
 California ISO	Operating Procedure	Procedure No. 2210Z
		Version No. 29.3
		Effective Date 12/05/24
Effectiveness Factors - All		Distribution Restriction: None

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1. Procedure Detail

1.1 Effectiveness Factors

Note: *Effectiveness factors must be considered in conjunction with other factors affecting current system conditions and overall efficiencies. These factors include (but are not limited to) specific unit availability, transmission outages, impact on congestion to other paths, and relative costs. Due to the substantially dynamic and variable nature of system operating conditions, which affect Generation effectiveness factors, and in the interests of maximizing consistency in mitigation actions, assumptions of system conditions have been applied to power flow models to arrive at reasonable effectiveness factors that may be applied over a range of operating conditions.*

Bus Injection Effectiveness Factors (BIEF) from Real-Time Contingency Analysis (RTCA) may be substituted for those listed in 22 10Z, as the BIEF in RTCA may be more accurate.

If dispatch for gas resources is substantially different from Day-Ahead schedules, contact gas suppliers to confirm that this won't be an issue.

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6110 - Effectiveness Factors for the California-Oregon Intertie (COI): (version 14.2, 11/07/24)

Table 5: Generation Effectiveness Factors: Normal Operations Flow Limits

Resource ID	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.															
	See Table 5A for corresponding Resource ID's															
	PG&E Pit River System Units	Feather River Generation		CDWR Lake Oroville River Units	South Feather River Units			Colusa	Hatchet Ridge	Bogue Units 56-57	Pease 60 kV Units 58-60	Drum Area Units 61-67	COI	LODI Generation		Bellota Generation
		Units 20-25	Units 26-34		Units 45-49	Units 50-51	Units 52-53							Units 68-69	Unit 70	
Control Point (CP) #1 0.07*Table Mountain – Tesla 500 kV (→, @Table) + 0.07*Table Mountain –Vaca 500 kV(→, @Table) + Table Mountain – Rio Oso 230 kV (→, @Table)	6	N/A ²	-16	16	4 to 6	-2	-2	N/A	6	-4	N/A	-5 to -10	7	-5	-5	-4
CP #2 0.81*Round Mountain – Table Mountain #1 500 kV (→, @Round) + Round Mountain – Table Mountain #2 500 kV (→, @Round) Or 0.81*Round Mountain – Table Mountain #2 500 kV (→, @Round) + Round Mountain – Table Mountain #1 500 kV (→, @Round)	36 to 44	-18	-10	-20	-10	-14	-13	9	42	-13	-14	-10	52	-6	-5	N/A

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Distribution Restriction: None

Resource ID	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation. See Table 5A for corresponding Resource ID's															
	PG&E Pit River System Units	Feather River Generation		CDWR Lake Oroville River Units	South Feather River Units			Colusa	Hatchet Ridge	Bogue Units 56-57	Pease 60 kV Units 58-60	Drum Area Units 61-67	COI	LODI Generation		Bellota Generation
		Units 20-25	Units 26-34		Units 45-49	Units 50-51	Units 52-53							Units 68-69	Unit 70	
CP #3 0.08*Round Mountain – Table Mountain #1 500 kV (→, @Round) + 0.08*Round Mountain – Table Mountain #2 500 kV (→, @Round) +Table Mountain 500/230 KV Bank (←, @230 KV)	N/A ¹	N/A ²	3 3	77	6	51	49	-2	N/A	45	51	24	N/A	9	12	7
CP #4 0.178*[Table Mt-Vaca Dixon 500 kV (→) + Table Mt-Tesla 500 kV (→)] + Table Mt 500/230 kV (→) + 0.67*[Caribou Units 1-3 + Butt Valley] + 0.70*[Caribou Units 4-5] + 0.06*[Helms Units 1-3 Pump Load] (To be used only when pumping) ³	12 to 14	-60 to -64	-30	-66	-52	-45	-43	4	13	-39	-45	-20	16	-9	-9	-7
CP #5 0.012*(Table Mountain – Vaca 500 kV line) + 0.012*(Table Mountain – Tesla 500 kV line) + Pease-Rio Oso 115 kV line (→, @Pease) - 0.033*[Caribou Units 1-3 + Butt Valley] - 0.029*[Caribou Units 4-5] ⁴	N/A	N/A ²	N/A	2	7	2	4	N/A	N/A	N/A	28	-3	1	N/A	N/A	N/A

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Resource ID	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.															
	See Table 5A for corresponding Resource ID's															
	PG&E Pit River System Units	Feather River Generation		CDWR Lake Oroville River Units	South Feather River Units			Colusa	Hatchet Ridge	Bogue Units 56-57	Pease 60 kV Units 58-60	Drum Area Units 61-67	COI	LODI Generation		Bellota Generation
Units 20-25		Units 26-34	Units 45-49		Units 50-51	Units 52-53	Units 68-69							Unit 70		
CP #6 0.03*(Table Mountain – Vaca 500 kV line) + 0.03*(Table Mountain – Tesla 500 kV line) + Rio Oso – Lockeford 230 kV line (→, @Rio Oso) - 0.067*[Caribou Units 1-3 + Butt Valley] ⁵	2	N/A ₂	N/A	6	8	N/A	N/A	N/A	2	N/A	9	8	3	3	-20	-6
CP #7 0.015*Table Mountain – Vaca 500 kV line (→, @ Table Mountain) + 0.015*Table Mountain – Tesla 500 kV line (→, @Table Mountain) + Nicolaus-Rio Oso 115 kV line (→, @E. Nicolaus) - 0.043*[Caribou Units 1-3 + Butt Valley] - 0.038*[Caribou Units 4-5] ⁶	N/A	N/A ₂	-2	3	8 to 10	5	27	N/A	N/A	-3	15	-5	1.5	N/A	N/A	N/A
CP #8 0.009*Table Mountain – Vaca 500 kV line (→, @ Table Mountain) + 0.009*Table Mountain – Tesla 500 kV line (→, @Table Mountain) + Bogue-Rio Oso 115 kV line (→, @Rio Oso) ⁷	N/A	N/A ₂	N/A	2	8	N/A	N/A	N/A	N/A	61	N/A	-2 to -4	1	N/A	N/A	N/A

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Effectiveness Factors - All

**Distribution Restriction:
None**

Resource ID	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.															
	See Table 5A for corresponding Resource ID's															
	PG&E Pit River System Units	Feather River Generation		CDWR Lake Oroville River Units	South Feather River Units			Colusa	Hatchet Ridge	Bogue Units 56-57	Pease 60 kV Units 58-60	Drum Area Units 61-67	COI	LODI Generation		Bellota Generation
Units 20-25		Units 26-34	Units 45-49		Units 50-51	Units 52-53	Units 68-69							Unit 70		
CP #9 0.0084*Table Mountain – Vaca 500 kV line (→, @ Table Mountain) + 0.0084*Table Mountain – Tesla 500 kV line (→, @ Table Mountain) + Palermo-Pease 115 kV line (→, @ Palermo) - 0.032*[Caribou Units 1-3 + Butt Valley] - 0.026*[Caribou Units 4-5] ⁸	N/A	N/A ²	N/A	2	10	N/A	-4	N/A	N/A	N/A	-28	-2	1	N/A	N/A	N/A
CP #10 0.0645*Table Mountain – Vaca 500 kV line (→, @ Table Mountain) + 0.0645*Table Mountain – Tesla 500 kV line (→, @ Table Mountain) + Round Mountain – Cottonwood 230 kV #3 line (→, @ Round Mountain) - 0.057*[Caribou Units 1-3 + Butt Valley] - 0.061*[Caribou Units 4-5] ⁹	9-14	N/A ²	2	6	5	4	3	-4	11	3	4	2	6	N/A	N/A	N/A
CP #11 0.63*Malin-Round Mountain 500 kV #1 line (→, @ Malin) + 0.63*Malin-Round Mountain 500 kV #2 line (→, @ Malin) + Captain Jack – Olinda 500 kV line (→, @ Captain Jack)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100	N/A	N/A	N/A

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Resource ID	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.															
	See Table 5A for corresponding Resource ID's															
	PGAE Pit River System Units	Feather River Generation		CDWR Lake Oroville River Units	South Feather River Units			Colusa	Hatchet Ridge	Bogue Units 56-57	Pease 60 kV Units 58-60	Drum Area Units 61-67	COI	LODI Generation		Bellota Generation
Units 20-25		Units 26-34	Units 45-49		Units 50-51	Units 52-53	Units 68-69							Unit 70		
CP #12 0.03*Table Mountain – Vaca 500 kV line(->, @Table Mountain) + 0.03*Table Mountain – Tesla 500 kV line(->,Table Mountain) + Delevan – Cortina 230 kV line (→, @Delevan)	3	N/A	N/A	N/A	N/A	N/A	N/A	30	3	N/A	N/A	N/A	4	N/A	N/A	N/A

Note: This table indicates the degree of effectiveness that Generation will be at relieving the calculated loading across the multiple transmission facilities that make up the control point. (- refers to increase generation, + refers to decrease generation to relieve control point)

Note¹: The respective resources are not effective in mitigating the control point-3.

Note²: These units (Caribou, Butt valley, Hyatt and Thermalito) are tripped due to PGAE RAS actions and should not be used in mitigation.


Note³: The Market Nomogram for CP#4 has been modeled using the following equation:
 $0.19 * \text{Table Mountain} - \text{Vaca } 500 \text{ kV line } 500 \text{ kV } (\rightarrow, @\text{Table}) + 0.19 * \text{Table Mountain} - \text{Tesla } 500 \text{ kV line } 500 \text{ kV } (\rightarrow, @\text{Table}) + \text{Table Mountain } 500/230 \text{ KV Bank } (\rightarrow, @230 \text{ KV})$

Note⁴: The Market Nomogram for CP#5 has been modeled using the following equation:
 $0.011 * (\text{Table Mountain} - \text{Vaca } 500 \text{ kV line}) + 0.011 * (\text{Table Mountain} - \text{Tesla } 500 \text{ kV line}) + \text{Pease-Rio Oso } 115 \text{ kV line } (\rightarrow, @\text{Pease})$

Note⁵: The Market Nomogram for CP#6 has been modeled using the following equation:
 $0.026 * (\text{Table Mountain} - \text{Vaca } 500 \text{ kV line}) + 0.026 * (\text{Table Mountain} - \text{Tesla } 500 \text{ kV line}) + \text{Rio Oso} - \text{Lockeford } 230 \text{ kV line } (\rightarrow, @\text{Rio Oso})$

Note⁶: The Market Nomogram for CP#7 has been modeled using the following equation:
 $0.014 * \text{Table Mountain} - \text{Vaca } 500 \text{ kV line } (\rightarrow, @\text{Table Mountain}) + 0.014 * \text{Table Mountain} - \text{Tesla } 500 \text{ kV line } (\rightarrow, @\text{Table Mountain}) + \text{Nicolaus-Rio Oso } 115 \text{ kV line } (\rightarrow, @\text{E. Nicolaus})$

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Note⁷: The Market Nomogram for **CP#8** has been modeled using the following equation:
 $0.0084 * \text{Table Mountain} - \text{Vaca 500 kV line } (\rightarrow, @ \text{ Table Mountain}) + 0.0084 * \text{Table Mountain} - \text{Tesla 500 kV line } (\rightarrow, @ \text{Table Mountain}) + \text{Bogue-Rio Oso 115 kV line } (\rightarrow, @ \text{Rio Oso})$

Note⁸: The Market Nomogram for **CP#9** has been modeled using the following equation:
 $0.0075 * \text{Table Mountain} - \text{Vaca 500 kV line } (\rightarrow, @ \text{ Table Mountain}) + 0.0075 * \text{Table Mountain} - \text{Tesla 500 kV line } (\rightarrow, @ \text{Table Mountain}) + \text{Palermo-Pease 115 kV line } (\rightarrow, @ \text{Palermo})$

Note⁹: The Market Nomogram for **CP#10** has been modeled using the following equation:
 $0.063 * \text{Table Mountain} - \text{Vaca 500 kV line } (\rightarrow, @ \text{ Table Mountain}) + 0.063 * \text{Table Mountain} - \text{Tesla 500 kV line } (\rightarrow, @ \text{Table Mountain}) + \text{Round Mountain} - \text{Cottonwood 230 kV \#3 line } (\rightarrow, @ \text{Round Mountain})$



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Table 5A: Resource IDs


River System	Resource ID		
PGAE Pit River System Units	1.HATCR1_7_UNIT 2.HATCR2_7_UNIT 3.PIT1_7_UNIT 1 4.PIT1_7_UNIT 2 5.PIT3_7_UNIT 1 6.PIT3_7_UNIT 2 7.PIT3_7_UNIT 3	8.PIT4_7_UNIT 1 9.PIT4_7_UNIT 2 10.PIT5_7_UNIT 1 11.PIT5_7_UNIT 2 12.PIT5_7_UNIT 3 13.PIT5_7_UNIT 4 14.BLACK_7_UNIT 1	15.BLACK_7_UNIT 2 16.PIT6_7_UNIT 1 17.PIT6_7_UNIT 2 18.PIT7_7_UNIT 1 19.PIT7_7_UNIT 2
PGAE Feather River System Units	20.BUTTVL_7_UNIT 1 21.CARBOU_7_UNIT 2 22.CARBOU_7_UNIT 3 23.CARBOU_7_UNIT 1 24.CARBOU_7_UNIT 4	25.CARBOU_7_UNIT 5 26.BELDEN_7_UNIT 1 27.RCKCRK_7_UNIT 1 28.RCKCRK_7_UNIT 2 29.BUCKCK_7_UNIT 1	30.BUCKCK_7_UNIT 2 31.CRESTA_7_UNIT 1 32.CRESTA_7_UNIT 2 33.POEPH_7_UNIT 1 34.POEPH_7_UNIT 2
CDWR Lake Oroville River Units	35.HYATT_2_UNIT 1 36.HYATT_2_UNIT 2 37.HYATT_2_UNIT 3 38.HYATT_2_UNIT 4	39.HYATT_2_UNIT 5 40.HYATT_2_UNIT 6 41.THERMA_2_UNIT 1 42.THERMA_2_UNIT 2	43.THERMA_2_UNIT 3 44.THERMA_2_UNIT 4
YCWA North Yuba River and South Feather River Units	45.WDLEAF_7_UNIT 1 46.FORBST_7_UNIT 1 47.SLYCRK_1_UNIT 1	48.KELYRG_6_UNIT 49.OROVIL_6_UNIT 50.COLGAT_7_UNIT 1	51.COLGAT_7_UNIT 2 52.NAROW1_2_UNIT 53.NAROW2_2_UNIT
Colusa	54.COLUSA_2_PL1X3		
Hatchet Ridge Wind Farm	55.HATRDG_2_WIND		
Bogue Generation	56.BOGUE_1_UNITA1		
Pease 60 kV Generation	58.YUBACT_1_SUNSWT 59.YUBACT_6_UNITA1 60.GRNLF2_1_UNIT		

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River System	Resource ID		
Drum Area Generation [Middle Fork Drum 1-5, Dutch Flat 1-2, Chicago Park, etc.]	61.MDFKRL_2_PROJCT 62.DRUM_7_PL1X2 63.DRUM_7_PL3X4 64.DRUM_7_UNIT 5 65.DUTCH1_7_UNIT 1	66.DUTCH2_7_UNIT 1 67.CHICPK_7_UNIT 1	
Lodi Generation	68. LODIEC_2_PL1X2	69. STIGCT_2_LODI	70. LODI25_2_UNIT 1
Bellota Generation	71. TIGRCK_7_UNITS	72. ELECTR_7_PL1X3	73. COLVIL_7_PL1X2
COI	74. MALIN500		

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6140 - Effectiveness Factors for the Northwest Control Area (COI/Path 66): (version 7.1, 2/22/24)

Table 3A: Generation Effectiveness Factors: Contingency Operations Flow Limits


Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Pit River System	COI	Colusa	Hatchet Ridge Wind	Shasta Units 1-4	Rest of CVP Generation
	PIT1_7_UNIT 1, PIT1_7_UNIT 2 , PIT3_7_PL1X3, PIT4_7_PL1X2, PIT5_7_PL1X2, PIT5_7_PL3X4 PIT6_7_UNIT 1, PIT6_7_UNIT 2, PIT7_7_UNIT 1, PIT7_7_UNIT 2, BLACK_7_UNIT 1, BLACK_7_UNIT 2		COLUSA_2 _PL1X3	HATRDG_2_ WIND	WASN Generation	WASN Generation
Control Points ↓						
CP #2a 0.7* Cottonwood – Olinda 230 kV #2 (→ @ Cottonwood) + Cottonwood - Olinda 230 kV #1 (→ @ Cottonwood)	13-17	9	13	14	23	-16 to -10
CP #2b 0.7* Cottonwood – Olinda 230 kV #1 (→ @ Cottonwood) + Cottonwood - Olinda 230 kV #2 (→ @ Cottonwood)	13-17	9	13	14	23	-16 to -10
CP #2c 0.03 * Olinda – Tracy 500 kV (→ @ Olinda) + Table Mountain – Vaca (→ @ Table Mountain)	N/A	N/A	N/A	N/A	N/A	N/A
CP #2d 0.07*Olinda – Tracy + 0.81*Round Mountain – Table Mountain #1 500 kV (→, @Round) + Round Mountain – Table Mountain #2 500 kV (→, @Round)	N/A	N/A	N/A	N/A	N/A	N/A

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Control Points ↓ Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Pit River System	COI	Colusa	Hatchet Ridge Wind	Shasta Units 1-4	Rest of CVP Generation
	PIT1_7_UNIT 1, PIT1_7_UNIT 2 , PIT3_7_PL1X3, PIT4_7_PL1X2, PIT5_7_PL1X2, PIT5_7_PL3X4 PIT6_7_UNIT 1, PIT6_7_UNIT 2, PIT7_7_UNIT 1, PIT7_7_UNIT 2, BLACK_7_UNIT 1, BLACK_7_UNIT 2		COLUSA_2_PL1X3	HATRDG_2_WIND	WASN Generation	WASN Generation
CP #3a 0.19* Captain Jack – Olinda 500 kV (→ @ Captain Jack) + Cottonwood – Olinda 230 kV #2 (→ @ Cottonwood)	13-17	8	13	14	23	-16 to -10
CP #3b 0.51 * Round Mountain 500/2330 kV Bank (→ @500) Cottonwood - Olinda #2 230 kV (→ @ Cottonwood)	46	N/A	24	46	27	20
CP #3c 0.19* Captain Jack – Olinda 500 kV (→ @ Captain Jack) + Cottonwood – Olinda 230 kV #1 (→ @ Cottonwood)	13-17	8	13	14	23	-16 to -10
CP #3d 0.51 * Round Mountain 500/2330 kV Bank (→ @500) Cottonwood - Olinda #1 230 kV (→ @ Cottonwood)	46	N/A	24	46	27	20
CP #3e 0.03 * Olinda – Tracy 500 kV (→ @ Olinda) + Table Mountain – Vaca (→ @ Table Mountain)	N/A	N/A	N/A	N/A	N/A	N/A

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Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Pit River System	COI	Colusa	Hatchet Ridge Wind	Shasta Units 1-4	Rest of CVP Generation
	PIT1_7_UNIT 1, PIT1_7_UNIT 2 , PIT3_7_PL1X3, PIT4_7_PL1X2, PIT5_7_PL1X2, PIT5_7_PL3X4 PIT6_7_UNIT 1, PIT6_7_UNIT 2, PIT7_7_UNIT 1, PIT7_7_UNIT 2, BLACK_7_UNIT 1, BLACK_7_UNIT 2		COLUSA_2_PL1X3	HATRDG_2_WIND	WASN Generation	WASN Generation
CP #3f 0.07*Olinda – Tracy + 0.81*Round Mountain – Table Mountain #1 500 kV (→, @Round) + Round Mountain – Table Mountain #2 500 kV (→, @Round)	N/A	N/A	N/A	N/A	N/A	N/A
CP #4a 0.7* Cottonwood – Olinda 230 kV #2 (→ @ Cottonwood) + Cottonwood - Olinda 230 kV #1 (→ @ Cottonwood)	13-17	9	13	14	23	-16 to -10
CP #4b 0.01 * Olinda – Tracy 500 kV (→ @ Olinda) + Delevan – Cortina 230 kV	N/A	N/A	N/A	N/A	N/A	N/A
CP #4c 0.08 * Olinda – Tracy 500 kV (→ @ Olinda) + Table Mountain – Vaca (→ @ Table Mountain)	N/A	N/A	N/A	N/A	N/A	N/A
CP #4d 0.14*Olinda – Tracy + 0.81*Round Mountain – Table Mountain #1 500 kV (→, @Round) + Round Mountain – Table Mountain #2 500 kV (→, @Round)	N/A	N/A	N/A	N/A	N/A	N/A

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Effectiveness Factors - All		Distribution Restriction: None


CP #4e 0.75 * [Round Mt-Cottonw ood #230 kV line (→,@Round) + Round Mt-Cottonw ood #3 230 kV line (→,@Round)] + Round Mt-Cottonw ood #1 230 kV line (→,@Round)	70-75	N/A	N/A	65	N/A	N/A
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Table 3B: Generation Effectiveness Factors: Normal Operations Flow Limits

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.						
	Pit River System	COI	Bypassing series caps on Olinda – Tracy 500 kV	Colusa	Hatchet Ridge Wind	Shasta Units 1-4	Rest of CVP Generation
	PIT1_7_UNIT 1, PIT1_7_UNIT 2, PIT3_7_PL1X3, PIT4_7_PL1X2, PIT5_7_PL1X2, PIT5_7_PL3X4, PIT6_7_UNIT 1, PIT6_7_UNIT 2, PIT7_7_UNIT 1, PIT7_7_UNIT 2, BLACK_7_UNIT 1, BLACK_7_UNIT 2			COLUSA_2_PL1X3	HATRDG_2_WIND	WASN Generation	WASN Generation
CP #1a 0.23*Captain Jack – Olinda 500 kV (→ @ Captain Jack) + Cottonw ood - Olinda #1 230 kV (→ @ Cottonw ood) + Cottonw ood - Olinda #2 230 kV (→ @ Cottonw ood)	10	10	9	10	10	23	-16 to -10
CP #1b 0.6 * Round Mountain 500/2330 kV Bank (→ @500) + Cottonw ood - Olinda #1 230 kV (→ @ Cottonw ood) + Cottonw ood - Olinda #2 230 kV (→ @ Cottonw ood)	46	N/A	4	24	46	27	20

Note: The effectiveness of bypassing series caps is provided for a 100 MW flow on the Olinda-Tracy 500 kV line (→ @Olinda)

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Effectiveness Factors - All		Distribution Restriction: None

6140A - Effectiveness Factors for the Northwest Control Area – PG&E: (version 2.2, 2/22/24)

Table 3A: Generation Effectiveness Factors: Contingency Operations Flow Limits

	MW increase in the calculated loading across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.			
	Upper Pit River System	Lower Pit River System	Hatchet Ridge Wind	Colusa
Resource IDs → Control Points ↓	PIT1_7_UNIT 1, PIT1_7_UNIT 2, PIT3_7_PL1X3,	PIT4_7_PL1X2, PIT5_7_PL1X2, PIT5_7_PL3X4 PIT6_7_UNIT 1, PIT6_7_UNIT 2, PIT7_7_UNIT 1, PIT7_7_UNIT 2, BLACK_7_UNIT 1, BLACK_7_UNIT 2	HATRDG_2_WIND	COLUSA_2_PL1X3
CP #2a 0.45 * Round Mt-Cottonwood #1 230 kV line (→, @Round) + Round Mt-Cottonwood #2 230 kV line (→, @Round)	23	43	42	N/A
CP #2b 0.45 * Round Mt-Cottonwood #1 230 kV line (→, @Round) + Round Mt-Cottonwood #3 230 kV line (→, @Round)	23	42	33	N/A
CP #2c 0.25 * Delevan - Vaca 230 kV #2 (→ @ Delevan) + Delevan - Cortina 230 kV (→ @ Delevan)	20	20	20	26

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Effectiveness Factors - All		Distribution Restriction: None

