California ISO Your Link to Power	OPERATING PROCEDURE	Procedure No.	T-133Z
		Version No.	9.2
		Effective Date	8/18/09
Effectiveness Factors- Bay Area		**Distribution Restriction: None**	

Table 1 – Effectiveness Factors, SIMULTANEOUS LOADING LIMIT

Simultaneous Loading Limit Components	MW increase in the CALCULATED LOADING across the transmission facilities that make up the SIMULTANEOUS LOADING LIMIT FOR 100MW INCREASE in generation.													
	Internal										External			
	SF	Ptsb. 115kV	Ptsb. 230kV	Oak-land	Contra Costa	Los Esteros	Lambie	River -view	Gil-roy	MEC	Moss 230 kV	Moss 500 kV	Geysers	Calpeak
Resource ID→	See Table 4 at the end of the document for Generation Group Descriptions.													
Pittsburg – San Mateo 230kV Line & Pittsburg – Eastshore 230kV Line	*-10*	*11*	*12*	*7*	*2*	*-3*	*2*	-	*-2*	*-2*	-	-	*6*	*2*
Kelso – Tesla 230kV Line (←) & Delta Sw Yd – Tesla 230kV Line (←)	*-4*	*-6*	*-6*	*-10*	*-34*	*-4*	*-14*	*-22*	*-2*	*-2*	-	-	*-7*	*-7*
Pittsburg – Tesla #1 & #2 230kV Lines (←)	*-10*	*-32*	*-35*	*-21*	*-6*	*-5*	*-5*	*-6*	*-3*	*-2*	-	-	*-16*	*-5*
Ravenswood – San Mateo #1 230kV line & Ravenswood – San Mateo #2 230kV line & Ravenswood – San Mateo 115kV line	*-10*	-	-	-	-	-	-	-	-	-	-	-	-	-
Newark-Ravenswood 230kV Line & Tesla-Ravenswood 230kV Line & Newark-Ames Distribution 115kV Line	*-5*	-	-	-	-	-	-	-	-	-	-	-	-	-
Monta Vista – Jefferson 230kV Lines #1 & #2	*-22*	*-4*	*-5*	*-4*	*-3*	*-2*	*-2*	*-2*	*3*	*5*	*2*	*2*	*-3*	*-2*
Tesla 500/230kV Banks #6 Onto #4	*-10*	*-12*	*-12*	*-11*	*-13*	*-8*	*-7*	*-12*	*-3*	*-2*	-	-	*-6*	*-2*
Tesla 500/230kV Banks #4 Onto #6	*-15*	*-22*	*-24*	*-17*	*-12*	*-13*	*-7*	*-11*	*-6*	*-5*	*-2*	-	*-11*	*-4*
Sobrante–Griz–Clare K #1 & #2 115kV Line	-	*2*	*2*	*-15*	*-2*	-	-	-	-	-	-	-	*3*	-
Pittsburg 230/115kV Banks #12 & #13	-	*-57*	*4*	*-9*	*-2*	-	-	-	-	-	-	-	*-2*	-
Metcalf – Morgan Hill 115kV Line(←) & Metcalf – Llagas 115kV Line(←)	-	-	-	-	-	-	-	-	*98*	-	-	-	-	-
Oakland D – L & CX – 2 115kV Cables	-	-	-	*-100*[Note2]	-	-	-	-	-	-	-	-	-	-
Llagas – Gilroy 115kV Line (←)	-	-	-	-	-	-	-	-	*100*	-	-	-	-	-
Delta Switchyard – Tesla 230kV Line (←)	*-3*	*-5*	*-5*	*-8*	*-19*	*-3*	*-12*	*-18*	*-2*	-	-	-	*-6*	*-5*
Moraga 230/115 kV Bank #3 onto Bank #1	-	*-7*	*-5*	*-20*	*2*	-	-	*2*	-	-	-	-	*-4*	-

Note 1: Due to the Moss Landing 230 kV Generation SPS, decreasing the Moss Landing 230 kV Generation will not reduce the Calculated Loading on the Moss Landing-Metcalf #1 & #2 230 kV Line & Moss Landing-Metcalf 500kV Line Simultaneous Loading Limit. See the respective Calculated Loading equation in Table 1.1. For a detailed description of Moss Landing SPS; see Attachment G.
Note 2: Due to the Oakland CX or DL SPS that arms load drop of Alameda and Cartwright, Alameda Generation is ineffective in mitigating this loading equation.
Note 3: Only Delta Energy as part of Pittsburg 230kV Gen Group is applicable.

