA Basin as well as the San Diego LCR area, the need for new generation requirements in the Western LA Basin LCR area is lower than the scenario in Table 3.4-2. However, the total LCR needs in the larger LA Basin increase slightly, due to the lower effectiveness of the additional CHP.

Table 3.4-3: Summary of sensitivity assessment of the mid net load condition for the CPUC environmentally constrained portfolio with incremental uncommitted EE and CHP

Portfolios	Area	LCR			New Gen. Required ? ^	Constraint	Contingency
		Non-D.G. (MW)	D.G. (Mw)	Total (MW)			
Environmentally Constrained (Mid Net Load Condition)	Western LA	5,895	869	6,764	Yes	Serrano - Villa PK#1	Serrano - Lewis #1 / Serrano - Villa PK#2
	LA Basin Overall	7,203	1,519	8,722	Yes %	Mira Loma West 500/230 Bank #1 (24-Hr rating) *	Chino - Mira Loma East #3 230kV line + Mira Loma West 500/230kV Bank #2
	Western LA OTC Range	782 - 1,301 MW plus SONGS					New generation need ranges from most effective to less effective locations
	Ellis**	388	124	512	Yes	Voltage Collapse**	Barre - Ellis 230kV Line + SONGS - Santiago #1 and #2 230kV Lines
	El Nido	284	91	375	No	La Fresa-Hinson 230 kV line	La Fresa-Redondo #1 and #2 230 kV lines

Notes:

^ This has assumptions of new generation coming from repowering of OTC units.

% New generation need for the LA Basin is carried over from the Western LA area new capacity need (i.e., OTC plant repowering)

* Mira Loma 500/230kV Bank #2 has a 24-hour emergency rating of 1,344 MVA

** In addition to generation requirements, two 79 MVAR shunt capacitors (Johanna & Santiago) and 140 MVAR at HB were modeled to mitigate voltage collapse concern to maintain load. If Santiago N-2 SPS is used (drop Santiago load), then no new unit is needed (i.e., no OTC repowering) but two shunt caps are still needed.

Table 3.4-4 provides a summary of study results with incremental uncommitted EE, uncommitted CHP and the Del Amo – Ellis 230kV line loop-in project modeled. With the loop-in project in service, it eliminates the need for local generation in the Ellis sub-area for the mid net load sensitivity analyses. However, because the loop-in project has the effects of reducing impedance in the southern Orange County area, it causes more power flow through the area, thus increasing the overload on the Serrano – Villa Park #1 230kV line under an N-1-1 contingency. Therefore, more local generation would be needed to mitigate this overloading concern.

Table 3.4-4: Summary of sensitivity assessment of the mid net load condition for the CPUC environmentally constrained portfolio with incremental uncommitted EE, CHP and Del Amo – Ellis 230kV loop-in project

Portfolios	Area	LCR			New Gen. Required ? ^	Constraint	Contingency
		Non-D.G. (MW)	D.G. (Mw)	Total (MW)			
Environmentally Constrained (Mid Net Load Condition)	Western LA	6,155	869	7,024	Yes	Serrano - Villa PK#1	Serrano - Lewis #1 / Serrano - Villa PK#2
	LA Basin Overall	7,288	1,519	8,807	Yes %	Mira Loma West 500/230 Bank #1 (24-Hr rating) *	Chino - Mira Loma East #3 230kV line + Mira Loma West 500/230kV Bank #2
	Western LA OTC Range	1,042 - 1,677 MW plus SONGS					New generation need ranges from most effective to less effective locations
	Ellis	0	0	0	No	None	Barre - Ellis 230kV Line + SONGS - Santiago #1 and #2 230kV Lines
	EI Nido	274	91	365	No	La Fresa-Hinson 230 kV line	La Fresa-Redondo #1 and #2 230 kV lines

Notes:

* Mira Loma 500/230kV Bank #2 has a 24-hour emergency rating of 1,344 MVA.

^ This has assumptions of new generation coming from repowering of OTC units.

% New generation need for the LA Basin is carried over from the Western LA area new capacity need (i.e., OTC plant repowering).