Table 3B: Generation Effectiveness Factors: Normal Operations Flow Limits

Control Points ↓ Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	HUMBPP_6_UNITS1, HUMBPP_6_UNITS2, HUMBPP_1_UNITS3, FAIRHV_6_UNIT, PACLUM_6_UNIT	LAPAC_6_UNIT , BLULKE_6_BLUELK	Cascade Imports	SMPAND_7_UNIT, WSENGY_1_UNIT 1, LEWSTN_7_WEBRFL,	COLEMN_2_UNIT, INSKIP_2_UNIT, SOUTH_2_UNIT, VOLTA_2_UNIT 1, VOLTA_2_UNIT 2, VOLTA_7_QFUNTS
CP #1a 0.87*Cottonwood 230/115 BK4 (←) + Cottonwood 230/115 BK1 (←)	72-68	72	65	82-73	N/A
CP #1b 0.87*Cottonwood 230/115 BK4 (→) + Cottonwood 230/115 BK1 (→)	-72 to -68	-72	-65	-82 to -73	N/A
CP #1c 0.95*Cottonwood 230/115 BK1 (←) + Cottonwood 230/115 BK4 (←)	72-68	72	65	82-73	N/A
CP #1d 0.95*Cottonwood 230/115 BK1 (→) + Cottonwood 230/115 BK4 (→)	-72 to -68	-72	-65	-82 to -73	N/A

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Effectiveness Factors - All		Distribution Restriction: None	

6310 - Effectiveness Factors for Path 15 (Midway – Los Banos): (version 26.2, 10/10/24)

Table 4 - Part 1: Generation Effectiveness Factors: Contingency Operations

Resource IDs →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	San Luis PGP	GWF Trcy1&2 Stanislaus Ralston Middle Fork Tiger Crk Electra Salt Spring Lodi EC	C.Costa 6&7 Gateway Geys 11-20	LMEC DEC Lambie Creed Goosehaven Wolfskill Calpeak(Vaca)	Cresta, Poe Rock Crk Bucks Crk Belden Drum 1-5 Dtch Flt 1-2 Chicago Pk	Donnells Beardsley Spring Gap Sand Bar Tulluch Pac Ult Pwr	YCEC FREC Colgate 1&2	Hyatt Thermalito Woodleaf Forbestown Sly Creek Caribou 4&5 JB Black 1&2	Wellhead (Panoche) Calpeak (Panoche)
	SLUIISP_2_UNITS	SCHLTE_1_UNITA1 SCHLTE_1_UNITA2 STANIS_1_UNIT MDFKRL_2_PROJCT TIGRCK_7_UNITS ELECTR_7_PL1x3 SALTSP_7_UNITS	GATWAY_2_PL1X3 GEYS11_7_UNIT11 GEYS12_7_UNIT12 GEYS13_7_UNIT13 GEYS14_7_UNIT14 GEYS16_7_UNIT16 GEYS17_2_BOTRCK GEYS17_7_UNIT17 GEYS18_7_UNIT18 GEYS20_7_UNIT20	LMEC_1_PL1X3 DELTA_2_PL1X4 LMBEPK_2_UNITA1 LMBEPK_2_UNITA2 LMBEPK_2_UNITA3 WOLFSK_1_UNITA1 VACADX_1_UNITA1	CRESTA_7_PL1X2 RCKCRK_7_UNIT 1 RCKCRK_7_UNIT 2 BUCKCK_7_PL1X2 BELDEN_7_UNIT 1 DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT 5 DUTCH1_7_UNIT 1 DUTCH2_7_UNIT 2 CHICPK_7_UNIT 1	DONNLS_7_UNIT BEARDS_7_UNIT 1 SPRGAP_1_UNIT 1 SNDBAR_7_UNIT 1 TULLCK_7_UNITS ULTPCH_1_UNIT 1	YUBACT_6_UNITA1 BOGUE_1_UNITA1 COLGAT_7_UNIT 1 COLGAT_7_UNIT 2	HYTTM_2_UNITS WDLEAF_7_UNIT 1 FORBST_7_UNIT 1 SLYCRK_1_UNIT 1 CARBOU_7_PL4X5 BLACK_7_UNIT 1 BLACK_7_UNIT 2	PNOCHE_1_PL1X2 PNOCHE_1_UNITA1
Control Points↓									
CP #1 0.14*Los Banos-Tesla (->, @Los Banos) + Los Banos-Quinto (->, @Los Banos)	20	-14	-8	-8	-7	-7	-7	-7	10
CP #2 0.24* Los Banos-Tesla (<-, @Los Banos) +0.24* Los Banos-Tracy (<-, @Los Banos) +LosBanos-Quinto (<-, @LosBanos)	-19	14	14	14	14	14	14	14	-10

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Effectiveness Factors - All

**Distribution Restriction:
None**

Resource IDs →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	San Luis PGP	GWF Trcy1&2 Stanislaus Ralston Middle Fork Tiger Crk Electra Salt Spring Lodi EC	C.Costa 6&7 Gateway Geys 11-20	LMEC DEC Lambie Creed Goosehaven Wolfskill Calpeak(Vaca)	Cresta, Poe Rock Crk Bucks Crk Belden Drum 1-5 Dtch Flt 1-2 Chicago Pk	Donnells Beardsley Spring Gap Sand Bar Tulluch Pac Ult Pwr	YCEC FREC Colgate 1&2	Hyatt Thermalito Woodleaf Forbestown Sly Creek Caribou 4&5 JB Black 1&2	Wellhead (Panoche) Calpeak (Panoche)
	SLUIISP_2_ UNITS	SCHLTE_1_ UNITA1 SCHLTE_1_ UNITA2 STANIS_1_UNIT MDFKRL_2_PROJECT TIGRCK_7_UNITS ELECTR_7_PL1x3 SALTSP_7_UNITS	GATWAY_2_PL1X3 GEYS11_7_UNIT11 GEYS12_7_UNIT12 GEYS13_7_UNIT13 GEYS14_7_UNIT14 GEYS16_7_UNIT16 GEYS17_2_BOTRCK GEYS17_7_UNIT17 GEYS18_7_UNIT18 GEYS20_7_UNIT20	LMEC_1_PL1X3 DELTA_2_PL1X4 LMBEPK_2_UNITA1 LMBEPK_2_UNITA2 LMBEPK_2_UNITA3 WOLFSK_1_UNITA1 VACADX_1_UNITA1	CRESTA_7_PL1X2 RCKCRK_7_UNIT 1 RCKCRK_7_UNIT 2 BUCKCK_7_PL1X2 BELDEN_7_UNIT 1 DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT 5 DUTCH1_7_UNIT 1 DUTCH2_7_UNIT 2 CHICPK_7_UNIT 1	DONNLS_7_UNIT BEARDS_7_UNIT 1 SPRGAP_1_UNIT 1 SNDBAR_7_UNIT 1 TULLCK_7_UNITS ULTPCH_1_UNIT 1	YUBACT_6_UNI TA1 BOGUE_1_UNI TA1 COLGAT_7_UNI T 1 COLGAT_7_UNI T 2	HYTTHM_2_UNITS WDLEAF_7_UNIT 1 FORBST_7_UNIT 1 SLYCRK_1_UNIT 1 CARBOU_7_PL4X5 BLACK_7_UNIT 1 BLACK_7_UNIT 2	PNOCHE_1 _PL1X2 PNOCHE_1 _UNITA1
Control Points ↓									
CP #3 0.06* Los Banos-Tesla (<-, @Los Banos) +0.06* Los Banos-Tracy (<-, @Los Banos) +Warnerville-Wilson (->, @Wilson)	-18	11	5	5	5	5	5	5	-4
CP #4 0.07*Los Banos-Midway #2 (->, @Los Banos) +0.07*Los Banos-Gates (->, @Los Banos) +Panoche-Gates #1 (->, @Panoche)	10	7	5	5	5	5	5	5	16

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Effectiveness Factors - All

**Distribution Restriction:
None**

Resource IDs → Control Points↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	San Luis PGP	GWF Trcy1&2 Stanislaus Ralston Middle Fork Tiger Crk Electra Salt Spring Lodi EC	C.Costa 6&7 Gateway Geys 11-20	LMEC DEC Lambie Creed Goosehaven Wolfskill Calpeak(Vaca)	Cresta, Poe Rock Crk Bucks Crk Belden Drum 1-5 Dtch Flt 1-2 Chicago Pk	Donnells Beardsley Spring Gap Sand Bar Tulluch Pac Ult Pwr	YCEC FREC Colgate 1&2	Hyatt Thermalito Woodleaf Forbestown Sly Creek Caribou 4&5 JB Black 1&2	Wellhead (Panoche) Calpeak (Panoche)
	SLUIISP_2_ UNITS	SCHLTE_1_ UNITA1 SCHLTE_1_ UNITA2 STANIS_1_UNIT MDFKRL_2_PROJECT TIGRCK_7_UNITS ELECTR_7_PL1x3 SALTSP_7_UNITS	GATWAY_2_PL1X3 GEYS11_7_UNIT11 GEYS12_7_UNIT12 GEYS13_7_UNIT13 GEYS14_7_UNIT14 GEYS16_7_UNIT16 GEYS17_2_BOTRCK GEYS17_7_UNIT17 GEYS18_7_UNIT18 GEYS20_7_UNIT20	LMEC_1_PL1X3 DELTA_2_PL1X4 LMBEPK_2_UNITA1 LMBEPK_2_UNITA2 LMBEPK_2_UNITA3 WOLFSK_1_UNITA1 VACADX_1_UNITA1	CRESTA_7_PL1X2 RCKCRK_7_UNIT 1 RCKCRK_7_UNIT 2 BUCKCK_7_PL1X2 BELDEN_7_UNIT 1 DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT 5 DUTCH1_7_UNIT 1 DUTCH2_7_UNIT 2 CHICPK_7_UNIT 1	DONNLS_7_UNIT BEARDS_7_UNIT 1 SPRGAP_1_UNIT 1 SNDBAR_7_UNIT 1 TULLCK_7_UNITS ULTPCH_1_UNIT 1	YUBACT_6_UNI TA1 BOGUE_1_UNI TA1 COLGAT_7_UNI T 1 COLGAT_7_UNI T 2	HYTTHM_2_UNITS WDLEAF_7_UNIT 1 FORBST_7_UNIT 1 SLYCRK_1_UNIT 1 CARBOU_7_PL4X5 BLACK_7_UNIT 1 BLACK_7_UNIT 2	PNOCHE_1_PL1X2 PNOCHE_1_UNITA1
CP #5 0.11*Los Banos-Midw ay #2 (->, @Los Banos) +0.11*Gates-Midw ay 500 kV (->, @Gates) +Gates-Midw ay 230 (->, @Gates)	8	7	7	7	7	7	7	7	9
CP #6 LosBanos-Quinto (->, @LosBanos) +0.25*Los Banos-Tesla 500(->, @Los Banos) +0.25*Los Banos-Tracy 500(->, @Los Banos) -0.12*IRAS Gen -0.12*IRAS Load	30	0	-12	-12	-12	-12	-12	-12	18

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Effectiveness Factors - All

**Distribution Restriction:
None**

MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation									
Resource IDs →	San Luis PGP	GWF Trcy1&2 Stanislaus Ralston Middle Fork Tiger Crk Electra Salt Spring Lodi EC	C.Costa 6&7 Gateway Geys 11-20	LMEC DEC Lambie Creed Goosehaven Wolfskill Calpeak(Vaca)	Cresta, Poe Rock Crk Bucks Crk Belden Drum 1-5 Dtch Flt 1-2 Chicago Pk	Donnells Beardsley Spring Gap Sand Bar Tulluch Pac Ult Pwr	YCEC FREC Colgate 1&2	Hyatt Thermalito Woodleaf Forbestown Sly Creek Caribou 4&5 JB Black 1&2	Wellhead (Panoche) Calpeak (Panoche)
Control Points↓	SLUI SP_2_ UNITS	SCHLTE_1_ UNITA1 SCHLTE_1_ UNITA2 STANIS_1_ UNIT MDFKRL_2_ PROJECT TIGRCK_7_ UNITS ELECTR_7_ PL1x3 SALTSP_7_ UNITS	GATWAY_2_ PL1X3 GEYS11_7_ UNIT11 GEYS12_7_ UNIT12 GEYS13_7_ UNIT13 GEYS14_7_ UNIT14 GEYS16_7_ UNIT16 GEYS17_2_ BOTRCK GEYS17_7_ UNIT17 GEYS18_7_ UNIT18 GEYS20_7_ UNIT20	LMEC_1_ PL1X3 DELTA_2_ PL1X4 LMBEPK_2_ UNITA1 LMBEPK_2_ UNITA2 LMBEPK_2_ UNITA3 WOLFSK_1_ UNITA1 VACADX_1_ UNITA1	CRESTA_7_ PL1X2 RCKCRK_7_ UNIT 1 RCKCRK_7_ UNIT 2 BUCKCK_7_ PL1X2 BELDEN_7_ UNIT 1 DRUM_7_ PL1X2 DRUM_7_ PL3X4 DRUM_7_ UNIT 5 DUTCH1_7_ UNIT 1 DUTCH2_7_ UNIT 2 CHICPK_7_ UNIT 1	DONNLS_7_ UNIT BEARDS_7_ UNIT 1 SPRGAP_1_ UNIT 1 SNDBAR_7_ UNIT 1 TULLCK_7_ UNITS ULTPCH_1_ UNIT 1	YUBACT_6_ UNI TA1 BOGUE_1_ UNI TA1 COLGAT_7_ UNI T 1 COLGAT_7_ UNI T 2	HYTTHM_2_ UNITS WDLEAF_7_ UNIT 1 FORBST_7_ UNIT 1 SLYCRK_1_ UNIT 1 CARBOU_7_ PL4X5 BLACK_7_ UNIT 1 BLACK_7_ UNIT 2	PNOCHE_1_ PL1X2 PNOCHE_1_ UNITA1
CP #7 Panoche-Gates #1 230 (<-, @Panoche) +0.07*Los Banos-Midway #2 500 (<-, @Midway) +0.07*Los Banos-Gates #1 500 (<-, @Gates) -0.05*IRAS Gen -0.03*IRAS Load -0.03*IRAS Helm Pump	-7	0	-4	-4	-4	-4	-4	-4	-13

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Effectiveness Factors - All

Distribution Restriction: None

MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation									
Resource IDs →	San Luis PGP	GWF Tracy1&2 Stanislaus Ralston Middle Fork Tiger Crk Electra Salt Spring Lodi EC	C.Costa 6&7 Gateway Geys 11-20	LMEC DEC Lambie Creed Goosehaven Wolfskill Calpeak(Vaca)	Cresta, Poe Rock Crk Bucks Crk Belden Drum 1-5 Dtch Flt 1-2 Chicago Pk	Donnells Beardsley Spring Gap Sand Bar Tulluch Pac Ult Pwr	YCEC FREC Colgate 1&2	Hyatt Thermalito Woodleaf Forbestown Sly Creek Caribou 4&5 JB Black 1&2	Wellhead (Panoche) Calpeak (Panoche)
Control Points↓	SLUIISP_2_ UNITS	SCHLTE_1_ UNITA1 SCHLTE_1_ UNITA2 STANIS_1_ UNIT MDFKRL_2_ PROJECT TIGRCK_7_ UNITS ELECTR_7_ PL1x3 SALTSP_7_ UNITS	GATWAY_2_ PL1X3 GEYS11_7_ UNIT11 GEYS12_7_ UNIT12 GEYS13_7_ UNIT13 GEYS14_7_ UNIT14 GEYS16_7_ UNIT16 GEYS17_2_ BOTRCK GEYS17_7_ UNIT17 GEYS18_7_ UNIT18 GEYS20_7_ UNIT20	LMEC_1_ PL1X3 DELTA_2_ PL1X4 LMBEPK_2_ UNITA1 LMBEPK_2_ UNITA2 LMBEPK_2_ UNITA3 WOLFSK_1_ UNITA1 VACADX_1_ UNITA1	CRESTA_7_ PL1X2 RCKCRK_7_ UNIT 1 RCKCRK_7_ UNIT 2 BUCKCK_7_ PL1X2 BELDEN_7_ UNIT 1 DRUM_7_ PL1X2 DRUM_7_ PL3X4 DRUM_7_ UNIT 5 DUTCH1_7_ UNIT 1 DUTCH2_7_ UNIT 2 CHICPK_7_ UNIT 1	DONNLS_7_ UNIT BEARDS_7_ UNIT 1 SPRGAP_1_ UNIT 1 SNDBAR_7_ UNIT 1 TULLCK_7_ UNITS ULTPCH_1_ UNIT 1	YUBACT_6_ UNI TA1 BOGUE_1_ UNI TA1 COLGAT_7_ UNI T 1 COLGAT_7_ UNI T 2	HYTTHM_2_ UNITS WDLEAF_7_ UNIT 1 FORBST_7_ UNIT 1 SLYCRK_1_ UNIT 1 CARBOU_7_ PL4X5 BLACK_7_ UNIT 1 BLACK_7_ UNIT 2	PNOCHE_1_ PL1X2 PNOCHE_1_ UNITA1
CP #8 Gates Bank 11 500/230 (->,@ 230 kV) +0.2*Los Banos-Gates #1 500 kV (<,@Gates) +0.13*Los Banos-Midway #2 500 kV (<,@Midway) +0.03*IRAS Gen -0.07*IRAS Load -0.3*IRAS Helm Pump	-13	0	-7	-7	-7	-7	-7	-7	-27

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Distribution Restriction: None

Resource IDs →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	San Luis PGP	GWF Trcy1&2 Stanislaus Ralston Middle Fork Tiger Crk Electra Salt Spring Lodi EC	C.Costa 6&7 Gateway Geys 11-20	LMEC DEC Lambie Creed Goosehaven Wolfskill Calpeak(Vaca)	Cresta, Poe Rock Crk Bucks Crk Belden Drum 1-5 Dtch Flt 1-2 Chicago Pk	Donnells Beardsley Spring Gap Sand Bar Tulluch Pac Ult Pwr	YCEC FREC Colgate 1&2	Hyatt Thermalito Woodleaf Forbestown Sly Creek Caribou 4&5 JB Black 1&2	Wellhead (Panoche) Calpeak (Panoche)
	SLUIISP_2_ UNITS	SCHLTE_1_ UNITA1 SCHLTE_1_ UNITA2 STANIS_1_UNIT MDFKRL_2_PROJECT TIGRCK_7_UNITS ELECTR_7_PL1x3 SALTSP_7_UNITS	GATWAY_2_PL1X3 GEYS11_7_UNIT11 GEYS12_7_UNIT12 GEYS13_7_UNIT13 GEYS14_7_UNIT14 GEYS16_7_UNIT16 GEYS17_2_BOTRCK GEYS17_7_UNIT17 GEYS18_7_UNIT18 GEYS20_7_UNIT20	LMEC_1_PL1X3 DELTA_2_PL1X4 LMBEPK_2_UNITA1 LMBEPK_2_UNITA2 LMBEPK_2_UNITA3 WOLFSK_1_UNITA1 VACADX_1_UNITA1	CRESTA_7_PL1X2 RCKCRK_7_UNIT 1 RCKCRK_7_UNIT 2 BUCKCK_7_PL1X2 BELDEN_7_UNIT 1 DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT 5 DUTCH1_7_UNIT 1 DUTCH2_7_UNIT 2 CHICPK_7_UNIT 1	DONNLS_7_UNIT BEARDS_7_UNIT 1 SPRGAP_1_UNIT 1 SNDBAR_7_UNIT 1 TULLCK_7_UNITS ULTPCH_1_UNIT 1	YUBACT_6_UNI TA1 BOGUE_1_UNI TA1 COLGAT_7_UNI T 1 COLGAT_7_UNI T 2	HYTTHM_2_UNITS WDLEAF_7_UNIT 1 FORBST_7_UNIT 1 SLYCRK_1_UNIT 1 CARBOU_7_PL4X5 BLACK_7_UNIT 1 BLACK_7_UNIT 2	PNOCHE_1 _PL1X2 PNOCHE_1 _UNITA1
Control Points ↓									
CP #9 Gates-Midw ay 230 (<-,Midw ay) +0.11*Los Banos- Midw ay #2 500 (<-,@Midw ay) +0.11*Gates-Midw ay 500 (->,@Midw ay) -0.1*IRAS Gen -0.05*IRAS Load -0.07*IRAS Helm Pump	-5	0	-5	-5	-5	-5	-5	-5	-5
CP #10 0.70*Los Banos-Midw ay #2 (<-, @Midw ay) +Gates-Midw ay 500 (<-, @Midw ay)	-14	-14	-14	-14	-14	-14	-14	-14	-14

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Effectiveness Factors - All

**Distribution Restriction:
None**

MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation									
Resource IDs →	San Luis PGP	GWF Tracy1&2 Stanislaus Ralston Middle Fork Tiger Crk Electra Salt Spring Lodi EC	C.Costa 6&7 Gateway Geys 11-20	LMEC DEC Lambie Creed Goosehaven Wolfskill Calpeak(Vaca)	Cresta, Poe Rock Crk Bucks Crk Belden Drum 1-5 Dtch Flt 1-2 Chicago Pk	Donnells Beardsley Spring Gap Sand Bar Tulluch Pac Ult Pwr	YCEC FREC Colgate 1&2	Hyatt Thermalito Woodleaf Forbestown Sly Creek Caribou 4&5 JB Black 1&2	Wellhead (Panoche) Calpeak (Panoche)
Control Points↓	SLUIISP_2_ UNITS	SCHLTE_1_ UNITA1 SCHLTE_1_ UNITA2 STANIS_1_ UNIT MDFKRL_2_ PROJECT TIGRCK_7_ UNITS ELECTR_7_ PL1x3 SALTSP_7_ UNITS	GATWAY_2_ PL1X3 GEYS11_7_ UNIT11 GEYS12_7_ UNIT12 GEYS13_7_ UNIT13 GEYS14_7_ UNIT14 GEYS16_7_ UNIT16 GEYS17_2_ BOTRCK GEYS17_7_ UNIT17 GEYS18_7_ UNIT18 GEYS20_7_ UNIT20	LMEC_1_ PL1X3 DELTA_2_ PL1X4 LMBEPK_2_ UNITA1 LMBEPK_2_ UNITA2 LMBEPK_2_ UNITA3 WOLFSK_1_ UNITA1 VACADX_1_ UNITA1	CRESTA_7_ PL1X2 RCKCRK_7_ UNIT 1 RCKCRK_7_ UNIT 2 BUCKCK_7_ PL1X2 BELDEN_7_ UNIT 1 DRUM_7_ PL1X2 DRUM_7_ PL3X4 DRUM_7_ UNIT 5 DUTCH1_7_ UNIT 1 DUTCH2_7_ UNIT 2 CHICPK_7_ UNIT 1	DONNLS_7_ UNIT BEARDS_7_ UNIT 1 SPRGAP_1_ UNIT 1 SNDBAR_7_ UNIT 1 TULLCK_7_ UNITS ULTPCH_1_ UNIT 1	YUBACT_6_ UNI TA1 BOGUE_1_ UNI TA1 COLGAT_7_ UNI T 1 COLGAT_7_ UNI T 2	HYTTHM_2_ UNITS WDLEAF_7_ UNIT 1 FORBST_7_ UNIT 1 SLYCRK_1_ UNIT 1 CARBOU_7_ PL4X5 BLACK_7_ UNIT 1 BLACK_7_ UNIT 2	PNOCHE_1_ PL1X2 PNOCHE_1_ UNITA1
CP #11 Dos Amigos Pumping Plant - Panoche 230 (<-, @Panoche) +0.05*Los Banos-Midway #2 500 (<-, @Midway) +0.05*Los Banos-Gates #1 500 (<-, @Gates) -0.04*IRAS Gen -0.01*IRAS Load +0.07*IRAS Helm Pump	-8	0	0	0	0	0	0	0	10

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Procedure No.	2210Z
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Effectiveness Factors - All