Table 2– Effectiveness Factors, Transmission Facilities 230kV and above

Transmission Facilities 230kV and above	MW increase in the CALCULATED LOADING across the transmission facilities that make up the SIMULTANEOUS LOADING LIMIT FOR 100MW INCREASE in generation.													
	Internal										External			
	SF	Ptsb. 115kV	Ptsb. 230kV	Oak-land	Contra Costa	Los Esteros	Lambie	River-view	Gil-roy	MEC	Moss 230 kV	Moss 500 kV	Gey-sers	Cal-peak
Resource ID→	See Table 4 at the end of the document for Generation Group Descriptions.													
500/230kV Transformers														
Metcalf 500/230KV Bank #11	-9	-4	-4	-4	-3	-11	-2	-3	-17	-19	-4	-	-2	-
Metcalf 500/230KV Bank #12	-10	-4	-4	-4	-3	-11	-2	-3	-19	-20	-5	2	-3	-
Metcalf 500/230KV Bank #13	-10	-4	-5	-4	-3	-12	-2	-3	-19	-21	-5	2	-3	-
Moss Landing 500/230KV Bank #9	5	3	3	3	3	5	2	2	7	8	57	-12	2	2
Tesla 500/230KV Bank #2	-9	-5	-5	-5	-5	-7	-2	-5	-2	-	-	-	-2	-
Tesla 500/230KV Bank #4	-7	-7	-7	-7	-11	-5	-5	-10	-2	-	-	-	-4	-
Tesla 500/230KV Bank #6	-14	-21	-22	-16	-10	-12	-6	-9	-6	-4	-2	-	-11	-3
Tracy 500/230KV Banks KT1A **OR** KT2A	-4	-4	-4	-4	-6	-4	-3	-5	-2	-	-	-	-3	-2
Vaca Dixon 500/230KV Bank #11 **OR #12**	-6	-11	-10	-15	-15	-5	-24	-16	-2	-2	-	-	-23	-32
230kV Transmission Lines														
Ignacio (Crock Tap) – Sobrante 230KV Line	-2	-6	-6	-5	-	-	-	-	-	-	-	-	19	3
Lakeville-Sobrante #2 230KV Line	-2	-7	-7	-6	-	-2	2	-	-	-	-	-	23	3
Moss Landing-Metcalf #1 **OR** #2 230KV	-5	-3	-3	-3	-3	-5	-3	-3	-7	-7	13	2	-3	-2
Newark – Ravenswood 230KV Line	-33	-3	-4	-	4	8	2	3	-	-	-	-	-	-
Pittsburg – Eastshore 230KV Line	-8	9	10	6	-	-2	-	-	-2	-	-	-	5	-
Pittsburg – San Mateo 230KV Line	-9	8	9	5	-	-2	-	-	-	-	-	-	4	-
Ravenswood – San Mateo #1 **OR** #2 230KV	-22	-5	-5	-3	-	-	-	-	-	-	-	-	-2	-