**Distribution Restriction:
None**

MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation									
Resource IDs →	San Luis PGP	GWF Trcy1&2 Stanislaus Ralston Middle Fork Tiger Crk Electra Salt Spring Lodi EC	C.Costa 6&7 Gateway Geys 11-20	LMEC DEC Lambie Creed Goosehaven Wolfskill Calpeak(Vaca)	Cresta, Poe Rock Crk Bucks Crk Belden Drum 1-5 Dtch Flt 1-2 Chicago Pk	Donnells Beardsley Spring Gap Sand Bar Tulluch Pac Ult Pwr	YCEC FREC Colgate 1&2	Hyatt Thermalito Woodleaf Forbestown Sly Creek Caribou 4&5 JB Black 1&2	Wellhead (Panoche) Calpeak (Panoche)
Control Points↓	SLUIISP_2_UNITS	SCHLTE_1_UNITA1 SCHLTE_1_UNITA2 STANIS_1_UNIT MDFKRL_2_PROJECT TIGRCK_7_UNITS ELECTR_7_PL1x3 SALTSP_7_UNITS	GATWAY_2_PL1X3 GEYS11_7_UNIT11 GEYS12_7_UNIT12 GEYS13_7_UNIT13 GEYS14_7_UNIT14 GEYS16_7_UNIT16 GEYS17_2_BOTRCK GEYS17_7_UNIT17 GEYS18_7_UNIT18 GEYS20_7_UNIT20	LMEC_1_PL1X3 DELTA_2_PL1X4 LMBEPK_2_UNITA1 LMBEPK_2_UNITA2 LMBEPK_2_UNITA3 WOLFSK_1_UNITA1 VACADX_1_UNITA1	CRESTA_7_PL1X2 RCKCRK_7_UNIT 1 RCKCRK_7_UNIT 2 BUCKCK_7_PL1X2 BELDEN_7_UNIT 1 DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT 5 DUTCH1_7_UNIT 1 DUTCH2_7_UNIT 2 CHICPK_7_UNIT 1	DONNLS_7_UNIT BEARDS_7_UNIT 1 SPRGAP_1_UNIT 1 SNDBAR_7_UNIT 1 TULLCK_7_UNITS ULTPCH_1_UNIT 1	YUBACT_6_UNI TA1 BOGUE_1_UNI TA1 COLGAT_7_UNI T 1 COLGAT_7_UNI T 2	HYTTHM_2_UNITS WDLEAF_7_UNIT 1 FORBST_7_UNIT 1 SLYCRK_1_UNIT 1 CARBOU_7_PL4X5 BLACK_7_UNIT 1 BLACK_7_UNIT 2	PNOCHE_1_PL1X2 PNOCHE_1_UNITA1
CP #12 LBN path flow (S->N)	17	-10	-8	-8	-8	-9	-8	-8	18
CP #13 and CP #14 Path15 flow (S->N)	-3	-3	-3	-3	-3	-3	-3	-3	-4

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Effectiveness Factors - All		Distribution Restriction: None

Table 4 - Part 2: Generation Effectiveness Factors: Contingency Operations (continued with Part 1)

Resource IDs → Control Points ↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	California Solar Ranch Topaz Solar	Elk Hill La Paloma Sunset Sunrise	HAAS Pine Flat Balch 230	Helms	Exchequer Chowchilla	Friant Wishon	Balch 115 Kings River Malaga	Moss Landing PB 1 & 2	DCPP
	CAVLSR_2_BSOLAR CAVLSR_2_RSOLAR TOPAZ_2_SOLAR	ELKHIL_2_PL1X3 LAPLMA_2_UNIT1 LAPLMA_2_UNIT2 LAPLMA_2_UNIT3 LAPLMA_2_UNIT4 SUNSET_2_UNNITS SUNRIS_2_P1X3	HAASPH_7_PL1X2 PINFLT_7_UNITS BALCHS_7_UNIT2 BALCHS_7_UNIT3	HELMPG_7_UNIT1 HELMPG_7_UNIT2 HELMPG_7_UNIT3	EXCHEC_7_UNIT1 CHWCHL_1_BIOMAS CHWCHL_1_UNIT	FRIANT_6_UNITS WISHON_6_UNITS	BALCHS_7_UNIT1 KINGRV_7_UNIT1 MALAGA_1_P1X2	MOSSLD_2_PSP1 MOSSLD_2_PSP2	DIABLO_7_UNIT1 DIABLO_7_UNIT2
CP #1 0.14* Los Banos-Tesla (->, @Los Banos) + Los Banos-Quinto (->, @Los Banos)	4	3	5	3	0	0	0	-2	3
CP #2 0.24* Los Banos-Tesla (<-, @Los Banos) +0.24* Los Banos-Tracy (<-, @Los Banos) +Los Banos-Quinto (<-, @Los Banos)	-5	-5	-5	-2	-5	-1	-1	3	-5
CP #3 0.06* Los Banos-Tesla (<-, @Los Banos) +0.06* Los Banos-Tracy (<-, @Los Banos) +Warnerville-Wilson (->, @Wilson)	-3	-2	-10	-18	-24	-20	-12	2	-2

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Effectiveness Factors - All

Distribution Restriction: None

Resource IDs →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	California Solar Ranch Topaz Solar	Elk Hill La Paloma Sunset Sunrise	HAAS Pine Flat Balch 230	Helm s	Exchequer Chowchilla	Friant Wishon	Balch 115 Kings River Malaga	Moss Landing PB 1 & 2	DCPP
	CAVLSR_2_BSOLAR CAVLSR_2_RSOLAR TOPAZ_2_SOLAR	ELKHIL_2_PL1X3 LAPLMA_2_UNIT1 LAPLMA_2_UNIT2 LAPLMA_2_UNIT3 LAPLMA_2_UNIT4 SUNSET_2_UNNITS SUNRIS_2_P1X3	HAASPH_7_PL1X2 PINFLT_7_UNITS BALCHS_7_UNIT2 BALCHS_7_UNIT3	HELM PG_7_UNIT1 HELM PG_7_UNIT2 HELM PG_7_UNIT3	EXCHEC_7_UNIT1 CHWCHL_1_BIOMAS CHWCHL_1_UNIT	FRIANT_6_UNITS WISHON_6_UNITS	BALCHS_7_UNIT1 KINGRV_7_UNIT1 MALAGA_1_P1X2	MOSSLD_2_PSP1 MOSSLD_2_PSP2	DIABLO_7_UNIT1 DIABLO_7_UNIT2
Control Points↓									
CP #5 0.11*Los Banos-Midw ay #2 (->, @Los Banos) +0.11*Gates-Midw ay 500 kV (->, @Gates) +Gates-Midw ay 230 (->, @Gates)	-4	-4	4	4	1	1	1	7	-3
CP #6 LosBanos-Quinto (->, @LosBanos) +0.25*Los Banos-Tesla 500 (->, @Los Banos) +0.25*Los Banos-Tracy 500 (->, @Los Banos) -0.12*IRAS Gen -0.12*IRAS Load	13	0	13	2	4	7	12	12	12

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Effectiveness Factors - All

Distribution Restriction: None

Resource IDs → Control Points↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	California Solar Ranch Topaz Solar	Elk Hill La Paloma Sunset Sunrise	HAAS Pine Flat Balch 230	Helms	Exchequer Chowchilla	Friant Wishon	Balch 115 Kings River Malaga	Moss Landing PB 1 & 2	DCPP
	CAVLSR_2_BSOLAR CAVLSR_2_RSOLAR TOPAZ_2_SOLAR	ELKHIL_2_PL1X3 LAPLMA_2_UNIT1 LAPLMA_2_UNIT2 LAPLMA_2_UNIT3 LAPLMA_2_UNIT4 SUNSET_2_UNNITS SUNRIS_2_P1X3	HAASPH_7_PL1X2 PINFLT_7_UNITS BALCHS_7_UNIT2 BALCHS_7_UNIT3	HELM PG_7_UNIT1 HELM PG_7_UNIT2 HELM PG_7_UNIT3	EXCHEC_7_UNIT1 CHWCHL_1_BIOMAS CHWCHL_1_UNIT	FRIANT_6_UNITS WISHON_6_UNITS	BALCHS_7_UNIT1 KINGRV_7_UNIT1 MALAGA_1_P1X2	MOSSLD_2_PSP1 MOSSLD_2_PSP2	DIABLO_7_UNIT1 DIABLO_7_UNIT2
CP #7 Panoche-Gates #1 230 (<-, @Panoche) +0.07*Los Banos-Midw ay #2 500 (<-, @Midw ay) +0.07*Los Banos-Gates #1 500 (<-, @Gates) -0.05*IRAS Gen -0.03*IRAS Load -0.03*IRAS Helm Pump	6	0	-5	-3	-4	-3	-4	-5	12
CP #8 Gates Bank 11 500/230 (->, @ 230 kV) +0.2*Los Banos-Gates #1 500 kV (<-, @Gates) +0.13*Los Banos-Midw ay #2 500 kV (<-, @Midw ay) +0.03*IRAS Gen -0.07*IRAS Load -0.3*IRAS Helm Pump	-14	0	-37	-30	-25	-31	-35	-9	4

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Effectiveness Factors - All

Distribution Restriction: None

Resource IDs → Control Points↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	California Solar Ranch Topaz Solar	Elk Hill La Paloma Sunset Sunrise	HAAS Pine Flat Balch 230	Helm s	Exchequer Chow chilla	Friant Wishon	Balch 115 Kings River Malaga	Moss Landing PB 1 & 2	DCPP
	CAVLSR_2_BSOLAR CAVLSR_2_RSOLAR TOPAZ_2_SOLAR	ELKHIL_2_PL1X3 LAPLMA_2_UNIT1 LAPLMA_2_UNIT2 LAPLMA_2_UNIT3 LAPLMA_2_UNIT4 SUNSET_2_UNNITS SUNRIS_2_P1X3	HAASPH_7_PL1X2 PINFLT_7_UNITS BALCHS_7_UNIT2 BALCHS_7_UNIT3	HELMPG_7_UNIT1 HELMPG_7_UNIT2 HELMPG_7_UNIT3	EXCHEC_7_UNIT1 CHWCHL_1_BIOMAS CHWCHL_1_UNIT	FRIANT_6_UNITS WISHON_6_UNITS	BALCHS_7_UNIT1 KINGRV_7_UNIT1 MALAGA_1_P1X2	MOSSL2_2_PSP1 MOSSL2_2_PSP2	DIABLO_7_UNIT1 DIABLO_7_UNIT2
CP #9 Gates-Midw ay 230 (<-,Midw ay) +0.11*Los Banos-Midw ay #2 500 (<-,@Midw ay) +0.11*Gates-Midw ay 500 (->,@Midw ay) -0.1*IRAS Gen -0.05*IRAS Load -0.07*IRAS Helm Pump	6	0	-8	-8	-7	-7	-8	-5	2
CP #10 0.70*Los Banos-Midw ay #2 (<-, @Midw ay) +Gates-Midw ay 500 (<-, @Midw ay)	25	36	-15	-15	-15	-15	-15	-20	23

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Effectiveness Factors - All

Distribution Restriction: None

Resource IDs → Control Points↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation								
	California Solar Ranch Topaz Solar	Elk Hill La Paloma Sunset Sunrise	HAAS Pine Flat Balch 230	Helms	Exchequer Chowchilla	Friant Wishon	Balch 115 Kings River Malaga	Moss Landing PB 1 & 2	D CPP
	CAVLSR_2_BSOLAR CAVLSR_2_RSOLAR TOPAZ_2_SOLAR	ELKHIL_2_PL1X3 LAPLMA_2_UNIT1 LAPLMA_2_UNIT2 LAPLMA_2_UNIT3 LAPLMA_2_UNIT4 SUNSET_2_UNNITS SUNRIS_2_P1X3	HAASPH_7_PL1X2 PINFLT_7_UNITS BALCHS_7_UNIT2 BALCHS_7_UNIT3	HELM PG_7_UNIT1 HELM PG_7_UNIT2 HELM PG_7_UNIT3	EXCHEC_7_UNIT1 CHWCHL_1_BIOMAS CHWCHL_1_UNIT	FRIANT_6_UNITS WISHON_6_UNITS	BALCHS_7_UNIT1 KINGRV_7_UNIT1 MALAGA_1_P1X2	MOSSL D_2_PSP1 MOSSL D_2_PSP2	DIABLO_7_UNIT1 DIABLO_7_UNIT2
CP #11 Dos Amigos Pumping Plant - Panoche 230 (<-, @Panoche) +0.05*Los Banos-Midway #2 500 (<-, @Midway) +0.05*Los Banos-Gates #1 500 (<-, @Gates) -0.04*IRAS Gen -0.01*IRAS Load +0.07*IRAS Helm Pump	4	4	8	8	8	8	8	0	3
CP #12 LBN path flow (S->N)	18	18	18	15	12	12	18	6	18
CP #13 and CP #14 Path15 flow (S->N)	8	13	-5	-5	-5	-5	-5	-4	4

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Effectiveness Factors - All		Distribution Restriction: None

6410 - Effectiveness Factors for Path 26 – Midway Vincent: (version 11.1, 11/01/24)

Table 2: Generation Effectiveness Factors


Resource Location → Control Points ↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation					
	SCE Big Creek Gen	SCE South of Magunden area, Metro area Gen	SCE Blythe-Mirage area, Devers area, North of Lugo area Gen	SCE Tehachapi area Gen	PGAE South area Gen	PGAE North area, Bay area Gen
CP #1	-89 to -91	-80 to -84	-73 to -78	-75 to -80	18 to 25	8 to 16
CP #2	-46	-42 to -45	-42 to -45	-30	8 to 12	4 to 7
CP #3	-89 to -91	-80 to -84	-73 to -78	-75 to -80	18 to 25	8 to 16
CP #4	-89 to -91	-80 to -84	-73 to -78	-75 to -80	18 to 25	8 to 16
CP #7	63	66 to 70	66 to 70	70 to 72	-13 to -19	-6 to -12
CP #8	65	66 to 73	66 to 73	66 to 73	-13 to -20	-6 to -12
CP #9	65	66 to 73	66 to 73	66 to 73	-13 to -20	-6 to -12
CP #12	-35 to -38	-35 to -38	-35 to -38	-35 to -38	8 to 12	4 to 7

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Effectiveness Factors - All		Distribution Restriction: None

Resource Location → Control Points ↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation					
	SCE Big Creek Gen	SCE South of Magunden area, Metro area Gen	SCE Blythe-Mirage area, Devers area, North of Lugo area Gen	SCE Tehachapi area Gen	PGAE South area Gen	PGAE North area, Bay area Gen
CP #13	-35 to -38	-35 to -38	-35 to -38	-35 to -38	8 to 12	4 to 7
CP #14	-32 to -35	-32 to -35	-32 to -35	-36 to -41	3 to 9	3 to 9

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		Effective Date	12/05/24
Effectiveness Factors - All		Distribution Restriction: None	

6610 - Effectiveness Factors for Lugo – Victorville (Path 61): (version 16.1, 11/01/24)

Table 3A: Path 61 Generation Effectiveness Factors

Unit →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.						
	High Desert	Eiwanda / Grapeland Peaker / Mira Loma Peaker	Mountain view /Sentinel 1-8	Sentinel 1-8	PGAE Gen	Big Creek /Pastoria	Ormond
Resource ID →	HIDSRT_2_UNITS	MIRLOM_6_PEAKER ETWWD_6_GRPLND	SBERDO_2_PSP3_PSP4	SENTNL_2_CTG1-8	Any Unit	BIGCRK_2_EXESWD LEBECS_2_UNITS	ORMOND_7_UNIT 1 ORMOND_7_UNIT 2
Path 61	-13	-9	-8	-5	-3	9 / 13	17

Notes:

- 1) These Effectiveness Factors were determined using the WECC system as a distributed slack bus.
- 2) Monitor the loading on South of Lugo because mitigation for the Lugo – Victorville 500 kV line Nomogram can increase the South of Lugo flow if High Desert, or PGAE Generation is increased.
- 3) Monitor the loading on the Sylmar transformer banks. Depending upon the flow on the Sylmar transformer banks, reducing generation at Ormond, Pastoria, or Big Creek may increase the Sylmar transformer bank loading.
- 4) The effectiveness factors are based on a normal steady-state condition, and may differ under real-time conditions.

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Effectiveness Factors - All		Distribution Restriction: None

Table 3B: Generation Effectiveness Factors with PDCI¹ Schedule Cuts

Unit →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.							
	High Desert	Grapeland Peaker / Mira Loma Peaker	Mountain view \ Etiwanda	PGAE Gen	Huntington Beach / Barre Peaker / Walnut Creek	Alamitos / Center Peaker	El Segundo / Long Beach	Buck Blvd / SDGE Gen
Resource ID →	HIDSRT_2_UNITS	ETIWND_6_GRPLND MIRLOM_6_PEAKEP	SBERDO_2_PSP3_PSP4 ETIWND_2_UNIT1	Any Unit	HNTGBH_2_PL1X3 HNTGBH_7_UNIT2 BARRE_6_PEAKEP WALCRK_2_CTG 1 thru 5	ALAMIT_2_PL1X3 ALAMIT_7_UNIT 3 - 5 ALAMIT_7_ES1 CENTER_6_PEAKEP	ELSEGN_2_UN1011 ELSEGN_2_UN1012 HINSON_6_LBECH1 thru 4	BuckBL_2_PL1X3 Any SDGE Unit
Path 61 Flows	-42	-38	-36	-32	-33	-32	-26	-28/-30

Notes:

- 1) The effectiveness factors shown in Table 3B are for a **100 MW increase** at the units listed in the table and a **100 MW decrease** on the PDCI schedules (**in the Southbound direction**). These effectiveness factors consider that when schedules are cut they will also affect LADWP flows.
- 2) Monitor the loading on South of Lugo because the mitigation for the Lugo – Victorville 500 kV line could increase the South of Lugo flow if High Desert, or PGAE is chosen to increment.
- 3) Pastoria and Ormond are not shown since with PDCI cuts they are less effective than all the listed generators and will potentially exacerbate Sylmar Bank Loading.

¹ Circulating South-to-North on PDCI without any targeted generation re-dispatch will have an Effectiveness Factor of approximately 25%.

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Effectiveness Factors - All		Distribution Restriction: None

Table 3C: Path 61 Generation Effectiveness Factors with LADWP Interchange Cuts

Unit →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.							
	High Desert	Etiwanda / Mira Loma Peaker / Grapeland Peaker	Mountain view	PGAE Gen	Huntington Beach / Barre Peaker / Walnut	Alamitos / Center Peaker / SDGE Gen	El Segundo / Long Beach	Buck Boulevard / SDGE Gen
Resource ID →	HIDSRT_2_ UNITS	ETMWND_6_ GRPLND MIRLOM_6_ PEAKER	SBERDO_2_ PSP3_	Any Unit	HNTGBH_2_PL1X3 HNTGBH_7_UNIT2 BARRE_6_ PEAKER WALCRK_2_C TG 1 thru 5	ALAMIT_2_PL1X3 ALAMIT_7_ UNIT 3 - 5 ALAMIT_7_ES1 CENTER_6_ PEAKER	ELSEGN_2_UN1011 ELSEGN_2_UN1012 HINSON_6_ LBECH1 thru 4	BuckBL_2_PL 1X3 SDGE Any Unit
Path 61 Flows	-46	-43	-41	-37	-38	-38	-35	-31 / -34

Notes:

- 1) The effectiveness factors shown in [Table 3C](#) are for a **100 MW increase** at the units listed in the table and a **100 MW decrease** in the Interchange with the LADWP area. In order to decrease the Interchange with the LADWP area, curtail Schedules at the interface titled "Lugo Checkout" per CAISO Operating Procedure [2540 Interchange Schedule Curtailments](#).
- 2) Monitor the loading on South of Lugo as the mitigation for the Lugo – Victorville 500 kV line Nomogram could increase the South of Lugo flow if High Desert, or PGAE is chosen to increment.
- 3) Big Creek, Pastoria, and Ormond Beach are not shown as they are less effective than all the listed generators and will exacerbate Sylmar Bank Loading.

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Effectiveness Factors - All		Distribution Restriction: None


Table 3D: Path 61 Effectiveness Factors with IPP + LADWP Schedule Cuts

Unit →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.					
	High Desert	Etiwanda / Grapeland Peaker / Mira Loma Peaker	Mountain view	Sentinel 1-8	Tehachapi Wind Gen	Big Creek / Pastoria
Resource ID →	HIDSRT_2_UNITS	MIRLOM_6_PEAKER ETWWD_6_GRPLND	SBERDO_2_PSP3_PSP4	SENTNL_2_CTG1-8	EMS Navigator -> System Wind Generation Summary For any of the 45 Resource IDS	BIGCRK_2_EXESWD LEBECS_2_UNITS
Path 61	-66	-62	-60	-57	-54	-43 / -38

Notes:

- 1) These Effectiveness Factors were by cutting IPP schedules in combination with a cut in Interchange between SCE and LADWP. Effectively Intermountain Power is decreased and CAISO controlled generation is increased.
- 2) Monitor the loading on South of Lugo because mitigation for the Lugo – Victorville 500 kV line Nomogram can increase the South of Lugo flow if High Desert, or PGAE Generation is increased.
- 3) Monitor the loading on the Sylmar transformer banks. Depending upon the flow on the Sylmar transformer banks, reducing generation at Ormond, Pastoria, or Big Creek may increase the Sylmar transformer bank loading.
- 4) The effectiveness factors are based on a normal steady-state condition, and may differ under real-time conditions.

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Effectiveness Factors - All		Distribution Restriction: None	

7110 - Effectiveness Factors for Humboldt Area: (version 13.3, 9/12/24)

Table 3A: Generation Effectiveness Factors: Contingency Operations Flow Limits

Control Points ↓ Resource ID →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.						
	Humboldt Bay Generating Station#1 & Humboldt Bay Generating Station#2		Humboldt Bay Generating Station #3		Blue Lake 60 kV	Pacific Lumber 60 kV (QF)	Fairhaven 60 kV (QF)
	HUMBPP_6_UNITS		HUMBPP_1_UNITS3		BLULKE_6_BLU ELK	PACLUM_6_U NIT	FAIRHV_6_U NIT
CP #8 0.8*Trinity-Cottonwood 115 kV (←@Cottonwood) + Keswick - Cascade 60 kV (←@Cascade)	60 kV	115 kV	60 kV	115 kV	-60	-54	-62
	-82	-58	-82	-58			
CP #9 Humboldt – Trinity 115 kV (←, @Humboldt) + Trinity – Maple Creek 60 kV (→, @Maple Creek) + Garberville-Laytonville 60 kV (← @Garberville)	60 kV	115 kV	60 kV	115 kV	-96	-92	-96
	-95	-96	-95	-96			
CP #10 0.8*Bridgeville - Cottonwood 115 kV (← @Cottonwood)+ Keswick - Cascade 60 kV (← @Cascade)	60 kV	115 kV	60 kV	115 kV	-60	-54	-62
	-82	-58	-82	-58			
CP #11 0.70*Bridgeville - Cottonwood 115 kV (← @Cottonwood)+ Trinity - Maple Creek 60 kV (← @Trinity)	60 kV	115 kV	60 kV	115 kV	-83	-60	-78
	-76	-82	-76	-82			
CP #12 Bridgeville - Cottonwood 115 kV (←, @Bridgeville) + Trinity - Maple Creek 60 kV (→, @Maple Creek) + Garberville - Laytonville 60 kV (← @Garberville)	60 kV	115 kV	60 kV	115 kV	-96	-92	-96
	-95	-96	-95	-96			

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Effectiveness Factors - All		Distribution Restriction: None

Control Points ↓ Resource ID →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.						
	Humboldt Bay Generating Station#1 & Humboldt Bay Generating Station#2		Humboldt Bay Generating Station#3		Blue Lake 60 kV	Pacific Lumber 60 kV (QF)	Fairhaven 60 kV (QF)
	HUMBPP_6_UNITS		HUMBPP_1_UNITS3		BLULKE_6_BLUELK	PACLUM_6_UNIT	FAIRHV_6_UNIT
CP #13 Humboldt – Trinity 115 kV (←, @Humboldt) + Bridgeville – Cottonwood 115 kV (←, @Bridgeville) + Trinity – Maple Creek 60 kV (←, @Maple Creek) + Garberville – Laytonville 60 kV (← @Garberville)	60 kV	115 kV	60 kV	115 kV			
	-95	-96	-95	-96	-96	-92	-96

Note: Humboldt Bay Generation Station Resources 1 & 2 normally dispatched from 60 kV bus. Humboldt Bay Generation Station Resource 3 normally dispatched from 115 kV bus.

Note: If Humboldt Bay Generating Station Units 1 or 2 are dispatched from the 115 kV bus by closing the bus tiebreaker, use an Exceptional Dispatch. Also, if Humboldt Bay Generating Station Unit 3 is dispatched from the 60 kV bus by closing bus tiebreaker, use an Exceptional Dispatch.

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Table 3B: Generation Effectiveness Factors: Normal Operations Flow Limits

Control Points ↓ Resource ID →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Humboldt Bay Generating Station Resource #1		Humboldt Bay Generating Station Resource #3		Blue Lake 60 kV	Fairhaven 60 kV (QF)
	HUMBPP_6_UNITS		HUMBPP_1_UNITS3		BLULKE_6_BLUELK	FAIRHV_6_UNIT
CP #1 (0.44*Trinity – Cottonwood 115 kV + Keswick – Cascade 60 kV)	60 kV	115 kV	60 kV	115 kV	-27	-27
	-24	-25	-24	-25		
CP #2 Humboldt – Trinity 115 kV (← @Humboldt) + Bridgeville – Cottonwood 115 kV (← @Bridgeville) + Trinity – Maple Creek 60 kV (→ @Maple Creek) + Garberville – Laytonville 60 kV (← @Garberville)	60 kV	115 kV	60 kV	115 kV	-96	-96
	-95	-96	-95	-96		
CP #3 (0.93*Humboldt 115/60 kV bank #1 + Humboldt 115/60 kV bank #2)	60 kV	115 kV	60 kV	115 kV	-81	-82
	-75	14	-75	14		
CP #4 (0.38* Humboldt Bay – Humboldt #2 60 kV + Humboldt Bay – Humboldt #1 60 kV)	60 kV	115 kV	60 kV	115 kV	N/A	N/A
	45	N/A	45	N/A		
CP #5 (0.40 * Humboldt Bay – Humboldt #2 60 kV + Humboldt Bay – Humboldt #1 60 kV)	60 kV	115 kV	60 kV	115 kV	N/A	N/A
	45	N/A	35	N/A		
CP #6 0.76*Bridgeville 115/60 kV Bank (→, @Bridgeville 115 kV) + Humboldt Bay – Rio Dell 60 kV (→, @Humboldt Bay)	60 kV	115 kV	60 kV	115 kV	N/A	N/A
	8	8	8	8		

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Resource ID → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Humboldt Bay Generating Station Resource #1		Humboldt Bay Generating Station Resource #3		Blue Lake 60 kV	Fairhaven 60 kV (QF)
	HUMBPP_6_UNITS		HUMBPP_1_UNITS3		BLULKE_6_BLUELK	FAIRHV_6_UNIT
CP #7 0.53* Humboldt – Bridgeville 115 kV (→, @Humboldt 115 kV) + Humboldt Bay – Rio Dell 60 kV (→, @Humboldt Bay)	60 kV	115 kV	60 kV	115 kV	30	11
	30	30	30	30		

This table indicates the degree of effectiveness that Generation will be at relieving the calculated loading across the multiple transmission facilities that make up the control point.

Note: Humboldt Bay Generation Station Resources 1 & 2 normally dispatched from 60 kV bus. Humboldt Bay Generation Station Resource 3 normally dispatched from 115 kV bus.

Note: If Humboldt Bay Generating Station Resources 1 & 2 are dispatched from the 115 kV bus by closing the bus tiebreaker, use an Exceptional Dispatch. Also, if Humboldt Bay Generating Station Resource 3 is dispatched from the 60 kV bus by closing bus tiebreaker, use an Exceptional Dispatch.

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Effectiveness Factors - All		Distribution Restriction: None


Table 3C: Generation Effectiveness Factors: Transmission Facilities

Resource ID → Facility↓	MW increase in the calculated loading across a transmission facility for a 100 MW increase in Generation.								
	Humboldt Bay Generating Station#1		Humboldt Bay Generating Station#2		Humboldt Bay Generating Station#3		Blue Lake 60 kV	Pacific Lumber 60 kV (QF)	Fairhaven 60 kV (QF)
	HUMBPP_6_ UNITS1		HUMBPP_6_ UNITS2		HUMBPP_1_ UNITS3		BLULKE_6_ BLUELK	PACLUM_6_ UNIT	FAIRHV_6_ UNIT
Humboldt 115/60 kV bank #1 or 2 (→ @115 kV)	60 kV	115 kV	60 kV	115 kV	60 kV	115 kV	-42	-22	-41
	-37	7	-37	7	-37	7			
Humboldt - Trinity 115 kV Line (← @Humboldt)	60 kV	115 kV	60 kV	115 kV	60 kV	115 kV	-40	-29	-38
	-35	-38	-34	-38	-34	-38			
Bridgeville – Cottonwood 115 kV Line (← @Cottonwood)	60 kV	115 kV	60 kV	115 kV	60 kV	115 kV	-46	-47	-47
	-44	-47	-45	-47	-45	-47			
Humboldt – Maple Creek 60 kV Line (← @Humboldt)	60 kV	115 kV	60 kV	115 kV	60 kV	115 kV	-9	-7	-7
	-8	-7	-9	-7	-9	-7			
Bridgeville – Garberville 60 kV Line (← @Bridgeville)	60 kV	115 kV	60 kV	115 kV	60 kV	115 kV	-8	-8	-8
	-7	-7	-7	-7	-7	-7			
Humboldt Bay - Humboldt #1 60 kV Line (→ @Humboldt Bay)	60 kV	115 kV	60 kV	115 kV	60 kV	115 kV	N/A	N/A	N/A
	45	N/A	45	N/A	45	N/A			
Humboldt Bay – Eureka 60 kV Line (→ @Humboldt Bay)	60 kV	115 kV	60 kV	115 kV	60 kV	115 kV	N/A	N/A	N/A
	35	N/A	35	N/A	35	N/A			

This table indicates the degree of effectiveness that Generation will be at relieving flows on individual transmission facilities.

Note: Humboldt Bay Generation Station Resources 1 & 2 normally dispatched from 60 kV bus. Humboldt Bay Generation Station Resource 3 normally dispatched from 115 kV bus.

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Note: If Humboldt Bay Generating Station Resource 1 or 2 are dispatched from the 115 kV bus by closing bus tiebreaker, use an Exceptional Dispatch. Also, if Humboldt Bay Generating Station Resource 3 is dispatched from the 60 kV bus by closing bus tiebreaker, use an Exceptional Dispatch.

7120 - Effectiveness Factors for North Geysers Area: (version 9.7, 9/05/24)

Table 3: Generation Effectiveness Factors (North Geysers Area Generation)

Resource ID Control Points↓	MW increase in the Calculated Loading across the transmission facilities that make up the Loading limit for a 100 MW increase in Generation.								
	Aidlin	Geysers #5	Geysers #6	Geysers #7	Geysers #8	Geysers #11	Wadham	Indian Valley	Potter Valley
	ADLIN_1_UNITS	GYS5X6_7_UNITS	GYS5X6_7_UNITS	GYS7X8_7_UNITS	GYS7X8_7_UNITS	GEYS11_7_UNITS11	WADHAM_6_UNITS	INDVLY_1_UNITS	POTTER_6_UNITS
CP #1 0.14 * Eagle Rock – Fulton-Silverado 115 kV Line (→, @Eagle Rock) + Fulton - Hopland 60 kV line (←, @Hopland)	13	11	11	11	11	11	0	0	20
CP #2 0.66* Cortina 230/115 kV Bank #4 (→, @230 kV) + Cortina 230/115/60 kV Bank #1 (→, @230 kV)	-32	-32	-32	-32	-32	-32	-70	-51	-35

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Effectiveness Factors - All		Distribution Restriction: None

7230 - Effectiveness Factors for Palermo-Rio Oso Area: (version 15.5, 11/07/24)

Note: For the most effective solution, increasing and decreasing should be done in pairs. Two separate solutions need to be considered, one increase solution, and one decrease solution. If this is done, then their effectiveness factors can be added together resulting in a more accurate number. It is recommended to try and match the best increase option with the best decrease option for maximum effectiveness. (Symbol “-“ means increase generation to reduce congestion, symbol “+” means reduce generation to reduce congestion)

Table 3: Generation Effectiveness Factors – Palermo-Rio Oso Area

Control Points ↓	MW increase in the CALCULATED LOADING across the transmission facilities that make up the area LIMIT for 100 MW increase in Generation.											
	FREC	YCEC	South Feather Water and Power	Greenleaf II YC Cogen	Narrows 1 & 2	Colgate 1 & 2	Hyatt 1-6 Thermalito 1-4	Ralston Middle Fork 1-2	Drum 1-5 Dutch Flat 1 Dutch Flat 2 Chico Park	Bucks Creek Belden Rock Creek Cresta, Poe	Caribou Butt Valley and Grizzly	SPP import (E->W)
Resource ID ↓	BOGUE_1_UNITA1	YUBACT_6_UNITA1	SLYCRK_1_UNIT1 WDLEAF_7_UNIT1 FORBST_7_UNIT1	GRNLF2_1_UNIT YUBACT_1_SUNSWT	NAROW1_2_UNIT NAROW2_2_UNIT	COLGAT_7_UNIT1 COLGAT_7_UNIT2	HYTTM_2_UNITS	MDFKRL_2_PROJECT	DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT5 DUTCH1_7_UNIT1 DUTCH2_7_UNIT1 CHICPK_7_UNIT1	BUCKCK_7_PL1X2 BELDEN_7_UNIT1 RCKCRK_7_UNIT1 CRESTA_7_PL1X2 POEPH_7_UNIT1 & 2	CARBOU_7_PL2X3 CARBOU_7_PL4X5 CARBOU_7_UNIT1 BUTTVL_7_UNIT1 GRIZLY_1_UNIT1	NOTE: The (-) symbol means increasing imports E->W
CP #1 0.81* Palermo - Pease 115 kV line (→, @ Palermo) + Pease-Rio Oso 115 kV line (←, @ Rio Oso)	N/A	-70	N/A	-70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CP #2 0.25* Palermo - Nicolaus 115 kV line (→, @Palermo) + Palermo - Pease 115 kV line (→, @Palermo)	N/A	-40	10	-40	N/A	N/A	N/A	N/A	-5	N/A	3	-4

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Effectiveness Factors - All

Distribution Restriction: None

Control Points ↓	Resource ID ↓	MW increase in the CALCULATED LOADING across the transmission facilities that make up the area LIMIT for 100 MW increase in Generation.											
		FREC	YCEC	South Feather Water and Power	Greenleaf II YC Cogen	Narrows 1 & 2	Colgate 1 & 2	Hyatt 1-6 Thermalito 1-4	Ralston Middle Fork 1-2	Drum 1-5 Dutch Flat 1 Dutch Flat 2 Chico Park	Bucks Creek Belden Rock Creek Cresta, Poe	Caribou Butt Valley and Grizzly	SPP import (E->W)
		BOGUE_1_UNITA1	YUBACT_6_UNITA1	SLYCRK_1_UNIT1 WDLEAF_7_UNIT1 FORBST_7_UNIT1	GRNLF2_1_UNIT YUBACT_1_SUNSWT	NAROW1_2_UNIT NAROW2_2_UNIT	COLGAT_7_UNIT1 COLGAT_7_UNIT2	HYTTHM_2_UNITS	MDFKRL_2_PROJECT	DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT5 DUTCH1_7_UNIT1 DUTCH2_7_UNIT1 CHICPK_7_UNIT1	BUCKCK_7_PL1X2 BELDEN_7_UNIT1 RCKCRK_7_UNIT 1&2 CRESTA_7_PL1X2 POEPH_7_UNIT1 & 2	CARBOU_7_PL2X3 CARBOU_7_PL4X5 CARBOU_7_UNIT1 BUTTVL_7_UNIT1 GRIZLY_1_UNIT1	NOTE: The (-) symbol means increasing imports E->W
CP #3 0.25* Palermo - Nicolaus 115 kV line (→, @Palermo) + Pease - Rio Oso 115 kV line (→, @Pease)		-3	40	8	40	N/A	N/A	N/A	N/A	-7	-3	-3	-5
CP #4 0.16*Palermo - Bogue 115 kV line (→, Palermo) + Palermo - Pease 115 kV line (→, @Palermo)		N/A	-40	10	-40	N/A	N/A	N/A	N/A	-5	N/A	3	-4
CP #5 0.42*Colgate #3 230/60 kV Bank (→, @60 kV) + Colgate - Palermo 60 kV (←, @Palermo) - 0.40*Colgate SPS armed Load		N/A	-8	N/A	-8	-38 <i>Note 1</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CP #6 0.36*Rio Oso 230/115 kV Bank 2 (→, @115 kV) + Rio Oso 230/115kV Bank 1 (→, @115 kV)		-30	-20	-11	-20	N/A	N/A	N/A	3	-25	7	-5	-21



Effectiveness Factors - All

**Distribution Restriction:
None**

Control Points ↓	MW increase in the CALCULATED LOADING across the transmission facilities that make up the area LIMIT for 100 MW increase in Generation.											
	FREC	YCEC	South Feather Water and Power	Greenleaf II YC Cogen	Narrows 1 & 2	Colgate 1 & 2	Hyatt 1-6 Thermalito 1-4	Ralston Middle Fork 1-2	Drum 1-5 Dutch Flat 1 Dutch Flat 2 Chico Park	Bucks Creek Belden Rock Creek Cresta, Poe	Caribou Butt Valley and Grizzly	SPP import (E->W)
Resource ID ↓	BOGUE_1_UNITA1	YUBACT_6_UNITA1	SLYCRK_1_UNIT1 WDLEAF_7_UNIT1 FORBST_7_UNIT1	GRNLF2_1_UNIT YUBACT_1_SUNSWT	NAROW1_2_UNIT NAROW2_2_UNIT	COLGAT_7_UNIT1 COLGAT_7_UNIT2	HYTTHM_2_UNITS	MDFKRL_2_PROJECT	DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT5 DUTCH1_7_UNIT1 DUTCH2_7_UNIT1 CHICPK_7_UNIT1	BUCKCK_7_PL1X2 BELDEN_7_UNIT1 RCKCRK_7_UNIT1 CRESTA_7_PL1X2 POEPH_7_UNIT1 & 2	CARBOU_7_PL2X3 CARBOU_7_PL4X5 CARBOU_7_UNIT1 BUTTVL_7_UNIT1 GRIZLY_1_UNIT1	NOTE: The (-) symbol means increasing imports E->W
CP #7 0.04*Table Mt-Rio Oso 230 kV line (→, @Table Mt) + Palermo - Pease 115 kV line (→, @Palermo)	N/A	-40	9	-40	N/A	N/A	N/A	N/A	-4	N/A	3	-4
CP #8 0.058*Table Mt - Rio Oso 230 kV line (→, @Table Mt) + Pease - Rio Oso 115 kV line (→, @Pease)	-3	40	7	40	N/A	N/A	N/A	N/A	-7	-3	-3	-5
CP #9 0.01*Table Mt-Vaca Dixon 500 kV line (→, @Table Mt) + Palermo-Pease 115 kV line (→, @Palermo)	N/A	-40	9	-40	N/A	N/A	N/A	N/A	-4	N/A	3	N/A
CP #10 0.013*Table Mt - Vaca Dixon 500 kV line (→, @Table Mt) + Pease - Rio Oso 115 kV line (→, @Pease)	-3	40	7	40	N/A	N/A	N/A	N/A	-5	-3	-3	-5

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None**


Control Points ↓	Resource ID ↓	MW increase in the CALCULATED LOADING across the transmission facilities that make up the area LIMIT for 100 MW increase in Generation.											
		FREC	YCEC	South Feather Water and Power	Greenleaf II YC Cogen	Narrows 1 & 2	Colgate 1 & 2	Hyatt 1-6 Thermalito 1-4	Ralston Middle Fork 1-2	Drum 1-5 Dutch Flat 1 Dutch Flat 2 Chico Park	Bucks Creek Belden Rock Creek Cresta, Poe	Caribou Butt Valley and Grizzly	SPP import (E->W)
		BOGUE_1_UNITA1	YUBACT_6_UNITA1	SLYCRK_1_UNIT1 WDLEAF_7_UNIT1 FORBST_7_UNIT1	GRNLF2_1_UNIT YUBACT_1_SUNSWT	NAROW1_2_UNIT NAROW2_2_UNIT	COLGAT_7_UNIT1 COLGAT_7_UNIT2	HYTTHM_2_UNITS	MDFKRL_2_PROJECT	DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT5 DUTCH1_7_UNIT1 DUTCH2_7_UNIT1 CHICPK_7_UNIT1	BUCKCK_7_PL1X2 BELDEN_7_UNIT1 RCKCRK_7_UNIT 1&2 CRESTA_7_PL1X2 POEPH_7_UNIT1&2	CARBOU_7_PL2X3 CARBOU_7_PL4X5 CARBOU_7_UNIT1 BUTTVL_7_UNIT1 GRIZLY_1_UNIT1	NOTE: The (-) symbol means increasing imports E->W
CP #11 0.012*Table Mt - Vaca Dixon 500 kV line (→, @Table Mt) + Palermo - Bogue 115 kV line (→, @Bogue)		-40	N/A	7	N/A	N/A	N/A	N/A	N/A	-4	N/A	3	-5
CP #12 0.37*Pease 115/60 kV Bank 2 (→, @115 kV) + Smartville - Marysville 60 kV line (→, @Smartville)		N/A	-30	N/A	-30	15 <i>Note 1</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CP #13 Pease 115/60 kV Bank 2 (→, @115kV) + Table Mt - Peachton 60 kV line (→, @Table Mt)		N/A	-100	N/A	-100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CP #14 Pease 115/60 kV Bank 2 (←, @60 kV) + Peachton - Pease 60 kV line (←, @Pease)		N/A	100	N/A	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



Effectiveness Factors - All

**Distribution Restriction:
None**


Control Points ↓	Resource ID ↓	MW increase in the CALCULATED LOADING across the transmission facilities that make up the area LIMIT for 100 MW increase in Generation.											
		FREC	YCEC	South Feather Water and Power	Greenleaf II YC Cogen	Narrows 1 & 2	Colgate 1 & 2	Hyatt 1-6 Thermalito 1-4	Ralston Middle Fork 1-2	Drum 1-5 Dutch Flat 1 Dutch Flat 2 Chico Park	Bucks Creek Belden Rock Creek Cresta, Poe	Caribou Butt Valley and Grizzly	SPP import (E->W)
		BOGUE_1_UNITA1	YUBACT_6_UNITA1	SLYCRK_1_UNIT1 WDLEAF_7_UNIT1 FORBST_7_UNIT1	GRNLF2_1_UNIT YUBACT_1_SUNSWT	NAROW1_2_UNIT NAROW2_2_UNIT	COLGAT_7_UNIT1 COLGAT_7_UNIT2	HYTTM_2_UNITS	MDFKRL_2_PROJECT	DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT5 DUTCH1_7_UNIT1 DUTCH2_7_UNIT1 CHICPK_7_UNIT1	BUCKCK_7_PL1X2 BELDEN_7_UNIT1 RCKCRK_7_UNIT1 CRESTA_7_PL1X2 POEPH_7_UNIT1 & 2	CARBOU_7_PL2X3 CARBOU_7_PL4X5 CARBOU_7_UNIT1 BUTTVL_7_UNIT1 GRIZLY_1_UNIT1	NOTE: The (-) symbol means increasing imports E->W
CP #15 0.55*Table Mt - Peachton 60 kV line (→, @Table Mt) + Palermo - Pease 115 kV line (→, @Palermo)		N/A	-50	8	-50	N/A	N/A	N/A	N/A	-5	N/A	3	-4
CP #16 0.25*Palermo 230/115 kV Bank 2 (→, @230 kV)+ Rio Oso 230/115 kV Bank 1 (→, @230 kV)		-30	-23	-26	-23	N/A	N/A	N/A	N/A	-19	3	-7	-18
CP #17 0.28*Palermo 230/115 kV Bank 2 (→, @230 kV) + Rio Oso 230/115 kV Bank 2 (→, @230 kV)		-32	-25	-29	-25	N/A	N/A	N/A	N/A	-21	3	-8	-19
CP #18 0.09*Palermo 230/115 kV Bank 2 (→, @230 kV) + Table Mtn - Peachton 60 kV line (→, @Table Mt)		N/A	-25	-8	-25	N/A	N/A	N/A	N/A	-3	N/A	N/A	N/A

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Control Points ↓	Resource ID ↓	MW increase in the CALCULATED LOADING across the transmission facilities that make up the area LIMIT for 100 MW increase in Generation.											
		FREC	YCEC	South Feather Water and Power	Greenleaf II YC Cogen	Narrows 1 & 2	Colgate 1 & 2	Hyatt 1-6 Thermalito 1-4	Ralston Middle Fork 1-2	Drum 1-5 Dutch Flat 1 Dutch Flat 2 Chico Park	Bucks Creek Belden Rock Creek Cresta, Poe	Caribou Butt Valley and Grizzly	SPP import (E->W)
		BOGUE_1_UNITA1	YUBACT_6_UNITA1	SLYCRK_1_UNIT1 WDLEAF_7_UNIT1 FORBST_7_UNIT1	GRNLF2_1_UNIT YUBACT_1_SUNSWT	NAROW1_2_UNIT NAROW2_2_UNIT	COLGAT_7_UNIT1 COLGAT_7_UNIT2	HYTTHM_2_UNITS	MDFKRL_2_PROJECT	DRUM_7_PL1X2 DRUM_7_PL3X4 DRUM_7_UNIT5 DUTCH1_7_UNIT1 DUTCH2_7_UNIT1 CHICPK_7_UNIT1	BUCKCK_7_PL1X2 BELDEN_7_UNIT1 RCKCRK_7_UNIT 1&2 CRESTA_7_PL1X2 POEPH_7_UNIT1&2	CARBOU_7_PL2X3 CARBOU_7_PL4X5 CARBOU_7_UNIT1 BUTTVL_7_UNIT1 GRIZLY_1_UNIT1	NOTE: The (-) symbol means increasing imports E->W
CP #19 0.05*Table Mt 500/230 kV Bank 1 (→, @500 kV) + Rio Oso 230/115 kV Bank 1 (→, @230 kV)		-22	-16	-10	-16	N/A	N/A	-4	N/A	-17	3	-6	-16
CP #20 0.05*Table Mt 500/230 kV Bank 1 (→, @500 kV) + Rio Oso 230/115 kV Bank 2 (→, @230 kV)		-24	-17	-11	-17	N/A	N/A	-5	N/A	-19	4	-7	-18

Note¹: Applicable only when the Colgate 60 kV system is not radialized. Also, Narrows units are currently not dispatchable.