Transmission Facilities 230kV and above	MW increase in the CALCULATED LOADING across the transmission facilities that make up the SIMULTANEOUS LOADING LIMIT FOR 100MW INCREASE in generation.														
	Internal										External				
	SF	Ptsb. 115kV	Ptsb. 230kV	Oak-land	Contra Costa	Los Esteros	Lambie	River-view	Gil-roy	MEC	Moss 230 kV	Moss 500 kV	Gey-sers	Cal-peak	
Resource ID→	See Table 4 at the end of the document for Generation Group Descriptions.														
Kelso – Tesla 230KV Line (←)	-3	-4	-4	-7	-15	-3	-9	-14	-	-	-	-	-4	-4	
Delta Switchyard – Tesla 230KV Line (←)	-3	-5	-5	-8	-19	-3	-12	-18	-2	-	-	-	-6	-5	
Tesla – Newark #1 230KV line	-11	-7	-7	-7	-5	-14	-3	-5	-7	-6	-3	-2	-4	-2	
Tesla – Newark #2 230kV line	-10	-	-	-2	-3	-13	-2	-3	-6	-5	-2	-2	-	-	
Pittsburg – Tesla #1or #2 230 kV (←)/(→)	-5 5	-16 16	-17 17	-10 10	-3 3	-2 2	-3 3	-	-	-	-	-	-8 8	-2 2	
Tesla – Ravenswood 230KV Line	-16	-6	-6	-5	-3	-9	-2	-3	-5	-4	-2	-2	-3	-	
Tesla – Tracy #1 **OR** #2 230KV Lines (←)	-5	-6	-6	-6	-8	-5	-5	-7	-3	-2	-	-	-4	-3	
Vaca Dixon – Bahia 230KV Line	-2	-4	-3	-7	-3	-2	-	-2	-	-	-	-	4	4	
Vaca Dixon – Peabody 230kV Line	-2	-2	-2	-3	-11	-2	-2	-10	-	-	-	-	3	6	
Monta Vista – Jefferson 230kV Line #1 **OR** #2	-11	-2	-2	-2	-	-	-	-	2	2	-	-	-	-	
Vaca Dixon – Lambie Sw Sta 230kV Line	-2	-2	-2	-3	-16	-2	-58	-19	-	-	-	-	3	7	
Vaca Dixon – Parkway 230KV Line	-2	-4	-4	-8	-3	-2	-	-3	-	-	-	-	4	4	

Table 3 – Effectiveness Factors, Sub-transmission Facilities below 230kV

Sub-Transmission Facilities	MW increase in the CALCULATED LOADING across the transmission facilities that make up the SIMULTANEOUS LOADING LIMIT FOR 100MW INCREASE in generation.													
	Internal										External			
	SF	Ptsb. 115kV	Ptsb. 230kV	Oak-land	Contra Costa	Los Esteros	Lambie	River-view	Gilroy	MEC	Moss 230 kV	Moss 500 kV	Gey-sers	Cal-peak
Resource ID→	See Table 4 at the end of the document for Generation Group Descriptions.													
230/115kV Transformers														
Pittsburg 230/115KV Banks #12 **OR** #13	-	-40	3	-6	-	-	-	--	-	-	--	--	--	-
Moraga 230/115KV Bank #3	-	-11	-8	-32	4	-	2	4	-	-	--	--	-6	-
Moraga 230/115KV Bank #1	-	-4	-3	-11	-	-	-	-	-	-	--	--	-2	-
115kV Transmission Lines														
Llagas – Gilroy 115Kv Line (←)	-	-	-	-	-	-	-	--	100	-	--	--	--	-
Metcalf – El Patio #1 OR **#2 115KV Line**	-	-	-	-	-	-5	-	--	*3*	-	--	--	--	-
Metcalf – Llagas 115KV Line(←)	-	-	-	-	-	-	-	--	49	-	--	--	--	-
Metcalf – Morgan Hill 115KV Line(←)	-	-	-	-	-	-	-	--	49	-	--	--	--	-
Moraga – Oakland Station J 115KV Line	-	-	-	-	-	-	-	--	-	-	--	--	--	-
Oakland CX 115KV Cable **(←)**	-	-	-	-48	-	-	-	--	-	-	--	--	--	-
Oakland DL 115KV Cable	-	-	-	-53	-	-	-	--	-	-	--	--	--	-
Ravenswood – San Mateo 115KV Line	-8	-	-	-	-	-	-	--	-	-	--	--	--	-
Sobrante – Griz – Clare St K #1 **OR** #2 115KV	-	*2*	*2*	-15	-	-	-	--	-	-	-	--	*3*	-
Sobrante – Moraga 115KV Line	-	5	6	-14	-3	-	-2	-3	-	-	-	--	6	-
Bair – Belmont 115kV Line	-6	-	-	-	-	-	-	--	-	-	--	--	--	
Newark – Ames #1, #2, #3, & Newark-Ames Distribution 115kV Lines	-3	-	-	-	-	-	-	--	-	-	--	--	--	-

Note 3: Wolfskill Energy Center has approximately the same effectiveness factor as Calpeak.