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7240 - Effectiveness Factors for Drum Area / Summit Operations: (version 14.2, 11/01/24)

Table 5: Normal Operations - Effectiveness Factors, Simultaneous Loading Limits

Resource ID → Control Points ↓	MW increase in the Calculated Loading across the transmission facilities that make up the Loading limit for a 100 MW increase in Generation.								
	Drum 1-4	Drum 5	Dutch Flat 1	Dutch Flat 2	Chicago Park	Wise	Rollins	Newcastle	Summit Tie Exports
	DRUM_7_PL1X2 DRUM_7_PL3X4	DRUM_7_UNIT 5	DUTCH1_7_UNIT 1	DUTCH2_7_UNIT 1	CHICPK_7_UNIT 1	WISE_1_UNIT 1	ROLLIN_6_UNIT	NWCSTL_7_UNIT 1	SUMITM_1_SPP
CP #1	30	44	31	48	42	N/A	33	N/A	-43
CP #2	46	44	31	40	42	N/A	33	N/A	-43

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7320 - Effectiveness Factors for Bay Area Transmission Management: (version 24.7, 5/07/24)

Table 3A: Generation Effectiveness Factors – System Operating Limits

Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.														
	TBC	Ptsb. 115 kV	Ptsb. 230 kV	Oakland	Contra Costa	Los Esteros	Lambie	River -view	Gilroy	MEC	Moss 230 kV	Geysers	Cal- peak	Kelso (Mariposa)	Russell City
Control Points↓	See Table 3C														
CP #1: 0.24* Pittsburg - San Mateo 230 kV (→, @Pittsburg) + Pittsburg-Eastshore 230 kV (→, @Pittsburg)	-20	+11	+12	+7	+2	-3	+2	-	-2	-2	-	+6	+2	-	-22
CP #2: 0.30* Kelso - Tesla 230 kV (←, @Tesla) + Delta Sw Yd - Tesla 230 kV (←, @Tesla)	+2	-6	-6	-10	-34	-4	-14	-22	-2	-2	-	-7	-7	-25	-4
CP #3: 0.228* Tesla 500/230 kV Bank #6 (→, @LSIDE) + Tesla 500/230 kV Bank #4 (→, @HSIDE)	+2	-12	-12	-11	-13	-8	-7	-12	-3	-2	-	-6	-2	-	-9
CP #4: 0.164* Tesla 500/230 kV Bank #4 (→, @HSIDE) + Tesla 500/230 kV Bank #6 (→, @LSIDE)	+8	-22	-24	-17	-12	-13	-7	-11	-6	-5	-2	-11	-4	-	-16
CP #5: 0.71* Pittsburg 230/115 kV Bank #12 (→, @LSIDE) + Pittsburg 230/115 kV Bank #13 (→, @LSIDE)	-4	-57	+4	-9	-2	-	-	-	-	-	-	-2	-	-	-
CP #6: Metcalf - Morgan Hill 115 kV (→, @Metcalf) + Metcalf - Llagas 115 kV (→, @Metcalf)	-	-	-	-	-	-	-	-	-100	-	-	-	-	-	-

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Table 3A: Generation Effectiveness Factors – System Operating Limits *Continued...*

Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.													
	TBC	Ptsb. 115 kV	Ptsb. 230 kV	Oakland	Contra Costa	Los Esteros	Lambie	River-view	Gilroy	Geysers	Cal-peak	Birds Landing Wind	Kelso (Mariposa)	Russell City
Control Points ↓	See Table 3C													
CP # 7: 0.30* Sobrante - Claremont #1 115 kV (→, @Claremont) + Sobrante-Grizzly - Claremont #2 115 kV (→, @Claremont)	-2	+2	+2	-25	-2	-	-	-	-	+3	-	-	-	-
CP # 8: 0.38* Moraga 230/115 kV Bank #2 (→, @HSIDE) + Moraga 230/115 kV Bank #3 (→, @HSIDE)	+6	-9	-6	-26	+4	-	-	-	-	-4	-	-	-	-
CP # 9: Normal Loading Llagas - Gilroy 115 kV (←, @Llagas)	-	-	-	-	-	-	-	-	+100	-	-	-	-	-
CP # 11: 0.65 * Birds Landing Sw Sta -Contra Costa PP 230 kV (→, @ Birds Landing) + Contra Costa PP - Contra Costa sub 230 kV (←, Contra Costa Sub)	-	-3	-3	-5	-21	-3	+33	+70	-	-	-	+45	-7	-3

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Table 3A: Generation Effectiveness Factors – System Operating Limits *Continued...*

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.																			
	TBC	Ptsb. 115 kV	Ptsb. 230 kV	Oakland	Contra Costa	Los Esteros	Lambie	River-view	North Geysers	South Geysers	Birds Landing Wind	Kelso (Mariposa)	Russell City	Tosco (Rodeo Plant)	Chevron Richmond Refinery	Berkeley Cogeneration	Shell Oil Refinery Aggregate	Crocket Cogen	Martinez Cogen Limited	Colusa Generating Station
Resource IDs → Control Points ↓	See Table 3C																			
CP # 13 0.15 * Contra Costa -> Los Positas 230 kV (@ Contra Costa PP) + Lonetree -> Cayetano 230 kV (@ Cayetano)	-3	-	-	+2	+1 0	-4	+5	+9	-	-	+7	+3	-3	-	-	-	-	-	-	-
CP # 15 0.43 * Eastshore -> San Mateo 230 kV line (@Eastshore) + Dumbarton -> Newark 115 kV line (@Dumbarton)	-6	5	5	3	-	-	-	-	-	-	-	-	-42	-	-	-	-	-	-	-
CP # 16 0.27 *Pittsburg -> San Mateo 230 kV line (@Pittsburg) + Eastshore -> San Mateo 230 kV line (@ Eastshore)	-21	7	8	5	-	-	-	-	-	-	-	-	-56	-	-	-	-	-	-	-
CP # 23: Christie - Sobrante 115 kV line (←, @Sobrante) + Oleum - North Tower - Christie 115 kV line (→, Oleum)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CP # 25: 0.21* Sobrante - Moraga 115 kV line (←, @Moraga) + Moraga - Claremont #2 115 kV line (→, @Moraga)	2	-2	-2	-7	-	-	-	-	-3	-3	-	-	-	-9	-11	-11	-6	-5	-4	-

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	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.																			
	TBC	Ptsb. 115 kV	Ptsb. 230 kV	Oakland	Contra Costa	Los Esteros	Lambie	River-view	North Geysers	South Geysers	Birds Landing Wind	Kelso (Mariposa)	Russell City	Tosco (Rodeo Plant)	Chevron Richmond Refinery	Berkeley Cogeneration	Shell Oil Refinery Aggregate	Crocket Cogen	Martinez Cogen Limited	Colusa Generating Station
Resource IDs → Control Points ↓	See Table 3C																			
CP # 26: 0.21* Vaca - Lakeville #1 230 kV line (→, @Vaca) + Tulucay - Vaca 230 kV line (←, @Vaca)	-5	-6	-6	-	-	-	-	-	-15	-35	-	-	-5	-	-	-	-	-17	-9	3

Note: For CP #27 see listing for 7340, Table 3. This CP requires Silicon Valley Power mitigation for alleviating the overloads.

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Table 3B: Generation Effectiveness Factors - Individual Elements

Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.														
	TBC	Ptsb. 115 kV	Ptsb. 230 kV	Oakland	Contra Costa	Los Esteros	Lambie	River-view	Gilroy	MEC	Moss 230 kV	Moss 500 kV	Geysers	Cal-peak	Russell City
ControlPoints ↓	See Table 3C														
Metcalf 500/230 KV Bank #11	-5	-4	-4	-4	-3	-11	-2	-3	-17	-19	-4	-	-2	-	-7
Metcalf 500/230 KV Bank #12	-6	-4	-4	-4	-3	-11	-2	-3	-19	-20	-5	2	-3	-	-8
Metcalf 500/230 KV Bank #13	-5	-4	-5	-4	-3	-12	-2	-3	-19	-21	-5	2	-3	-	-8
Moss Landing 500/230 KV Bank #9	2	3	3	3	3	5	2	2	7	8	57	-12	2	2	-
Tesla 500/230 KV Bank #2	-4	-5	-5	-5	-5	-7	-2	-5	-2	-	-	-	-2	-	-9
Tesla 500/230 KV Bank #4	-	-7	-7	-7	-11	-5	-5	-10	-2	-	-	-	-4	-	-6
Tesla 500/230 KV Bank #6	8	-21	-22	-16	-10	-12	-6	-9	-6	-4	-2	-	-11	-3	-15
Tracy 500/230 KV Banks KT1A OR KT2A	-	-4	-4	-4	-6	-4	-3	-5	-2	-	-	-	-3	-2	-4
Vaca Dixon 500/230 KV Bank #11 OR #12	4	-11	-10	-15	-15	-5	-24	-16	-2	-2	-	-	-23	-32	-7

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Table 3B: Generation Effectiveness Factors - Individual Elements *Continued...*

Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.														
	TBC	Ptsb. 115 kV	Ptsb. 230 kV	Oakland	Contra Costa	Los Esteros	Lambie	River-view	Gilroy	MEC	Moss 230 kV	Moss 500 kV	Geysers	Cal-peak	Russell City
	See Table 3C														
Ignacio (Crock Tap) – Sobrante 230 KV Line	4	-6	-6	-5	-	-	-	-	-	-	-	-	19	3	-3
Lakeville-Sobrante #2 230 KV Line	5	-7	-7	-6	-	-2	2	-	-	-	-	-	23	3	-3
Moss Landing-Metcalf #1 OR #2 230 KV	-2	-3	-3	-3	-3	-5	-3	-3	-7	-7	13	2	-3	-2	-4
New ark – Ravensw ood 230 KV Line	-29	-3	-4	-	4	8	2	3	-	-	-	-	-	-	-25
Pittsburg – Eastshore 230 KV Line	-	9	10	6	-	-2	-	-	-2	-	-	-	5	-	-21
Pittsburg – San Mateo 230 KV Line	-	8	9	5	-	-2	-	-	-	-	-	-	4	-	-5
Ravensw ood – San Mateo #1 OR #2 230 KV	-17	-5	-5	-3	-	-	-	-	-	-	-	-	-2	-	-21
Tesla – New ark #1 230 KV line	-4	-7	-7	-7	-5	-14	-3	-5	-7	-6	-3	-2	-4	-2	-11
Tesla – New ark #2 230 kV line	-9	-	-	-2	-3	-13	-2	-3	-6	-5	-2	-2	-	-	-9
Pittsburg – Tesla #1or #2 230kV (←)/(→)	12 -12	-16 16	-17 17	-10 10	-3 3	-2 2	-3 3	-	-	-	-	-	-8 8	-2 2	-5
Tesla – Ravenswood 230 KV Line	-11	-6	-6	-5	-3	-9	-2	-3	-5	-4	-2	-2	-3	-	-15
Tesla – Tracy #1 OR #2 230 KV Lines (←)	-	-6	-6	-6	-8	-5	-5	-7	-3	-2	-	-	-4	-3	-6

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Table 3B: Generation Effectiveness Factors - Individual Elements *Continued...*

Control Points ↓ Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.														
	TBC	Ptsb. 115 kV	Ptsb. 230 kV	Oakland	Contra Costa	Los Esteros	Lambie	River-view	Gilroy	MEC	Moss 230 kV	Moss 500 kV	Geysers	Cal-peak	Russell City
	See Table 3C														
Vaca Dixon – Bahia 230 KV Line	-	-4	-3	-7	-3	-2	-	-2	-	-	-	-	4	4	-
Vaca Dixon – Peabody 230 kV Line	-	-2	-2	-3	-11	-2	-2	-10	-	-	-	-	3	6	-
Monta Vista – Jefferson 230 kV Line #1 OR #2	-9	-2	-2	-2	-	-	-	-	2	2	-	-	-	-	-5
Vaca Dixon – Lambie Sw Sta 230 kV Line	-	-2	-2	-3	-16	-2	-58	-19	-	-	-	-	3	7	-
Vaca Dixon – Parkway 230 KV Line	-2	-4	-4	-8	-3	-2	-	-3	-	-	-	-	4	4	-
Moraga – Coco PP # 1 230 kV	+4	-6	-5	-12	+11	-2	+5	+10	-	-1	-	-	-	-	-
Moraga - Coco PP # 2 230 kV	+4	-6	-5	-12	+11	-2	+4	+10	-	-1	-	-	-	-	-
Coco PP- Los Positas 230 kV	-3	-	-	+2	+10	-5	+6	+10	-2	-2	-	-	-	-	-3
Lonetree - Cayetano 230 kV	-3	-	-	+2	+8	-4	+5	+7	-2	-1	-	-	-	-	-3

Notes:

- Wolfskill Energy Center has approximately the same effectiveness factor as Calpeak.
- 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 [Table 3A](#).
 1. Example 1, MW flow is assumed from Newark to Ravenswood on the “Newark -Ravenswood 230 kV Line” (therefore, no symbol is required).
 2. Example 2, MW flow is assumed from Tracy to Tesla on the “Tesla-Tracy #1 & #2 230 kV Lines (←)”. The typical direction of power flow is also illustrated in attachment D – Sketches, Bay Area Transmission System.

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- *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 230 kV Cable and two reactors in-service on the San Mateo-Martin 230 kV 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 [Table 3A](#) does not consider economic factors. Therefore, the “most effective” mitigation measure may not necessarily be the “most efficient/economic” solution to relieve facility loading.*
- *Refer to [Table 3C](#) for a list of individual units within each of the Generation groups.*
- *Refer to Operating Procedure [7120 North Geysers Area - 115 kV](#) for Geysers Generation Dispatch instructions.*

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Table 3C: Resource IDs


Generation Group	Resource Name	Resource ID
Pittsburg Group- 115 KV	Medanos Energy Center 1X0 Mode, 1X1 Mode, Los 2X1 Mode	LMEC_1_CC1X0, LMEC_1_CC1X1, LMEC_1_CC2X1
	Los Medanos Energy Center AGGREGATE	LMEC_1_PL1X3
Pittsburg Group- 230 KV	Delta Energy Center Aggregate	DELTA_2_PL1X4
	Delta Energy Center CCYC Modes 1X0, 1X1, 2X1, 3X1	DELTA_2_CC1X0, DELTA_2_CC1X1, DELTA_2_CC2X1, DELTA_2_CC3X1
Oakland Group	Oakland Station C GT Units 1, 2, 3	OAK C_7_UNIT 1, OAK C_7_UNIT 2, OAK C_7_UNIT 3
	Alameda GT Units 1, 2	ALMEGT_1_UNIT 1, ALMEGT_1_UNIT 2
Contra Costa Group	Gateway Generation Station	GATWAY_2_PL1X3
	Marsh Landing Generation Unit 1 2 3 4	COCOPP_2_CTG3, COCOPP_2_CTG4, COCOPP_2_CTG1, COCOPP_2_CTG2
	Montezuma Wind (Estimated Sync Date Dec 2011)	BRDSLD_2_MTZUMA
Birds Landing Wind Gen	High Winds Energy Center	BRDSLD_2_HIWIND
	Shiloh 1 Wind Project	BRDSLD_2_SHILO1
	Shiloh 2 Wind Project	BRDSLD_2_SHILO2
	Shiloh 3A Wind Project	BRDSLD_2_SHILO3A
	Solano Wind Firm	USWNRD_2_SMUD
	Solano Wind Firm Project Phase 3	USWNRD_2_SMUD2
	Los Esteros Energy Facility Aggregate	LECEF_1_UNITS
Los Esteros Group (Silicon Valley Area Group)	Gilroy Cogen 1X0 Mode, 1X1 Mode	GILROY_1_CC1X0, GILROY_1_CC1X1
Gilroy Group (Silicon Valley Area Group)	Gilroy Cogen Aggregate	GILROY_1_UNIT
	Gilroy Energy Center Units 1, 2	GILRPP_1_UNIT 1, GILRPP_1_UNIT 2
	Gilroy Energy Center Units 1 & 2 Aggregate	GILRPP_1_PL1X2
	Gilroy Energy Center, Unit #3	GILRPP_1_PL3X4

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Generation Group	Resource Name	Resource ID
Moss Landing 230	Moss Landing Pow er Blocks 1, 2	MOSSLD_2_PSP1, MOSSLD_2_PSP2
Dallas Energy Storage	Dallas Energy Storage	VISTRA_5_DALBT1, VISTRA_5_DALBT2, VISTRA_5_DALBT3
Black Diamond Energy Storage	Black Diamond Energy	BLKDIA_2_BDEBT1
Kelso	Kelso (Mariposa Energy)	KELSO_2_UNITS
MEC	Metcalf Energy Center	METEC_2_PL1X3
Russell City Generation	Russell City Generation	RUSCTY_2_CTG1, RUSCTY_2_CTG2, RUSCTY_2_STG
North Geysers Group	Calpine Geysers Units 5 & 6 Aggregate	GYS5X6_7_UNITS
	Calpine Geysers Units 7 & 8 Aggregate	GYS7X8_7_UNITS
	Geysers Unit 11	GEYS11_7_UNIT11
South Geysers Group	Geothermal Energy Partners 1, 2	ADLIN_1_UNIT 1, ADLIN_1_UNIT 2
	Calpine Geysers CO. L. P. (KW#1 and KW#2)	BEARCN_2_UNIT 1, BEARCN_2_UNIT 2
	Geysers Units 12, 13, 14 (Healdsburg)	GEYS12_7_UNIT12, GEYS13_7_UNIT13, GEYS14_7_UNIT14
	Geysers Unit 16 , 17, 18 (Healdsburg)	GEYS16_7_UNIT16, GEYS17_7_UNIT17, GEYS18_7_UNIT18
	Geysers Unit 20 (Healdsburg)	GEYS20_7_UNIT20
	Geysers Pow er Company, LLC	SANTFG_7_UNITS
	Sonoma Pow er Plant	SMUDGO_7_UNIT 1
	Sonoma County Landfill	SNMALF_6_UNITS
	NCPA Geo Plant 1 Units 1, 2	NCPA_7_GP1UN1, NCPA_7_GP1UN2
	NCPA Geo Plant 2 Units 3, 4	NCPA_7_GP2UN3, NCPA_7_GP2UN4
	Bottlerock	GEYS17_2_BOTRCK
Lambie/Goosehaven/ 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)	RVRVIEW_1_UNITA1
Calpeak/Wolfskill Group	Calpeak Pow er – Vaca Dixon, LLC	VACADX_1_UNITA1
	Wolfskill Energy Center - Calpine	WOLFSK_1_UNITA1

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Generation Group	Resource Name	Resource ID
Transbay cable	Transbay	CISO_POTTBAY_I_WHL_TBAYDC CISO_POTTBAY_E_WHL_TBAYDC
Tosco (Rodeo Plant)	Tosco (Rodeo Plant)	UNOCAL_1_UNITS
Chevron Richmond Refinery	Chevron Richmond Refinery	STOILS_1_UNITS
Shell Oil Refinery Aggregate	Shell Oil Refinery Aggregate	SHELRF_1_UNITS
Berkeley Cogeneration	Berkeley Cogeneration	GRZZLY_1_BERKLY
Crockett Cogen	Crockett Cogen	CROKET_7_UNIT
Martinez Cogen Limited Partnership	Martinez Cogen Limited Partnership	TIDWTR_2_UNITS
Colusa Generating Station	Colusa Generating Station	COLUSA_2_PL1X3

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

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Table 3D: Series Reactors Effectiveness Factors

Estimated Shift in the CALCULATED LOADING across the transmission facilities that make up the LIMIT resulting from the Insertion of the Pittsburg 230 kV Series Reactors and Jefferson-Martin Series Reactors				
ControlPoint	Pittsburg Series Reactors		Jefferson-Martin Series Reactors	
	Increase/Decrease in CALCULATEDLOADING	MW Change in Flow	Increase/Decrease in CALCULATEDLOADING	MW Change in Flow
Pittsburg - San Mateo 230 kV Line & Pittsburg - East Shore 230 kV Line	Decrease	52.1	Increase	2.5
Ravenswood - San Mateo #1 & #2 230 kV Lines & Ravenswood - San Mateo 115 kV Line (←)	Increase	5.0	Increase	3.35
Pittsburg –Tesla #1 & #2 230 kV Lines (←)/(→)	Decrease/Increase	32/42	Increase	2.2
Tesla 500/230 kV Bank #6 Onto Tesla 500/230 kV Bank #4	Decrease	2.9	Increase	2.1
Pittsburg 230/115 kV Banks #12 & #13	Increase	5.5	--	--
Tesla - Ravenswood 230 kV Line & Newark - Ravenswood 230 kV Line & Newark - Ames Distribution 115 kV Line	Increase	3.8	Increase	1.73

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		Effective Date	12/05/24
Effectiveness Factors - All		Distribution Restriction: None	

7330 - Generation Effectiveness Factors San Francisco and Peninsula Areas: (version 12.1, 6/08/23)

Table 2: Generation Effectiveness Factors

Resource IDs →	Trans Bay DC Cable	Ox Mountain Gen
ControlPoints↓	TBC	OXMTN_6_LNDFIL
CP-1: 0.45*AY-2 (→,@Potrero; Potrero - Larkin) + AX-1 (→,@Potrero; Potrero - Mission) - 0.15 * Armed TBC dispatch	Decrease TBC dispatch (~15% effective)	N/A
CP-2: 0.45*AY-2 (→,@Potrero; Potrero - Larkin) + AX-1 (→,@Potrero; Potrero - Mission)	Decrease TBC dispatch (~15% effective)	N/A
CP-3: 0.09 * Jefferson → Martin 230 kV [@Jefferson] + Jefferson → Hillsdale Jct. 60 kV [@Jefferson]	Increase TBC dispatch (~4% effective)	Increase OXMNT_6_LNDFIL (~60% effective)

Note: If CP #3 cannot be met with available TBC and Ox-Mtn., contact PG&E OE for additional options, such as radializing the San Mateo 60 kV system.

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Effectiveness Factors - All		Distribution Restriction: None	


7340 - Generation Effectiveness Factors Silicon Valley Area: (version 3.1, 6/06/24)

Table 3: Generation Effectiveness Factors

Resource ID →	MW increase in the CALCULATED LOADING across the transmission facilities that make up the area LIMIT for 100 MW increase in Generation.				
	SVP PST	DVR (Donald Von Raesfeld)	Gianera	LECEF (Los Esteros Energy Facility)	Gilroy
	Control Point ↓	SVP PST	DUANE_1_PL1X3	CSCGNR_1_UNIT1 CSCGNR_1_UNIT2	LECEF_1_UNITS
0.70* NRS - Scott #1 115 kV line (→, @NRS) + NRS-Scott#2 115 kV line (→, @NRS)	22	-47	-8	3	-2
CP #27 from OP 7320: 1.00 * Metcalf - El Patio #1 115 kV line (->, @Metcalf)+ 0.43 * Metcalf - El Patio #2 115 kV line (->, @Metcalf)	5	10	10	7	-8

Note: SVP PST is operated by Silicon Valley Power. DVR and Gianera are operated by NCPA. For mitigation using any of these options (SVP PST, DVR, and/or Gianera), coordinate with SVP. Refer to procedure 7340 for mitigation instructions.

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Effectiveness Factors - All		Distribution Restriction: None

7410 - Effectiveness Factors for Tesla/Bellota Area: (version 9.7, 11/21/24)

Table 3A-1: Generation Effectiveness Factors – Combined Limits

Resource IDs → Control Points ↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.								
	Beardsley	Donnells	Pacifica Ultra Power	Sand Bar	Spring Gap	Stanislaus PH	Tulloch Unit 1 & 2	GWF Tracy 1 & 2	Ripon Cogen
	BEARDS_1 UNIT1	DONNLS_7 UNIT	ULTPCH_1 UNIT 1	SNDBAR_7 UNIT 1	SPRGAP_1 UNIT 1	STANIS_7 UNIT 1	TULLCK_7 UNITS	SCHLTE_1 UNIT A1, A2	SMPRIP_1 SMPSON
CP #2 0.72 x Tesla - Schulte No.1 115 kV (→, @Tesla)+ Tesla - Schulte No.2 115 kV (→, @ Tesla)	-20	-20	-20	-20	-20	-30	-20	-65	+5
CP #3 0.72 x Tesla-Schulte No.1 115 kV (<-, @Tesla)+ Tesla - Schulte No.2 115 kV (<-, @ Tesla)	20	20	20	20	20	30	20	65	-5
CP #6 0.59*Schulte - Lammers 115 kVline (@ Schulte)+ Schulte - Manteca 115 kV line (@ Schulte) - 0.15* 60 MW generation reduction at GWF Tracy	-25	-22	-30	-20	-17	-27	-19	+15	+3

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Procedure No.	2210Z
Version No.	29.3
Effective Date	12/05/24

Effectiveness Factors - All

**Distribution Restriction:
None**


Resource IDs → Control Points↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.								
	Beardsley	Donnells	Pacifica Ultra Power	Sand Bar	Spring Gap	Stanislaus PH	Tulloch Unit 1 & 2	GWF Tracy 1 & 2	Ripon Cogen
	BEARDS_1 UNIT1	DONNLS_7 UNIT	ULTPCH_1 UNIT 1	SNDBAR_7 UNIT 1	SPRGAP_1 UNIT 1	STANIS_7 UNIT 1	TULLCK_7 UNITS	SCHLTE_1 UNIT A1, A2	SMPRIP_1 SMPSON
CP #7 0.59* Schulte - Lammers 115 kVline (@ Schulte) + Schulte - Manteca 115 kV line (@ Schulte)	-25	-22	-30	-20	-17	-27	-19	+15	+3
CP #9 Schulte Sw Sta - Manteca 115 kV Line (→ @ Manteca) +0.78 * Vierra -Tracy - Kasson 115 kVLine (<- @ Vierra)	-30	-30	-32	-30	-30	-36	-30	+11	+2
CP #18 0.30*Bellota-Riverbank-Melones 115 kV Line (→, @ Melones) + 1.00*Ripon-Manteca 115 kV Line (←, @ Manteca)	-57	-43	-44	-53	-60	-37	N/A	-65	N/A

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Effectiveness Factors - All		Distribution Restriction: None


Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.								
	Beardsley	Donnells	Pacifica Ultra Power	Sand Bar	Spring Gap	Stanislaus PH	Tulloch Unit 1 & 2	GWF Tracy 1 & 2	Ripon Cogen
	BEARDS_1 UNIT1	DONNLS_7 UNIT	ULTPCH_1 UNIT 1	SNDBAR_7 UNIT 1	SPRGAP_1 UNIT 1	STANIS_7 UNIT 1	TULLCK_7 UNITS	SCHLTE_1 UNIT A1, A2	SMPRIP_1 SMPSON
CP #19 0.51*Schulte SW Sta-Kasson-Manteca 115 kV Line (→, @ Manteca) + 1.00*Manteca-Vierra 115 kV Line (←, @ Vierra)	-54	-48	-57	-56	-57	-42	N/A	7	N/A

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Effectiveness Factors - All		Distribution Restriction: None	

Resource IDs →	MW increase in the <u>calculated</u> loading across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.											
	Beardsley	Donnells	Pacifica Ultra Power	Sand Bar	Spring Gap	Stanislaus PH	Tulloch Unit 1 & 2	GWF Tracy 1 & 2	Ripon Cogen	Paulsell BESS	Paulsell PV	North Central Valley Battery
Control Points↓	BEARDS_1 UNIT1	DONNLS_7 UNIT	ULTPCH_1 UNIT 1	SNDBAR_7 UNIT 1	SPRGAP_1 UNIT 1	STANIS_7 UNIT 1	TULLCK_7 UNITS	SCHLTE_1 UNIT A1, A2	SMPRIP_1 SMPSON	PALSEL_6_PLS BT1	PALSEL_6_PLS SR1	NORCNV_1_NCVB T1
CP #24 Crow Creek SW Sta- Newman 60 kV Line (→, @ Crow Creek SW Sta) + Salado- Crow Creek Sw Sta 60 kV Line (<- @ Salado)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100	N/A
CP #25 0.90* Bellota 230/115kV Bank #2 (→, @ 230 kV) + Bellota 230/115kV Bank #1 (→, @ 230 kV)	-44	-44	-45	-44	-44	-35	-55	-7	N/A	N/A	N/A	85

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MW increase in the <u>calculated</u> loading across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.												
Resource IDs →	Beardsley	Donnells	Pacifica Ultra Power	Sand Bar	Spring Gap	Stanislaus PH	Tulloch Unit 1 & 2	GWF Tracy 1 & 2	Ripon Cogen	Paulsell BESS	Paulsell PV	North Central Valley Battery
Control Points ↓	BEARDS_1 UNIT1	DONNLS_7 UNIT	ULTPCH_1 UNIT 1	SNDBAR_7 UNIT 1	SPRGAP_1 UNIT 1	STANIS_7 UNIT 1	TULLCK_7 UNITS	SCHLTE_1 UNIT A1, A2	SMPRIP_1 SMPSON	PALSEL_6_PLS BT1	PALSEL_6_PLS SR1	NORCNV_1_NCVB T1
CP #26 Salado- Crow Creek Sw Sta 60 kV Line (<- @ Salado)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	84	84	N/A

Note: If all listed Generation for CP's 2, 6, and 7 has been exhausted, then consider reconfiguration and/or shedding Load at the Manteca and Racetrack substations.

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Table 3A-2: Generation Effectiveness Factors – Combined Limits

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.												
	Electra	Tiger Creek	Salt Spring	Collierville	Melones PH	Kirkwood	Holm	Middle Fork	Drum Area Gen***	East of Manteca Hydro	Feather River Hydro*	Fresno Area Gen****	Bay Area Gen**
	ELECTR .UNIT 1, 2, 3	TIGRCK .UNIT 1, 2	SALTSP.UNI T 1, 2	COLVIL .UNIT 1, 2	(BANC)	INTKEP .KIRKW1, 2, 3	INTKEP .HOLM 1, 2	MDFKRL_2 _PROJECT					
CP #4 0.32 x Bellota-Tesla No. 2 230 kV line (->) + Bellota-Weber 230 kV line (->)	+25	+25	+25	+26	+20	+20	+20	+7	+7	+7	+7	+5	-2.5
CP #8 0.32 x Bellota-Tesla No. 2 230 kV line (<-) + Weber-Tesla 230 kV line (<-)	-25	-25	-25	-26	-20	-20	-20	-7	-7	-7	-7	-5	+2.5

* Feather River Hydro = Poe PH, Cresta PH, Rock Creek PH, Bucks Creek PH

** Bay Area Gen = DEC, LMEC, Pittsburg, Gateway

***Drum Area Gen = Drum, Dutch Flat, Chicago Park, Bowman, Spaulding, etc.

****Fresno Area Gen = Kerckhoff, Hass, Helms, Exchequer, Pine Flat, etc.

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Effectiveness Factors - All		Distribution Restriction: None

Table 3B-1: Generation Effectiveness Factors – Individual Lines

Resource IDs → Control Points↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.								
	Beardsley	Donnells	Pacifica Ultra Power	Sand Bar	Spring Gap	Stanislaus PH	Tulloch Unit 1 & 2	GWF Tracy 1 & 2	Ripon Cogen
	BEARDS_1 UNIT1	DONNLS_7 UNIT	ULTPCH_1 UNIT 1	SNDBAR_7 UNIT 1	SPRGAP_1 UNIT 1	STANIS_7 UNIT 1	TULLCK_7 UNITS	SCHLTE_1 UNIT A1, A2	SMPRIP_1 SMPSON
Tesla-Tracy 115 kV line	-15	-15	-16	-15	-15	-19	-12	-10	+2
Tesla-Schulte No.2 115 kV line	-13	-15	-16	-15	-15	-19	-12	-69	+2
Schulte-Manteca 115 kV line (Kasson Jct – Manteca section)	-20	-22	-24	-22	-22	-27	-18	+5	+2
Tesla-Schulte No.1 115 kV line	-14	-14	-16	-14	-14	-18	-13	-10	+2
Tesla – Salado – Manteca 115 kV line (Ingram Creek - Manteca)	-6	-6	-7	-6	-7	-9	-6	-2	+1
Lawrence Livermore Lab - Tesla 115 kV line (->/<-)	-42 42	-42 42	-42 42	-42 42	-42 42	-42 42	-42 42	-62 67	N/A

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Effectiveness Factors - All		Distribution Restriction: None

Table 3B-2: Generation Effectiveness Factors – Individual Lines

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.						
	Electra	Tiger Creek	Salt Spring	Collierville	Melones PH	Kirkwood	Holm
	ELECTR .UNIT 1, 2, 3	TIGRCK .UNIT 1, 2	SALTSP.UNIT 1, 2	COLVIL .UNIT 1, 2	(BANC)	INTKEP .KIRKW1, 2, 3	INTKEP .HOLM 1, 2
Bellota - Tesla No. 2 230 kV line (→)	+19	+19	+18	+20	+15	+15	+15
Bellota-Weber 230 kV line (→)	+20	+20	+18	+20	+15	+15	+15

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Effectiveness Factors - All		Distribution Restriction: None

7420 - HHWP Warnerville-Standiford Lines #7 and #8 Operations: (version 6.4, 7/26/24)

Table 3: Generation Effectiveness Factors on Calculated Loading

Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation										
	Intake units	ELCAP_1_SOLAR	EXCHEC_7_UNIT 1	CHWCHL_1_BIOMAS	CHWCHL_1_BIOMAS	TIGRCK_7_UNITS	SALTSP_7_UNITS	COLVIL_7_PL1X2	HEMMPG_7_UNIT1	HEMMPG_7_UNIT2	HEMMPG_7_UNIT3
CP #1: Warnerville – Standiford #8 115 kV line + Warnerville – Standiford #7 115 kV line	+17	+6	+7	+6	+6	+5	+5	+5	+4	+4	+4

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 California ISO	Operating Procedure	Procedure No.	2210Z
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Effectiveness Factors - All		Distribution Restriction: None	


7430 - Effectiveness Factors for the Fresno Area: (version 27.1, 7/25/24)

Note: When operating constraints allow increasing and decreasing should be done in pairs. It is recommended to try and match the best increase option with the best decrease option for maximum effectiveness. If this is done, then their effectiveness factors can be added together resulting in a more accurate number.

Table 3A: Generation Effectiveness Factors on Calculated Loading


Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation																		
	Balch #1	Balch #2	CalPeak Power Panoche	CAPCO Madera	Chevron USE (Coalinga)	Chowchilla	Dinuba	Dynamis CoGen	Exchequer	Fresno CoGen (Agrico)	Friant Dam	GWF Henrietta Peaker Plant	Haas	Helms in Pump Mode	Helms in Gen Mode	HEP Peaker Plant & GWF Hanford	JR Wood	Huron Solar	Cantua Solar
CP #1: 0.78* Gates - Mustang #2 230 kV line (→, @Gates) + Gates - Mustang #1 230 kV line (→, @Gates)	-37	-39	-5	-20	+4	-21	-37	-37	-18	-12	-33	-66	-39	33	-33	-52	-18	-	-4
CP #6: 0.44* Gregg - Wilson 230 kV line (→, @Gregg) + Gregg-Borden 230 kV line (→, @Gregg)	13.1	10.1	1.6	-5.4	3.9	-7.2	12.3	12.4	-13.5	5.9	-70.5	9.8	10.1	-22.0	22.0	10.7	-21.7	0	0
CP #7: Merced 115/70 bank #2 (<, @115 kV) + Exchequer - Le Grand 115 kV line (→, @Exchequer)	-0.3	-0.2	-0.7	-2.3	-0.2	-3.2	-0.2	-0.2	100	-0.3	0.1	-0.1	-0.2	-0.1	0.1	-0.1	1.3	0	0.
Warnerville - Wilson 230 kV Line	-15.9	-12.7	-10.3	-18.4	-7.3	-24.3	-15.2	-15.2	-25.7	-10.7	-23.7	-10.8	-12.6	22.0	-22.0	-12.7	-33.5	-11.1	-10
CP # 8: 0.51* Melones - Wilson 230 kV Line (->, @ Wilson) + Warnerville - Wilson 230 kV Line (->, @Wilson)	-17.8	-15.4	-12.2	-24	-11.1	-31	-16.3	-18.4	-34	-11	-27.2	-16.0	-15.1	23.8	-23.8	-14.0	-26.3	0	-10

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Effectiveness Factors - All		Distribution Restriction: None	

Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation																		
	Balch #1	Balch #2	CalPeak Power Panoche	CAPCO Madera	Chevron USE (Coalinga)	Chowchilla	Dinuba	Dynamis CoGen	Exchequer	Fresno CoGen (Agrico)	Friant Dam	GWF Henrietta Peaker Plant	Haas	Helms in Pump Mode	Helms in Gen Mode	HEP Peaker Plant & GWF Hanford	JR Wood	Huron Solar	Cantua Solar
CP # 11: 0.05* Tranquillity - Kearney 230 kV Line (->, @Tranquillity) + Wilson - Oro Loma 115 kV Line (->, @ Oro Loma)	-3.5	-7.6	-2.0	-3.4	0	-8.3	0	-2.6	-9.1	0	0	-	-1.5	3.9	-3.9	-2	-26.3	0	0
CP # 12: 0.19* Tranquillity - Kearney 230 kV Line (->, @Tranquillity) + Warnerville - Wilson 230 kV Line (->, @Wilson)	-21.4	-13.4	-8.1	-20.9	-2.6	-29.1	-18.1	-26.6	-32.1	-9.0	-25.6	-13	-15.1	27.2	-27.2	-16	-26.3	-11.1	-11.1
CP#16: 0.15 * Panoche - Mendota 115 kV line (->, @ Mendota) + Panoche - Oro Loma 115 kV line (->, @ Panoche)	-	-	+6	-9	-	-	-	-	-8	+2	-2	-	-	2	-2	-	-10	-	-
CP #17: 0.73 * Panoche - Mendota 115 kV line (->, @ Mendota) + Wilson - LeGrand 115 kV line (->, @ LeGrand)	-4	-4	-	-	-	-67	-6	-	-65	-	-	-	-4	-	-	-2	+7	-	-
Panoche-Oro Loma 115 kV Line	-	-	+6	-9	-	-	-	-	-8	+2	-2	-	-	2	-2	-	-10	-	-
CP #18: 0.51* Bellota - Cottle 230 kV Line (->, @ Bellota) + Warnerville - Wilson 230 kV Line (->, @Wilson)	-17.8	-15.4	-9	0	-11.1	-31	-16.3	-18.4	-34	-11	-27.2	-16.0	-15.1	23.8	-23.8	-14.0	-26.3	0	-10
CP# 19: 0.81 * Wilson 230/115 kV TB#2 (->) + Wilson 230/115 kV TB#1 (->)	-2	-2	-6	-	-	-42	-2	-	-53	-	+4	-	-2	-3	3	-	-70	-	-

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Effectiveness Factors - All		Distribution Restriction: None

Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation																		
	Balch #1	Balch #2	CalPeak Power Panoche	CAPCO Madera	Chevron USE (Coalinga)	Chowchilla	Dinuba	Dynamis CoGen	Exchequer	Fresno CoGen (Agrico)	Friant Dam	GWF Henrietta Peaker Plant	Haas	Helms in Pump Mode	Helms in Gen Mode	HEP Peaker Plant & GWF Hanford	JR Wood	Huron Solar	Cantua Solar
CP # 20: 0.20* Mustang - Gregg 230 kV Line (→, @ Gregg) + Warnerville - Wilson 230 kV Line (->, @Wilson)	-14	-11	-7	-21	-3	-25	-13	-14	-30	-7	-24	-5	-11	22	-22	-8	-36	-3	-6

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Table 3B: Generation Effectiveness Factors on Calculated Loading

Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation																	
	Kerckhoff #1 & #2	Kings River	KRCD	McSwain	Merced Falls	Starwood Power - Midway LLC	Panoche Energy Center	Panoche Peaker	PE-KES Kingsburg	Pine Flat	Rio Bravo Fresno (Ultrapower)	San Joaquin 2	Wishon	Collierville, Tiger Creek, Electra	Melones (BANC)	CCSF Hetch_Hetchy Hydro	Giffen Solar	Kansa Solar
CP #1: 0.78 * Gates - Mustang #2 230 kV line (→, @Gates) + Gates - Mustang #1 230 kV line (→, @Gates)	-33	-37	-37	-18	-18	-5	-4	-5	-40	-38	-37	-33	-33	-3	-10	-	-11	-58
CP #6: 0.44 * Gregg - Wilson 230 kV line (→, @Gregg) + Gregg - Borden 230 kV line (→, @Gregg)	10.7	12.3	12.3	-14.9	-15.0	1.6	4.5	3.1	11.3	10.2	12.3	-73.0	-72.9	5.7	14	10.2	+10	+10
CP #7: Merced - Merced Falls (<-, @ Merced) + Exchequer - Le Grand 115 kV line (→, @Exchequer)	-0.8	-0.2	-0.2	100	100	-0.7	-0.1	-0.1	-0.2	-0.2	-0.2	0.1	0.1	0.0	0.0	0.0	0	0
Warnerville - Wilson 230 kV Line	-19.0	-15.0	-15.1	-27.2	-27.2	-10.2	-7.3	-8.5	-14.0	-12.9	-15.1	-24.6	-24.6	+5.7	-12.0	+23	-10	-10
CP # 8: 0.51* Melones-Wilson 230 kV Line (->, @ Wilson) + Warnerville - Wilson 230 kV Line (->, @Wilson)	-23.5	-17.0	-18.0	-33.3	-33.3	-13.1	-9.8	-10.2	-14.7	-14.2	-20.6	-23.0	-23.0	+8.0	+7.5	+23	-15	-10
CP # 11: 0.05* Tranquillity - Kearney 230 kV Line (→, @Tranquillity) + Wilson - Oro Loma 115kV Line (<-, @ Oro Loma)	-5.5	-2.5	-2.0	-33.3	0	+1.6	+1.9	+4.0	-2.9	-2.2	0	0.0	0	-1.8	+3.6	-3.3	0	0


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Effectiveness Factors - All		Distribution Restriction: None

Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation																	
	Kerckhoff #1 & #2	Kings River	KRCD	McSwain	Merced Falls	Starwood Power - Midway LLC	Panoche Energy Center	Panoche Peaker	PE-KES Kingsburg	Pine Flat	Rio Bravo Fresno (Ultrapower)	San Joaquin 2	Wishon	Collierville, Tiger Creek, Electra	Melones (BANC)	CCSF Hetch_Hetchy Hydro	Giffen Solar	Kansa Solar
CP #12: 0.19* Tranquillity - Kearney 230 kV Line (→, @Tranquillity) + Warnerville - Wilson 230 kV Line (→, @Wilson)	-22.2	-20.0	-18.0	-33.3	-34.4	-9.8	-5.8	-6.1	-17.6	-15.5	-2.9	0.0	-22.2	+5.4	-13.3	+23.3	-11.1	-10
CP #16: 0.15 * Panoche - Mendota 115 kV line (->,@ Mendota) + Panoche - Oro Loma 115 kV line (->, @ Panoche)	-2	-	-	-8	-2	+8	+3	+6	-	-	-	-2	-2	-	-3	-2	-	-
CP #17: 0.73 * Panoche - Mendota 115 kV line (->,@ Mendota) + Wilson - LeGrand 115 kV line (->, @ LeGrand)	-15	-5	-5	-51	-	-	-	-	-5	-4	-5	-	-	-	-	-	-	-
Panoche-Oro Loma 115 kV Line	-2	-	-	-8	-2	+8	+3	+6	-	-	-	-2	-2	-	-3	-2	-	-
CP #18: 0.51* Bellota - Cottle 230 kV Line (->, @ Bellota) + Warnerville - Wilson 230 kV Line (->, @Wilson)	-23.5	-17.0	-18.0	-33.3	-33.3	-13.1	-9.8	-10.2	-14.7	-14.2	-20.6	-23.0	-23.0	+8.0	+42	+23	-15	-10
CP # 19: 0.81 * Wilson 230/115 kV TB #2 (->) + Wilson 230/115 kV TB #1 (->)	-8	-2	-2	-54	-54	-6	-3	-6	-2	-2	-2	+4	+4	+2	+6	+5	-	-
CP # 20: 0.20* Mustang - Gregg 230 kV Line (→, @ Gregg) + Warnerville - Wilson 230 kV Line (->, @Wilson)	-17	-14	-14	-31	-31	-5	-6	-5	-12	-11	-12	-24	-24	+7	-12	+27	-8	-5

Note 1: Dropping a Helms pump has the same effect as increasing Helms Generation. The ID for each pump is: HELMPG_7_#100LD, HELMPG_7_#200LD, HELMPG_7_#300LD

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Effectiveness Factors - All		Distribution Restriction: None

Note 2: Units with an RMR or RA contract will be dispatched first, and the market units second. RA unit portfolio changes on a monthly basis, so, check the list of RA units prior to adjusting generation.

Table 3C: Generation Effectiveness Factors on Calculated Loading

Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation						
	Waukena Solar	CID Solar	Corcoran City	FreshWater Solar	Little Bear Solar	NorthStar	Cal Renew
CP #13: Kingsburg - Corcoran 115 kV #1 (<-, @Kingsburg) + Kingsburg - Waukena 115 kV (<-, @Kingsburg)	100	100	100	100	-	-	-
CP #21: Mendota - Panoche 115 kV (->, @Mendota) + Mendota - Dairyland 115 kV (->, @Mendota)	-	-	-	-	100	100	100

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Effectiveness Factors - All		Distribution Restriction: None

7440 - Effectiveness Factors for the Los Padres Area: (version 4.0, 10/28/24)

Table 3: Effectiveness Factors

Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation					
	Topaz Solar TOPAZ_2_SOLAR	CVSR CAVLSR_2_BSOLAR CAVLSR_2_RSOLAR	Sunset SUNSET_2_UNITS	Sunrise SUNRIS_2_PL1X3	Elk Hills ELKHIL_2_PL1X3	La Paloma LAPLMA_2_UNIT 1 LAPLMA_2_UNIT 2 LAPLMA_2_UNIT 3 LAPLMA_2_UNIT 4
CP #1: 0.53* Morro Bay - Solar #2 230 kV line (<-, @Solar) + Morro Bay-Solar #1 230 kV line (<-, @Solar)	+20	+16	+4	+3.5	+3.5	+3.4

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Table 3: Effectiveness Factors – *Continued*

Loading Equation	MW increase in the loading across the transmission facilities that make up the loading equation for a 100 MW increase in Generation						
	Dallas Battery Energy Storage VISTRA_5_DALBT1 VISTRA_5_DALBT2 VISTRA_5_DALBT3 VISTRA_5_DALBT4	Moss Landing Power Blocks MOSSLD_2_PSP1 MOSSLD_2_PSP2	Metcalf Energy Center	Gilroy Co-gen GILROY_1_UNIT	Panoche Valley Solar PNCHVS_2_SOLAR	Panoche Energy Center PNCHEG_2_PL1X4	Tranquility Solar TRNQL8_2_AMASR1 TRNQL8_2_AZUSR1 TRNQL8_2_ROJSR1 TRNQL8_2_VERSR1 TRNQLT_2_SOLAR
CP #2: 0.10* Moss Landing - LosBanos 500 kV line (<-, @Moss Landing) + Moss Landing - Las Aguilas 230 kV line (<-, @Moss Landing)	-6.0	-12.0	-5.0	-4.5	20.0	12.0	10.0

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Effectiveness Factors - All		Distribution Restriction: None

7450 - Effectiveness Factors for Midway-Kern Area: (version 2.8, 4/01/24)

Table 3 - Part 1: Generation Effectiveness Factors – System Operating Limits

Resource IDs→ Control Points↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Live Oak	Mt. Poso	Dexzel	Discovery Chevron Santa Fe Co-gen	Bear Mountain	Kern Front Double C High Sierra Badger Creek
	LVOAK_1_UNIT 1	MTNPOS_1_UNIT	DEXZEL_1_UNIT	DISCOV_1_CHEVRN VEDDER_1_SEKERN	BEARMT_1_UNIT	KERNFT_1_UNITS DOUBL C_1_UNITS SIERRA_1_UNITS BDGRCK_1_UNITS
CP #1a: Smyrna – Semitropic - Midw ay 115 kV line (IN @ Semitropic) + 0.75* Semitropic - Midw ay #1 115 kV line (OUT @ Midw ay)	-8	-36	-10	-10	-7	-5
CP #1b: Semitropic - Midw ay #1 115 kV line (OUT @ Midw ay) + 0.80* Smyrna – Semitropic - Midw ay 115 kV line (IN @ Semitropic)	-8	-36	-10	-10	-7	-5
CP #2: Kern – Westpark #1-115 kV line (→, @ Kern) + Kern – Westpark #2-115 kV line (→, @ Kern)	-5	-4	-8	-9	-64	-
CP #3a: Kern – Magunden - Witco 115 kV line (OUT @ Kern) + 0.63* (Westpark - Magunden 115 kV line (OUT @ Westpark) + Bear Mnt - Cal Water TB #1)	-30	-20	-45	-50	-	-

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Resource IDs→ Control Points↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Live Oak	Mt. Poso	Dexzel	Discovery Chevron Santa Fe Co-gen	Bear Mountain	Kern Front Double C High Sierra Badger Creek
	LIVOAK_1_UNIT 1	MTNPOS_1_UNIT	DEXZEL_1_UNIT	DISCOV_1_CHEVRN VEDDER_1_SEKERN	BEARMT_1_UNIT	KERNFT_1_UNITS DOUBLC_1_UNITS SIERRA_1_UNITS BDGRCK_1_UNITS
CP #3b: Kern – Magunden - Witco 115 kV line (OUT @ Kern) + 0.63* (Westpark - Magunden 115 kV line (OUT @ Westpark) + Westpark TB #3)	-30	-20	-45	-50	-63	-
CP #3c: Kern – Magunden - Witco 115 kV line (IN @ Magunden) + Westpark - Magunden 115 kV line (OUT @ Westpark) + Westpark TB #3	-	-	-	-	-100	-
CP #4: Semitropic - Charca 115 kV line (OUT @ Semitropic) + Lerdo - Kern Oil - 7th Standard 115 kV line (IN @ Lerdo)	-	-100	-	-	-	-

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Table 3 - Part 2: Generation Effectiveness Factors – System Operating Limits

Resource IDs→ Control Points↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Pump Jack Solar Kernridge Mckittrick	Berry Co-gen 18 Cadet Co-gen	Maricopa West South Kern Solar	Kern Canyon Kern Hydro	Adobe Solar	Chalk Cliff Berry Cogen 38
	PMPJCK_1 KERNRG_1_UNITS MKTRCK_1_UNIT 1	TANHIL_6_SOLAR CHEVCD_6_UNIT	MARCPW_6_SOLAR1 SKERN_6	KRNCNY_6_UNIT RIOBRV_6_UNIT 1	ADOBEE_1_SOLAR	CHALK_1_UNIT UNVRSY_1_UNIT
CP #5: Weedpatch - San Bernard 70 kV line (IN @ Weedpatch) + 0.69* Wheeler Ridge - Weedpatch 70 kV line (OUT @ WR) + Arvin TB #1	-	-	-	-42	7	-
CP #6: Taft TB #2 (115 to 70 kV, @ 70 kV) + 0.95*Taft TB #1 (115 to 70 kV, @ 70 kV)	-	-75	-	-	-	8
CP #10: Midway – Belridge 115 kV Line (←, @ Midway) + San Luis Obispo - Temblor 115 kV line (←, @ San Luis Obispo)	100	-	-	-	-	-
CP #11: Copus - Old River 70 kV line (IN @ Old River) + Taft-Maricopa 70 kV line (OUT @ Maricopa)	-	-	100	-	-	-
CP #12: Taft - Maricopa 70 kV line (OUT @ Taft) + Berry Co-gen + 0.39* Kern - Old River #1-70 kV line (IN @ Old River)	-	-7	-	-	-	9

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7500 - Effectiveness Factors for Big Creek Area: (version 2.1, 6/08/23)

Table 3: Generation Effectiveness Factors of Big Creek Generators

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.		
	66 kV Gen (Kawgen) (Wellgen, Ultragen, Lakegen)	Big Creek	Eastwood (Pump/Gen)
	(RECTOR_2_QF) (VESTAL_2_WELLHD, VESTA_6_ULTRGN, VESTAL_2_RTS042, VESTAL_6_QF)	BIGCRK_2_EXESWD	EASTWD_7_UNIT
Magunden – Vestal #1 + #2	67%	~50%	47%

Note: Big Creek is Dispatched as an aggregate due to water restrictions; the Effectiveness Factor is an approximate as it was calculated with respect to the entire Big Creek Project.