Notes for Table 1 through 3

- The Tables assume the direction of power flow is indicated by the name of the transmission facility unless an arrow symbol "**(←)**" is added to the name in Tables 1 through 3.
  1. Example 1, MW flow is assumed from Newark to Ravenswood on the "Newark-Ravenswood 230kV Line" (therefore, no symbol is required.
  2. Example 2, MW flow is assumed from Tracy to Tesla on the "Tesla-Tracy #1 & #2 230kV Lines **(←)"**. The typical direction of power flow is also illustrated in Attachment D – Sketches, Bay Area Transmission System.
- Tables 1 through 3 were constructed with the assumption that Pittsburg Series Reactors are bypassed. In addition, two reactors in-service on the Jefferson-Martin 230kV Cable and two reactors in-service on the San Mateo-Martin 230kV Cable. Most of the Effectiveness Factors do not change much with the insertion of the Pittsburg Series Reactors.
- Dispatchers must use judgment when alleviating transmission constraints – note that Tables 1, 2, and 3 do not consider economic factors. Therefore, the "most effective" mitigation measure may not necessarily be the "most efficient/economic" solution to relieve facility loading.
- A list of the individual units within each of the GENERATION GROUPS (e.g. SF, Ptsb. 115kV, Ptsb. 230kV, Oak, Contra Costa, Moss Landing & Geysers) utilized in Tables 1 through 3 is provided in G-233 Attachment E. "Moss 230kV" means Moss Landing Power Blocks PB1 and PB2.
- Procedure T-150 & T151 provide Geysers Generation Dispatch Instructions.

Table 4- Resource IDs

Generation Group	Resource Name	Resource ID
San Francisco Group	Potrero Unit 3	POTRPP_7_UNIT 3
	Potrero Unit 4	POTRPP_7_UNIT 4
	Potrero Unit 5	POTRPP_7_UNIT 5
	Potrero Unit 6	POTRPP_7_UNIT 6
Pittsburg Group- 115KV	Los Medanos Energy Center (1X0 Mode)	LMEC_1_CC1X0
	Los Medanos Energy Center (1X1 Mode)	LMEC_1_CC1X1
	Los Medanos Energy Center (2X1 Mode)	LMEC_1_CC2X1
	Los Medanos Energy Center AGGREGATE	LMEC_1_PL1X3
Pittsburg Group- 230KV	Pittsburg Unit 5	PITTSP_7_UNIT 5
	Pittsburg Unit 6	PITTSP_7_UNIT 6
	Pittsburg Unit 7	PITTSP_7_UNIT 7
	Delta Energy Center Aggregate	DELTA_2_PL1X4
	Delta Energy Center CCYC Mode 1X0	DELTA_2_CC1X0
	Delta Energy Center CCYC Mode 1X1	DELTA_2_CC1X1
	Delta Energy Center CCYC Mode 2X1	DELTA_2_CC2X1
	Delta Energy Center CCYC Mode 3X1	DELTA_2_CC3X1
Oakland Group	Oakland Station C GT Unit 1	OAK C_7_UNIT 1
	Oakland Station C GT Unit 2	OAK C_7_UNIT 2
	Oakland Station C GT Unit 3	OAK C_7_UNIT 3
	Alameda GT Unit 1	ALMEGT_1_UNIT 1
	Alameda GT Unit 2	ALMEGT_1_UNIT 2
Contra Costa Group	Contra Costa Unit 6	COCOPP_7_UNIT 6
	Contra Costa Unit 7	COCOPP_7_UNIT 7
	Gateway Generation Station	GATWAY_2_PL1X3

***** Resource Names and IDs that are grayed out are not normally submitted in schedules, they are usually part of an aggregated schedule.