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7510 - Effectiveness Factors for Big Creek Area Corridor Generators (South of Magunden): (version 6.1, 8/10/23)

Table 4: Generation Effectiveness Factors of Big Creek Area Corridor Generators


Resource IDs →	MW increase in the <u>calculated Loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Big Creek/Mammoth/ Eastwood	Sycamore Canyon/Omar	66 kV Gen (Vestal, Ceducr, and Rector)	Pastoria	Warne
	BIGCRK_2_EXESWD EASTWD_7_UNIT	SYCAMR_2_UNIT1 thru 4 OMAR_2_UNIT1 thru 4	VESTAL_2_KERN VESTAL_2_RTS042 VESTAL_2_SOLAR 1,2 VESTAL_2_UNIT1 VESTAL_2_WELLHD VESTAL_6_QF CEDUCR_2_SOLAR 1 thru 4 RECTOR_2_CREST RECTOR_2_KAWEAH RECTOR_2_KAWH 1 RECTOR_2_QF	LEBECS_2_UNITS	WARNE_2_UNIT
Control Points↓					
CP#1	22	26	24	-11	-8
CP#2	20	23	22	33	61
CP#3, #4, #5	36	42	40	-18	-12
CP#6, #7	33	36	35	48	72

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Effectiveness Factors - All		Distribution Restriction: None

Resource IDs →	MW increase in the <u>calculated Loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Big Creek/Mammoth/ Eastwood	Sycamore Canyon/Omar	66 kV Gen (Vestal, Ceducr, and Rector)	Pastoria	Warne
	BIGCRK_2_EXESWD EASTWD_7_UNIT	SYCAMR_2_UNIT1 thru 4 OMAR_2_UNIT1 thru 4	VESTAL_2_KERN VESTAL_2_RTS042 VESTAL_2_SOLAR 1,2 VESTAL_2_UNIT1 VESTAL_2_WELLHD VESTAL_6_QF CEDUCR_2_SOLAR 1 thru 4 RECTOR_2_CREST RECTOR_2_KAWEAH RECTOR_2_KAWH 1 RECTOR_2_QF	LEBECS_2_UNITS	WARNE_2_UNIT
Control Points ↓					
CP#8	36	40	39	50	N/A
CP#9	22	24	23	32	64
CP#10	23	25	24	33	N/A

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Effectiveness Factors - All		Distribution Restriction: None

7540 - Effectiveness Factors for Path 60 Inyo Tie: (version 2.1, 10/12/23)

Table 4: Path 60 Generation Effectiveness Factors (Flows from SCE to LADWP)

Control Points↓ Resource IDs →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.		
	Mammoth/ Oxbow/ Bishop Creek	Coso Finance Partners/ North American Argus	Borax/ Mojave Cogen/ Coolwater 1&2/ Luz Solar Partners 3-7
CONTRL_1_CASAD1&3 CONTRL_1_OXBOW BISHOP_1_ALAMO BISHOP_1_UNITS	CALGEN_1_UNITS SEARLS_7_ARGUS	HOLGAT_1_BORAX CWATER_7_UNIT 1&2 KRAMER_1_SEGS37	
CP#1 CP#2	42	11	3

Notes: The effectiveness factors are based on a steady-state condition, and may differ under real-time conditions.
 *When the flows are from LADWP to SCE, the table above has the reverse effectiveness.

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7550 - Effectiveness Factors for Vincent Banks: (version 9.2, 1/04/24)

Table 3B: Generation Effectiveness Factors to mitigate AA bank overload for one of the AA bank contingency with all AA Banks in service

Resource IDs → Combined Control Points ↓	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.								
	Pastoria	Ormond Beach	Huntington Beach	El Segundo / Glen Arm	Harborgen Units / Arco gen / Long Beach Center Peaker	Walnut Creek	Alamitos Units	Big Creek	Etiwanda / Mountainview Sentinel Units/
	LEBECS_2_UNITS	ORMOND_7_UNIT 1 & 2	HNTGBH_2_PL1X3 HNTGBH_7_UNIT 2	ELSEGN_2_UN101 1 ELSEGN_2_UN202 1 GLNARM_2_UNIT 1 -4 GLNARM_2_UNIT 5	HARBGN_7_UNITS ARCOGN_2_UNITS HINSON_6_LBECH1 -4 CENTER_6_PEAKE R	WALCRK_2_CTG1-CTG5	ALAMIT_2_PL1X3 ALAMIT_7_UNIT 3 - 5 ALAMIT_7_ES1	BIGCRK_2_EXESWD	MTWIND_1_UNIT 1 - 3 SBERDO_2_PSP3 & 4 SENTNL_2_CTG1-CTG8
2AA or 3AA	-6	-8	-8	-13	-12	-9	-10	-4	-4
1AA or 4AA	-9	-15	-8	-14	-13	-12	-11	-7	-5

Study Reference: These effectiveness factors are based on a normal steady-state condition, and may differ under Real-Time conditions. The reference bus used in the study was Morro Bay.

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Effectiveness Factors - All		Distribution Restriction: None

7570 - Effectiveness Factors for Prior Outage of Vincent – Mesa or Mira Loma – Mesa: (version 13.1, 12/08/23)

Table 3A: Lugo-Mira Loma #3 Generation Effectiveness Factor with prior outage of Vincent-Mesa

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Grape land Peaker / Etiwanda units / Mira Loma Peakers / Mountain View units	Sentinel/ Canyon Power Plant units	RedBluff / Colorado River Solar	Huntington Beach / Alamitos gen / Walnut Creek Energy	El Segundo / Long Beach / Harborgen / Center / ARCO gen	Buck Blvd
	ETWIND_6_GRPLND MIRLOM_6_PEAKE SBERDO_2_PSP3 SBERDO_2_PSP4	SENTNL_2_C CTG1-8 ANAHM_2_CANY N1-4	DSRTSN_2_SOLAR1 DSRTSN_2_SOLAR2 GENESI_2_STG	HNTGBH_7_UNIT1 HNTGBH_7_UNIT2 ALAMIT_7_UNIT 1-6 WALCRK_2_CTG1-5	ELSEGN_2_UN1011 ELSEGN_2_UN2021 HINSON_6_LBEC H1-4 CENTER_6_PEAKE HARBGN_7_UNITS ARCOGN_2_UNITS	BUCKBL_2_PL1X3
CP#1a ¹ CP#4a CP#6a CP#7a	-39	-35	-24	-32	-29	-15

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Effectiveness Factors - All		Distribution Restriction: None

Table 3A (Continued): Lugo-Mira Loma #3 Generation Effectiveness Factor with prior outage of Vincent-Mesa

Resource IDs → Control Points↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Ormond / Pastoria gen / Big Creek	High Desert / North of Lugo Gen (Solar)	Palomar Energy	Otay Mesa / SDGE Peakers	IV Gen
	ORMOND_7_UNIT 1 ORMOND_7_UNIT 2 LEBECS_2_UNITS BIGCRK_2_EXESWD	HIDSRT_2_UNITS KRAMER_1_SEGS37 KRAMER_2_SEGS89 SANDLT_2_SUNITS	PALOMR_2_PL1X3	BORDER_6_UNITA1 ESCNDO_6_UNITB1 ELCAJN_6_UNITA1 LARKSP_6_UNIT 1 LARKSP_6_UNIT 2 ESCNDO_6_PL1X2 OTAY_6_PL1X2 MRGT_6_MMAREF MRGT_6_MEF2 OGROVE_6_PL1X2 ELCAJN_6_LM6K OTMESA_2_PL1X2 CARLS1_2_CARCT1 CARLS2_1_CARCT1	TERMEX_2_PL1X3 LAROA1_2_UNITA1 LAROA2_2_UNITA1 CSLR4S_2_SOLAR IVSLRP_2_SOLAR1 CNTNLA_2_SOLAR1 CPVERD_2_SOLAR
CP#1a ¹ CP#4a CP#6a CP#7a	6	18	-27	-25	-18

***Swing bus:** Distributed Swing Bus

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Table 3B: Lugo-Mira Loma #3 Generation Effectiveness Factor with prior outage of Mira Loma-Mesa

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Grape land Peaker / Etiwanda units / Mira Loma Peakers / Mountain View units	Sentinel / Canyon Power Plant units	RedBluff / Colorado River Solar	Huntington Beach	Alamitos gen / Walnut Creek Energy	El Segundo / Long Beach / Harborgen / ARCO gen
	ETWND_6_GRPLND MRLM_6_PEAKE SBERDO_2_PSP3 SBERDO_2_PSP4	SENTNL_2_CTG1-8 ANAHM_2_CANY N1-4	DSRTSN_2_SOLAR1 DSRTSN_2_SOLAR2 GENESI_2_STG	HNTGBH_7_UNIT1 HNTGBH_7_UNIT2	ALAMIT_7_UNIT 1-6 WALCRK_2_CTG1-5	ELSEGN_2_UN1011 ELSEGN_2_UN2021 HINSON_6_LBECH1-4 HARBGN_7_UNITS ARCOGN_2_UNITS
CP#1b ¹ CP#4b CP#6b CP#7b	-41	-35	-25	-28	-29	-15

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Table 3B continued: Lugo-Mira Loma #3 Generation Effectiveness Factor with prior outage of Mira Loma-Mesa

	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.					
	Center / Buck Blvd	Ormond / Pastoria gen / Big Creek	High Desert / North of Lugo Gen(Solar)	Palomar Energy	Otay Mesa/ SDGE Peakers	IV Gen
Resource IDs → Control Points ↓	BUCKBL_2_PL1X3 CENTER_6_PEAKE R	ORMOND_7_UNIT 1 ORMOND_7_UNIT 2 LEBECS_2_UNITS BIGCRK_2_EXESW D	HIDSRT_2_UNITS KRAMER_1_SEGS3 7 KRAMER_2_SEGS8 9 SANDLT_2_SUNIT S	PALOMR_2_PL1X3	BORDER_6_UNITA1 ESCND0_6_UNITB1 ELCAJN_6_UNITA1 LARKSP_6_UNIT 1 LARKSP_6_UNIT 2 ESCND0_6_PL1X2 OTAY_6_PL1X2 MRGT_6_MMAREF MRGT_6_MEF2 OGROVE_6_PL1X2 ELCAJN_6_LM6K OTMESA_2_PL1X2 CARLS1_2_CARCT1 CARLS2_1_CARCT1	TERMEX_2_PL1X3 LARO A1_2_UNITA1 LARO A2_2_UNITA1 CSLR4S_2_SOLA R IVSLRP_2_SOLA R1 CNTNLA_2_SOLA R1 CPVERD_2_SOLA R
CP#1b ¹ CP#4b CP#6b CP#7b	-17	9	18	-25	-23	-17

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Table 3C: Mesa - Walnut 230 kV line generation effectiveness Factor for Lugo-Ranch Vista / Lugo – Mira Loma #3 line out with prior outage of Vincent-Mesa

Resource IDs → Control Points	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.					
	Walnut Creek Energy / Huntington Beach	Mountain View / Etiwanda units	Sentinel	Buck Blvd / Red Bluff / Colorado River Solar/ Center	El Segundo / Long Beach / Harborgen / ARCO gen	SDGE Gen
	WALCRK_2_C TG1 WALCRK_2_C TG2 WALCRK_2_C TG3WAL CRK_2_C TG4 WALCRK_2_C TG5 HNTGBH_7_UNIT1 HNTGBH_7_UNIT2	SBERDO_2_PSP3 SBERDO_2_PSP4	SENTNL_2_C TG1-8	BUCKBL_2_PL1X3 DSRTSN_2_SOLAR1 DSRTSN_2_SOLAR2 GENESI_2_STG CENTER_6_PEAKE R	ELSEGN_2_UN1011 ELSEGN_2_UN2021 HINSON_6_LBECH1-4 HARBGN_7_UNITS ARCOGN_2_UNITS	OTMESA_2_PL1X2 PALOMR_2_PL1X3 CARLS1_2_CARCT1 CARLS2_1_CARCT1
CP#2a CP#3a	-46	-9	-7	-4	2	-4

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Table 3D: Mesa - Walnut 230 kV line generation effectiveness Factor for Lugo-Ranch Vista / Lugo – Mira Loma #3 line out with prior outage of Mira Loma-Mesa

Resource IDs →	MW increase in the calculated loading across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.							
	Walnut Creek Energy	Mountain View / Etiwanda units	Sentinel	Huntington Beach / Red Bluff / Colorado River Solar	El Segundo	SDGE Gen	Buck Blvd / Center	Long Beach / Harborgen / ARCO gen
	Control Points↓							
	WALCRK_2_CTG1 WALCRK_2_CTG2 WALCRK_2_CTG3 WALCRK_2_CTG4 WALCRK_2_CTG5	SBERDO_2_P SP3 SBERDO_2_P SP4	SENTNL_2_CTG1-8	HNTGBH_7_UNIT1 HNTGBH_7_UNIT2 DSRTSN_2_SOLAR1 DSRTSN_2_SOLAR2 GENESI_2_STG	ELSEGN_2_UN1011 ELSEGN_2_UN2021	OTMESA_2_PL1 X2 PALOMR_2_PL1 X3 CARLS1_2_CAR CT1 CARLS2_1_CAR CT1	CENTER_6_PEA KER BUCKBL_2_PL1 X3	HINSON_6_LBE CH1-4 HARBGN_7_UNI TS ARCOGN_2_UNI TS
CP#2b CP#3b	-47	-16	-13	-9	6	-8	-5	3

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		Effective Date 12/05/24
Effectiveness Factors - All		Distribution Restriction: None

Table 3E: Lugo-Mira Loma #2 Generation Effectiveness Factor for one CB out with prior outage of Vincent-Mesa

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Mira Loma Peakers	Etiwanda units / Mountain View units / Sentinel/ Canyon Power Plant units	Red Bluff / Colorado River Solar	Huntington Beach / Alamitos Gen / Walnut Creek Energy	El Segundo / Long Beach / Harborgen / ARCO Gen / Center	Buck Blvd
	MIRLOM_6_PEAKE	ETWVND_6_GRPLND SBERDO_2_PSP3 SBERDO_2_PSP4 SENTNL_2_CTG1-8 ANAHM_2_CANY N1-4	DSRTSN_2_SOLAR1 DSRTSN_2_SOLAR2 GENESI_2_STG	HNTGBH_7_UNIT1 HNTGBH_7_UNIT2 ALAMIT_7_UNIT 1-6 WALCRK_2_CTG1-5	ELSEGN_2_UN1011 ELSEGN_2_UN2021 HINSON_6_LBECH1-4 CENTER_6_PEAKE HARBGN_7_UNITS ARCOGN_2_UNITS	BUCKBL_2_PL1X3
CP#8a	-29	-21	-21	-15	-20	-9

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 California ISO	Operating Procedure	Procedure No.	2210Z
		Version No.	29.3
		Effective Date	12/05/24
Effectiveness Factors - All		Distribution Restriction: None	

Table 3E (Continued): Lugo-Mira Loma #2 Generation Effectiveness Factor for one CB out prior outage of Vincent-Mesa

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Ormond / Pastoria / Big Creek	High Desert / North of Lugo Gen (Solar)	Palomar Energy	SDGE Peaker / Otay Mesa	IV Gen
Resource IDs →	ORMOND_7_UNIT 1 ORMOND_7_UNIT 2 LEBECS_2_UNITS BIGCRK_2_EXESWD	HIDSRT_2_UNITS KRAMER_1_SEGS37 KRAMER_2_SEGS89 SANDLT_2_SUNITS	PALOMR_2_PL1X3	BORDER_6_UNITA1 ESCNDO_6_UNITB1 ELCAJN_6_UNITA1 LARKSP_6_UNIT 1 LARKSP_6_UNIT 2 ESCNDO_6_PL1X2 OTAY_6_PL1X2 MRGT_6_MMAREF MRGT_6_MEF2 OGROVE_6_PL1X2 ELCAJN_6_LM6K OTMESA_2_PL1X2 CARLS1_2_CARCT1 CARLS2_1_CARCT1	TERMEX_2_PL1X3 LAROA1_2_UNITA1 LAROA2_2_UNITA1 CSLR4S_2_SOLAR IVSLRP_2_SOLAR1 CNTNLA_2_SOLAR1 CPVERD_2_SOLAR
Control Points ↓					
CP#8a	3	12	-18	-17	-12

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		Effective Date 12/05/24
Effectiveness Factors - All		Distribution Restriction: None

Table 3F: Lugo-Mira Loma #2 Generation Effectiveness Factor for one CB out with prior outage of Mira Loma-Mesa

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Mira Loma Peakers	Eiwanada units / Mountain View units / Sentinel / Canyon Power Plant units	Red Bluff / Colorado River Solar	Huntington Beach	Alamitos Gen / Walnut Creek Energy	El Segundo / Long Beach / Harborgen / ARCO Gen / Buck Blvd
	MIRLOM_6_PEAKER	ETIWND_6_GRPLND SBERDO_2_PSP3 SBERDO_2_PSP4 SENTNL_2_CTG1-8 ANAHM_2_CANYN1-4	DSRTSN_2_SOLAR1 DSRTSN_2_SOLAR2 GENESI_2_STG	HNTGBH_7_UNIT1 HNTGBH_7_UNIT2	ALAMIT_7_UNIT 1-6 WALCRK_2_CTG1-5	ELSEGN_2_UN1011 ELSEGN_2_UN2021 HINSON_6_LBECH1-4 HARBGN_7_UNITS ARCOGN_2_UNITS BUCKBL_2_PL1X3
CP#8b	-30	-21.5	-15	-17	-13	-8

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Effectiveness Factors - All		Distribution Restriction: None

Table 3F (Continued): Lugo-Mira Loma #2 Generation Effectiveness Factor for one CB out with prior outage of Mira Loma-Mesa

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Center	Ormond / Pastoria / Big Creek	High Desert / North of Lugo Gen (Solar)	Palomar Energy	Otay Mesa/ SDGE Peakers	IV Gen
		CENTER_6_PEAKE	ORMOND_7_UNIT 1 ORMOND_7_UNIT 2 LEBECS_2_UNITS BIGCRK_2_EXESWD	HIDSRT_2_UNITS KRAMER_1_SEGS37 KRAMER_2_SEGS89 SANDLT_2_SUNITS	PALOMR_2_PL1X3	BORDER_6_UNITA1 ESCNDO_6_UNITB1 ELCAJN_6_UNITA1 LARKSP_6_UNIT 1 LARKSP_6_UNIT 2 ESCNDO_6_PL1X2 OTAY_6_PL1X2 MRGT_6_MMAREF MRGT_6_MEF2 OGROVE_6_PL1X2 ELCAJN_6_LM6K OTMESA_2_PL1X2 CARLS1_2_CARCT1 CARLS2_1_CARCT1
CP#8b	-11	6	11	-16	-15	-11

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Effectiveness Factors - All		Distribution Restriction: None

Table 3G: Lugo-Ranch Vista Generation Effectiveness Factor for one CB out prior outage of Vincent-Mesa

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Mira Loma Peakers / Mountain View units	Grape land Peaker / Etiwanda units	Sentinel / Canyon Power Plant	Red Bluff / Colorado River Solar	Huntington Beach / Alamitos gen / Walnut Creek Energy	El Segundo / Long Beach / Harborgen / Center / ARCO gen
	MIRLOM_6_PEAKE SBERDO_2_PSP3 SBERDO_2_PSP4	ETWWD_6_GRPLND	SENTNL_2_CTG1-8 ANAHM_2_CANY N1-4	DSRTSN_2_SOLAR1 DSRTSN_2_SOLAR2 GENESI_2_STG	HNTGBH_7_UNIT1 HNTGBH_7_UNIT2 ALAMIT_7_UNIT 1-6 WALCRK_2_CTG1-5	ELSEGN_2_UN1011 ELSEGN_2_UN2021 HINSON_6_LBECH1-4 CENTER_6_PEAKE HARBGN_7_UNITS ARCOGN_2_UNITS
CP#5a	-36	-42	-33	-24	-29	-25

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		Effective Date 12/05/24
Effectiveness Factors - All		Distribution Restriction: None

Table 3G (Continued): Lugo-Ranch Vista Generation Effectiveness Factor for one CB out prior outage of Vincent-Mesa

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Buck Blvd	Ormond / Pastoria gen / Big Creek	High Desert / North of Lugo Gen (Solar)	Palomar Energy	SDGE Peaker / Otay Mesa	IV Gen
		BUCKBL_2_PL1X3	ORMOND_7_UNIT 1 ORMOND_7_UNIT 2 LEBECs_2_UNITS BIGCRK_2_EXESWD	HIDSRT_2_UNITS KRAMER_1_SEGS37 KRAMER_2_SEGS89 SANDLT_2_SUNITS	PALOMR_2_PL1X3	BORDER_6_UNITA1 ESCND0_6_UNITB1 ELCAJN_6_UNITA1 LARKSP_6_UNIT 1 LARKSP_6_UNIT 2 ESCND0_6_PL1X2 OTAY_6_PL1X2 MRGT_6_MMAREF MRGT_6_MEF2 OGROVE_6_PL1X2 ELCAJN_6_LM6K OTMESA_2_PL1X2 CARLS1_2_CARCT1 CARLS2_1_CARCT1
CP#5a	-14	7	17	-25	-24	-17

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Effectiveness Factors - All		Distribution Restriction: None

Table 3H: Lugo-Ranch Vista Generation Effectiveness Factor for one CB out with prior outage of Mira Loma-Mesa

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Mira Loma Peakers / Mountain View units	Grape land Peaker / Etiwanda units	Sentinel / Canyon Power Plant	Red Bluff / Colorado River Solar / Huntington Beach	Alamitos gen / Walnut Creek Energy	El Segundo / Long Beach / Harborgen / ARCO gen
Resource IDs → Control Points ↓	MIRLOM_6_PEAKE SBERDO_2_PSP3 SBERDO_2_PSP4	ETIWND_6_GRPLND	SENTNL_2_CTG1-8 ANAHM_2_CANYN1-4	DSRTSN_2_SOLAR1 DSRTSN_2_SOLAR2 GENESI_2_STG HNTGBH_7_UNIT1 HNTGBH_7_UNIT2	ALAMIT_7_UNIT 1-6 WALCRK_2_CTG1-5	ELSEGN_2_UN1011 ELSEGN_2_UN2021 REDOND_7_UNIT 5,6,8 HINSON_6_LBECH1-4 HARBGN_7_UNITS ARCOGN_2_UNITS
CP#5b	-37	-44	-31	-25	-21	-12

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Effectiveness Factors - All		Distribution Restriction: None

Table 3H (Continued): Lugo-Ranch Vista Generation Effectiveness Factor for one CB out with prior outage of Mira Loma-Mesa