Generation Group	Resource Name	Resource ID
Los Esteros Group	Los Esteros Energy Facility Aggregate	LECEF_1_UNITS
Gilroy Group	Gilroy Cogen (1X0 Mode)	GILROY_1_CC1X0
	Gilroy Cogen (1X1 Mode)	GILROY_1_CC1X1
	Gilroy Cogen Aggregate	GILROY_1_UNIT
	Gilroy Energy Center Unit 1	GILRPP_1_UNIT 1
	Gilroy Energy Center Unit 2	GILRPP_1_UNIT 2
	Gilroy Energy Center Units 1 & 2 Aggregate	GILRPP_1_PL1X2
	Gilroy Energy Center, Unit #3	GILRPP_1_PL3X4
Moss Landing	Moss Landing – Unit 6	MOSSLD_7_UNIT6
	Moss Landing – Unit 7	MOSS_7_UNIT7
	Moss Landing Power Block 1	MOSSLD_2_PSP1
	Moss Landing Power Block 2	MOSSLD_2_PSP2

***** Resource Names and IDs that are grayed out are not normally submitted in schedules, they are usually part of an aggregated schedule.

Generation Group	Resource Name	Resource ID
Geysers Group	Geothermal Energy Partners 1	ADLIN_1_UNIT 1
	Geothermal Energy Partners 2	ADLIN_1_UNIT 2
	Calpine Geysers CO. L. P. (KW#1)	BEARCN_2_UNIT 1
	Calpine Geysers CO. L. P. (KW#2)	BEARCN_2_UNIT 2
	Calpine Geysers Units 5 & 6 Aggregate	GYS5X6_7_UNITS
	Calpine Geysers Units 7 & 8 Aggregate	GYS7X8_7_UNITS
	Geysers Unit 11 (Healdsburg)	GEYS11_7_UNIT11
	Geysers Unit 12 (Healdsburg)	GEYS12_7_UNIT12
	Geysers Unit 13 (Healdsburg)	GEYS13_7_UNIT13
	Geysers Unit 14 (Healdsburg)	GEYS14_7_UNIT14
	Geysers Unit 16 (Healdsburg)	GEYS16_7_UNIT16
	Geysers Unit 17 (Healdsburg)	GEYS17_7_UNIT17
	Geysers Unit 18 (Healdsburg)	GEYS18_7_UNIT18
	Geysers Unit 20 (Healdsburg)	GEYS20_7_UNIT20
	Geysers Power Company, LLC	SANTFG_7_UNITS
	Sonoma Power Plant	SMUDGO_7_UNIT 1
	Sonoma County Landfill	SNMALF_6_UNITS
	Calpine Geysers CO. L. P. (WFF)	WDFRDF_2_UNITS
	NCPA Geo Plant 1 Unit 1	NCPA_7_GP1UN1
	NCPA Geo Plant 1 Unit 2	NCPA_7_GP1UN2
	NCPA Geo Plant 2 Unit 3	NCPA_7_GP2UN3
	NCPA Geo Plant 2 Unit 4	NCPA_7_GP2UN4
	Bottlerock	GEYS17_2_BOTRCK
Lambie/Gooshaven/ Creed Group	Lambie Energy Center, Unit #1	LMBEPK_2_UNITA1
	Goose Haven Energy Center, Unit #1	LMBEPK_2_UNITA3
	Creed Energy Center, Unit #1	LMBEPK_2_UNITA2
Riverview Group	Riverview Energy Center (GP Antioch)	RVRVEW_1_UNITA1
Calpeak/Wolfskill Group	Calpeak Power – VACA DIXON LLC	VACADX_1_UNITA1
	Wolfskill Energy Center - Calpine	WOLFSK_1_UNITA1

***** Resource Names and IDs that are grayed out are not <u>normally</u> submitted in schedules, they are usually part of an aggregated schedule.