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Buck Blvd / Center	Ormond / Pastoria gen / Big Creek	High Desert / North of Lugo Gen (Solar)	Palomar Energy	SDGE Peaker / Otay Mesa	IV Gen
	Resource IDs → Control Points ↓	BUCKBL_2_PL1X3 CENTER_6_PEAKE	ORMOND_7_UNIT 1 ORMOND_7_UNIT 2 LEBECS_2_UNITS BIGCRK_2_EXESWD	HIDSRT_2_UNITS KRAMER_1_SEGS37 KRAMER_2_SEGS89 SANDLT_2_SUNITS	PALOMR_2_PL1X3	BORDER_6_UNITA1 ESCNDO_6_UNITB1 ELCAJN_6_UNITA1 LARKSP_6_UNIT 1 LARKSP_6_UNIT 2 ESCNDO_6_PL1X2 OTAY_6_PL1X2 MRGT_6_MMAREF MRGT_6_MEF2 OGROVE_6_PL1X2 ELCAJN_6_LM6K OTMESA_2_PL1X2 CARLS1_2_CARCT1 CARLS2_1_CARCT1
CP#5b	-16	9	17	-23	-22	-16

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		Effective Date 12/05/24
Effectiveness Factors - All		Distribution Restriction: None

7580 - Effectiveness Factors – Mira Loma Banks: (version 11.1, 12/13/23)

Table 3C: Switching Effectiveness Factors to Mitigate Overload for 1AA or 2AA Banks

Transmission Line to be Opened	Effectiveness factors represent a percentage decrease (-) or increase (+) in the loading across <u>each</u> of the two Mira Loma AA Banks that are in service (prior to opening)
Mira Loma-Walnut 220 kV line	-24
Mira Loma-Chino #1 220 kV line**	-10
Mira Loma-Chino #2 220 kV line**	-10

**Please be aware that by opening any of the above lines, the flows on the 3AA and 4AA banks will increase. Please conduct a real-time study before implementing the switching.*

***Avoid opening Mira Loma-Chino#1 & #2, when there is only one San Onofre Unit online.*

Note: *The effectiveness percentage is defined as MW flow reduction of each applicable in-service AA bank expressed as percentage of the pre-switching flow of the transmission line switched. Note that these percentages are based on offline Load flow studies for four Mira Loma AA banks in service. Depending on system configuration, these effectiveness percentages may be different in Real-Time.*


Table 3D: Switching Effectiveness Factors to Mitigate Overload for 3AA or 4AA Banks

Transmission Line to be Opened	Effectiveness factors represent a percentage decrease (-) or increase (+) in the loading across each of the two Mira Loma AA Banks that are in service (prior to opening)
Mira Loma-Olinda 220 kV line	-21
Mira Loma-Vista #2 220 kV line	-13
Mira Loma-Chino #3 220 kV line	-20

**Please be aware that by opening any of the above lines the flows on the 1AA and 2AA banks will increase. Please conduct a real-time study before implementing the switching.*

Note: *The effectiveness percentage is defined as MW flow reduction of each applicable in-service AA bank expressed as percentage of the pre-switching flow of the transmission line switched. Note that these percentages are based on offline Load flow studies for four Mira Loma AA banks in service. Depending on system configuration, these effectiveness percentages may be different in Real-Time.*

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Effectiveness Factors - All		Distribution Restriction: None

7590 - Effectiveness Factors for Serrano Banks: (version 12.1, 7/06/23)

Table 2A: Generation Effectiveness Factors for next worst N-1 contingency with Two AA Banks in service

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.									
	Barre	Huntington Beach	Alamitos	Harbor	Long Beach	Center	El Segundo	Walnut Creek	Sentinel Unit	SDG&E
Resource IDs → Control Points ↓	BARRE_6_P EAKER	HNTGBH_2_ PL1X3 HNTGBH_7_ UNIT 2	ALAMIT_2_P L1X3 ALAMIT_7_U NIT 3 ALAMIT_7_U NIT 4 ALAMIT_7_U NIT 5 ALAMIT_7_E S1	HARBGN_7_UNIT 2 HARBGN_7_UNIT 3 HARBGN_7_UNITS	HINSON_6_ LBECH1 HINSON_6_ LBECH2 HINSON_6_ LBECH3 HINSON_6_ LBECH4	CENTER_6 _PEAKER	ELSEGN_2_ UN1011 ELSEGN_2_ UN2021	WALCRK_2_ _CTG1- CTG5	SENTNL_2_ CTG1-CTG8	OTMESA_1_ _PL1X3 PALOMR_2_ _PL1X3 CARLS1_2_ _CARCT1 CARLS2_1_ _CARCT1
Serrano AA Transformers	-27	-27	-22	-17	-17	-16	-15	-9	5	-17

Note 1: For the most effective solution, increasing and decreasing should be done in pairs. Two separate solutions need to be considered, one increase solution and one decrease solution. If this is done, then their Effectiveness Factors can be added together resulting in a more accurate number. It is recommended to try and match the best increase option with the best decrease option for maximum effectiveness.

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Effectiveness Factors - All		Distribution Restriction: None

Table 3A: Generation Effectiveness Factors for next worst N-1 contingency with Three AA Banks in service

		MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.									
		Barre	Huntington Beach	Alamitos	Harbor	Long Beach	Center	El Segundo	Walnut Creek	Sentinel Unit	SDG&E
Resource IDs →	Control Points ↓	BARRE_6_PEAKEER	HNTGBH_2_PL1X3 HNTGBH_7_UNIT 2	ALAMIT_2_PL1X3 ALAMIT_7_UNIT 3 ALAMIT_7_UNIT 4 ALAMIT_7_UNIT 5 ALAMIT_7_ES1	HARBGN_7_UNIT 2 HARBGN_7_UNIT 3 HARBGN_7_UNITS	HINSON_6_LBECH1 HINSON_6_LBECH2 HINSON_6_LBECH3 HINSON_6_LBECH4	CENTER_6_PEAKEER	ELSEGN_2_UN1011 ELSEGN_2_UN2021	WALCRK_2_CTG1-CTG5	SENTNL_2_CTG1-CTG8	OTMESA_1_PL1X3 PALOMR_2_PL1X3 CARLS1_2_CARCT1 CARLS2_1_CARCT1
Serrano AA Transformers		-18	-18	-15	-11	-11	-11	-10	-6	3	-12

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Effectiveness Factors - All		Distribution Restriction: None

7610 - Generator Effectiveness Factors for Mesa 500/230 kV AA Transformer Banks (version 1.0, 5/27/22)

Table 1B: Generator Effectiveness Factors to mitigate overloads on Mesa 500/230 kV AA Banks

Resource IDs →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.							
	Center Peaker	El Segundo Units	Huntington Beach Units	Alamitos Units	Walnut Creek	Arco Gen, Long Beach	Harbor	Barre Peaker
	Control Points ↓	CENTER_6_PEAKEER	ELSEGN_2_UN1011 ELSEGN_2_UN2021	HNTGBH_2_PL1X3 HNTGBH_7_UNIT 2 BARRE_6_PEAKEER	ALAMIT_2_PL1X3 ALAMIT_7_UNIT 3-5 ALAMIT_7_ES1	WALCRK_2_CTG1-CTG5	ARCOGN_2_UNITS HINSON_6_LBECH1-4	HARBGN_7_UNITS
Mesa 500/220 kV AA Banks	-18	-17	-8	-12	-8	-16	-15	-7

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Effectiveness Factors - All		Distribution Restriction: None	

7630 - Effectiveness Factors for Orange County Area: (version 17.0, 6/01/24)

Table 3A: Effectiveness Factors

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.							
	Barre Peaker	Huntington Beach Units	Alamitos	Harbor Gen, Long Beach	Center Peaker	El Segundo Units	Walnut Creek Energy Center	Mountain View, Etiwanda, Mira Loma Peaker
Resource IDs → Transmission Line ↓	BARRE_6_PEAKEER	HNTGBH_2_PL1X3 HNTGBH_7_UNIT 2	ALAMIT_2_PL1X3 ALAMIT_7_UNIT 3-5 ALAMIT_7_ES1	HARBGN_7_UNITS, HINSON_6_LBECH1 thru 4	CENTER_6_PEAKEER	ELSEGN_UN1011 ELSEGN_UN2021	WALCRK_2_C TG1 WALCRK_2_C TG2 WALCRK_2_C TG3 WALCRK_2_C TG4 WALCRK_2_C TG5	SBERDO_2_P SP3 and 4, MIRLOM_6_PEAKEER
Barre-Lewis 220 kV line	-30	-26	-22	-9	-17	-13	-5	2
Barre-Villa Park 230 kV Line	-17	-19	-14	-9	-13	-9	-3	2

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Effectiveness Factors - All		Distribution Restriction: None

Table 3B: Minimum Online Commitment (MOC) Relative Effectiveness Factors

Resource IDs →	Generation units to be used for thermal constraints			
	Huntington Beach Units	Alamitos Units	Harbor Gen	El Segundo Units
	HNTGBH_2_PL1X3 HNTGBH_7_UNIT 2	ALAMIT_2_PL1X3 ALAMIT_7_UNIT 3 - 5 ALAMIT_7_ES1	HARBGN_7_UNITS	ELSEGN_UN1011 ELSEGN_UN2021
MOC	1.00	.85	.48	.50

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Effectiveness Factors - All		Distribution Restriction: None

7640 - Effectiveness Factors for LA Basin Area N-1-1: (version 1.0, effective 6/01/24)

Table 3: LA Basin Generator Effectiveness Factors

Resource IDs → Control Points ↓	MW decrease in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.					
	El Segundo Energy Center	Chevron USA Units	Watson Cogeneration	Long Beach Unit/Southeast Resource Recovery	Huntington Beach Energy/Huntington Gen STA	Alamitos Gen STA/Alamitos Energy Center/Alamitos Energy Storage
	ELSEGN_2_UN1011 ELSEGN_2_UN2021	CHEVMN_2_UNITS	ARCOGN_2_UNITS	HINSON_6_LBECH1 HINSON_6_LBECH2 HINSON_6_LBECH3 HINSON_6_LBECH4	HNTGBH_7_UNIT2 HNTGBH_2_PL1X3	ALAMIT_7_UNIT 3 ALAMIT_7_UNIT 4 ALAMIT_7_UNIT 5 ALAMIT_2_PL1X3 ALAMIT_7_ES1
CP#1 CP#2 CP#3 CP#4	0.28	0.28	0.26	0.26	0.14	0.16

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Effectiveness Factors - All		Distribution Restriction: None

7680 - Effectiveness Factors for Sylmar: (version 3.2, 1/04/24)

Table 5A: Sylmar-Pardee #1 Generation Effectiveness Factors for Sylmar-Pardee #2 contingency (Flows from LADWP to SCE)

MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.										
	PDCI (Circulation) /PDCI (Schedule Cut)	Berry Cogen 42	Ormand	Pastoria/ Elwood/ Oxgen/Procter/ Williamette	Big Creek/ Eastwood	El Segundo/Hinson/ Alamitos/Huntington Beach/Desert Sunlight/Genesis/ Sentinel	PGAE Unit	Ivanpah	SDGE Unit	High Desert/ Hoover/Four Corners/ Etiwanda/ Mountainview
Resource IDs → Control Points ↓	PDCI (Circulation South to North)/PDCI (Schedule Cut)	TENGEN_2_PL1X2	ORMON D_7_UNIT 1 ORMON D_7_UNIT 2	LEBECS_2_UNITS GOLETA_6_ELLW ODSNCLRA_6_O XGEN SNCLRA_6_PRO CGN SNCLRA_6_WILL MT	BIGCRK_2_EXESWD EASTWD_7_UNIT	ELSEGN_2_UN1011 ELS EGN_2_UN2021 HINSON_6_LBECH1 thru 4 ALAMIT_2_PL1X3 ALAMIT_7_UNIT 3 - 5 ALAMIT_7_ES1 HNTGBH_2_PL1X3 HNTGBH_7_UNIT2 DSRTSN_2_SOLAR1 &2 GENESI_2_STG SENTNL_2_CTG1 - 8	Multiple	IVANPA_1_UNIT1 thru 3	Multiple	HIDSRT_2_UNITS SCEHOV_2_HOOVER SBERDO_2_PSP3 & PSP4
CP#1 CP#2 CP#3	-18/-12	-51	-48	-42	-35	6	-3	7	6	5

Notes: The effectiveness factors are based on a steady-state condition, and may differ under real-time conditions.

*When the flows are from SCE to LADWP, the table on previous page (Table 5A) has the reverse effectiveness.

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Effectiveness Factors - All		Distribution Restriction: None

Table 5B: Sylmar-Pardee #1/#2 Generation Effectiveness Factors for Lugo-Victorville contingency (Flows from LADWP to SCE)

MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.										
	PDCI (Circulation)/PDCI (Schedule Cut)	Berry Cogen 42	Ormand	Pastoria/Elwood/Oxgen/Procter/Williamette	Big Creek/Eastwood	El Segundo/Hinson/Alamitos/Huntington Beach/Desert Sunlight/Genesis/Sentinel	PGAE Unit	Ivanpah	SDGE Unit	High Desert/Hoover/Four Corners/Eiwanda/Mountainview
Resource IDs → Control Points ↓	PDCI (Circulation South to North)/PDCI (Schedule Cut)	TENGEN_2_PL1X2	ORMOND_7 - UNIT 1 ORMOND_7 - UNIT 2	LEBECs_2_UNITS GOLETA_6_ELLWOD SNCLRA_6_OXGEN SNCLRA_6_PROCGN SNCLRA_6_WILLMT	BIGCRK_2_EXESWD EASTWD_7_UNIT	ELSEGN_2_UN1011EL SEGN_2_UN2021 HINSON_6_LBECH1 thru 4 ALAMIT_2_PL1X3 ALAMIT_7_UNIT 3 - 5 ALAMIT_7_ES1 HNTGBH_2_PL1X3 HNTGBH_7_UNIT2 DSRTSN_2_SOLAR1 &2 GENESI_2_STG SENTNL_2_CTG1 thru 8	Multiple	IVANPA_1_UNIT1 thru 3	Multiple	
CP#4 CP#5	-20/-19	-48	-46	-41	-35	5	-3	10	6	3

Notes: The effectiveness factors are based on a steady-state condition, and may differ under real-time conditions.
 *For the control points #4 and #5 in Table 5B, on previous page, has the reverse effectiveness.

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Effectiveness Factors - All		Distribution Restriction: None

Table 6: Transmission Facility Effectiveness Factors with All Lines in Service (Flows from LADWP to SCE) (4)

Transmission Facilities	CAISO: Moorpark-Sylmar de-loop at Pardee	LADWP: Adelanto-Rinaldi 500 kV line	LADWP: Victorville-Rinaldi 500 kV line
Sylmar AC	Varies (1)	16 (2,3)	17 (2,3)

- Notes:** 1) The effectiveness factors for de-looping Moorpark-Sylmar line at Pardee: this de-loop at the Pardee 220 kV substation creates a Sylmar #1 to Moorpark #3 220 kV line and a Sylmar #2 to Moorpark #2 220 kV line, the effectiveness factors vary with system conditions. The mitigation is therefore not a preferred option. If there is a need to implement this, conduct a study using Network Applications to verify this mitigation will be effective prior to implementation.
- 2) Do not open any of these 500 kV line if the 287 kV lines (Victorville-Century #1 and #2, Victorville-Mead) or Victorville Substation Bank K are out of service.
- 3) Opening any of these 500 kV line will result in a SCIT de-rate. Refer to CAISO Operating Procedure [6510 SCIT](#).
- 4) This mitigation is only valid for flows from LADWP to SCE.

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Effectiveness Factors - All		Distribution Restriction: None

7690 - Effectiveness Factors for North of Lugo N-1-1: (version 4.5, 11/01/24)

Table 3A: Inyokern-Control Area Import Condition Generation Effectiveness Factors

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Coso Navy 1	Argus Cogeneration	Oxbow Geothermal	Mammoth G	Lundy, Poole Hydro, Control QFS, Rush Creek, and Bishop Creek
	CALGEN_1_UNITS	SEARLS_7_ARGUS	CONTRL_1_OXBOW	CONTRL_1_CASA D1, CONTRL_1_CASA D3	CONTRL_1_LUNDY, CONTRL_1_POOLE, CONTRL_1_QF, CONTRL_1_RUSHCK, BISHOP_1_ALA MO, BISHOP_1_UNITS
CP#1	-100	-100	-100	-100	-100

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Effectiveness Factors - All		Distribution Restriction: None

Table 3B: Inyokern-Control Area Export Condition Generation Effectiveness Factors

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Coso Navy 1	Argus Cogeneration	Oxbow Geothermal	Mammoth G	Lundy, Poole Hydro, Control QFS, Rush Creek, and Bishop Creek
	CALGEN_1_UNITS	SEARLS_7_ARGUS	CONTRL_1_OXBOW	CONTRL_1_CASA D1, CONTRL_1_CASA D3	CONTRL_1_LUNDY, CONTRL_1_POOLE, CONTRL_1_QF, CONTRL_1_RUSHCK, BISHOP_1_ALA MO, BISHOP_1_UNITS
CP#2	100	100	100	100	100

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Effectiveness Factors - All		Distribution Restriction: None	

Table 3C: Inyokern-Control Area Import Condition Generation Effectiveness Factors

Resource IDs Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Oxbow Geothermal	Mammoth G	Lundy, Poole Hydro	Control QFS, Rush Creek	Bishop Creek
	CONTRL_1_OXBOW	CONTRL_1_CASA D1, CONTRL_1_CASA D3	CONTRL_1_LUNDY, CONTRL_1_POOLE	CONTRL_1_QF, CONTRL_1_RUSHCK	BISHOP_1_ALA MO, BISHOP_1_UNITS
CP#3	-100	-100	-100	-100	-100

Table 3D: Inyokern-Control Area Import Condition Generation Effectiveness Factors

Resource IDs Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Oxbow Geothermal	Mammoth G	Lundy, Poole Hydro	Control QFS, Rush Creek	Bishop Creek
	CONTRL_1_OXBOW	CONTRL_1_CASA D1, CONTRL_1_CASA D3	CONTRL_1_LUNDY, CONTRL_1_POOLE	CONTRL_1_QF, CONTRL_1_RUSHCK	BISHOP_1_ALA MO, BISHOP_1_UNITS
CP#4	100	100	100	100	100

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Effectiveness Factors - All		Distribution Restriction: None

Table 3E: Control-Hariwee-Inyoken Thermal Condition Generation Effectiveness Factors

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Coso Naby 1	Augus Cogeneration Trona Solar III	Bishop Creek Plan 3 and 4, Bishop Creek Plan 2 and 6, Dixie Valley Geo, Contrl QFS	Casa Diablo 4 Mammoth G1, G2, G3	Rush Creek Lundy Poole Hydro Plant 1
Resource IDs → Control Points ↓	CALGEN_1_UNITS	SEARLS_7_ARGUS, SEARLS_1_TS3SR1	BISHOP_1_UNITS, BISHOP_1_ALAMO, CONTRL_1_OXBOW, CONTRL_1_QF	CASADB_1_CD4GT1, CONTRL_1_CASAD1, CONTRL_1_CASAD2, CONTRL_1_CASAD3,	CONTRL_1_RUSHCK, CONTRL_1_LUNDY, CONTRL_1_POOLE
CP#5	-9	-7	22	20	18

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Effectiveness Factors - All		Distribution Restriction: None

Table 3F: Roadway-Victor Thermal Condition Generation Effectiveness Factors

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Baldy Mesa	Resurgence	Alba, Ocaso, BLM, LSP	Daggett	Coso Navy 1	High Desert
Resource IDs → Control Points ↓	HAMLIN_1_BLDSB1	KRAMER_1_R1BX3, KRAMER_1_R1PX3, KRAMER_1_R2BX2, KRAMER_1_R2PX2	SANDLT_2_SUNITS, BLM W_2_COSBT1, BLM_2_UNITS, NAVYII_2_UNITS, LCKTH1_2_LH1SR1, LCKTH1_2_LH1SR2, KRAMER_2_SEGS 9	CMBLND_2_DS2BT1, CMBLND_2_DS2BT2, CMBLND_2_DS2BT3, CMBLND_2_DS2SR1, CMBLND_2_DS2SR2, CMBLND_2_DS2SR3, SISPRG_2_DS3BT1, SISPRG_2_DS3BT2, SISPRG_2_DS3BT3, SISPRG_2_DS3BT4, SISPRG_2_DS3SR1, SISPRG_2_DS3SR2, SISPRG_2_DS3SR3, SISPRG_2_DS3SR4	CALGEN_1_UNITS	HIDSRT_2_UNITS
CP#6	80	11	7	7	11	-4

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Effectiveness Factors - All		Distribution Restriction: None

Table 3G: Kramer-Victor #1 Thermal Condition Generation Effectiveness Factors

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Baldy Mesa	Resurgence	Alba, Ocaso, BLM, LSP	Daggett	Coso Navy 1	High Desert
Resource IDs → Control Points ↓	HAMLIN_1_BLDSB1	KRAMER_1_R1BX3, KRAMER_1_R1PX3, KRAMER_1_R2BX2, KRAMER_1_R2PX2	SANDLT_2_SUNITS, BLM W_2_COSBT1, BLM_2_UNITS, NAVYII_2_UNITS, LCKTH1_2_LH1SR1, LCKTH1_2_LH1SR2, KRAMER_2_SEGS 9	CMBLND_2_DS2BT1, CMBLND_2_DS2BT2, CMBLND_2_DS2BT3, CMBLND_2_DS2SR1, CMBLND_2_DS2SR2, CMBLND_2_DS2SR3, SISPRG_2_DS3BT1, SISPRG_2_DS3BT2, SISPRG_2_DS3BT3, SISPRG_2_DS3BT4, SISPRG_2_DS3SR1, SISPRG_2_DS3SR2, SISPRG_2_DS3SR3, SISPRG_2_DS3SR4	CALGEN_1_UNITS	HIDSRT_2_UNITS
CP#7	9	31	39	38	26	-4

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Effectiveness Factors - All		Distribution Restriction: None

7720 - Effectiveness Factors Julian Hinds-Mirage: (version 6.1, 8/17/23)

Table 4: Generation Effectiveness Factors - None

Control Points↓ Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.
	Buck Blvd.
	BUCKBL_2_PLIX3
<u>Combined Loading #1</u>	-67
<u>Combined Loading #2</u>	-100

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Effectiveness Factors - All		Distribution Restriction: None	


7740 - Effectiveness Factors for Parker - Gene: (version 5.1, 3/30/23)

Table 3: (Utilizing WALC decremental Generation from outside of the CAISO Balancing Area)

Control Points↓ Resource IDs →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation. (i.e. mitigation requires a decrease in WALC area Generation, and an increase in CAISO Generation)*			
	Southpoint	Parker	Davis	Griffith
	Control Points↓	Not a Market Participant	Not a Market Participant	Not a Market Participant
Parker – Gene 230 kV Line	15	15	10	7

* A Schedule adjustment must accompany any decremental Generation.

All of these Generators are WALC Generation facilities and the Generators do not have CAISO Participating Generator Agreements. These effectiveness factors are therefore not found in the IFM/RTN, with the exception of Griffith, which is a pseudo tie and is a Market Participant in the WALC BA Area.


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Effectiveness Factors - All		Distribution Restriction: None	

7760 - Effectiveness Factors for Devers-Red Bluff Lines: (version 2.1, 10/14/24)

Table 1D: Devers Area Generation Effectiveness

Resource Locations →	MW increase in the calculated loading across the transmission facilities that make up the control point for a 100 MW increase in Generation.			
	Red Bluff	Colorado River	Devers	Valley
Control Points ↓				
Devers-Red Bluff 500 kV Lines	56	47	-15	-14

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Effectiveness Factors - All		Distribution Restriction: None

7820 - Effectiveness Factors for San Diego Area: (version 19.4, 11/26/24)

Table 3A: SDGE/CFE import & SDGE import Generation Effectiveness Factors

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.		
	Palomar Energy	Otay Mesa	SDGE Peakers
	Resource IDs → Control Points ↓	PALOMR_2_PL1X3	OTMESA_2_PL1X2
SDGE/CFE Import	-100	-100	-100

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Effectiveness Factors - All		Distribution Restriction: None

Table 3B: TL6913 Generation Effectiveness Factors – CP# 4a of 7820 Table 1A

Resource IDs → Control Points ↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Palomar Energy	Otay Mesa	Pio Pico	SDGE Peakers	IV gen
	PALOMR_2_PL1X3	OTMESA_2_PL1X2	PIOPIC_2_CTG2 PIOPIC_2_CTG3 PIOPIC_2_CTG1	ESCNDO_6_PL1X2 ESCO_6_GLMQF	TERMEX_2_PL1X3 LAROA1_2_UNITA1 LAROA2_2_UNITA1 CSLR4S_2_SOLAR IVSLRP_2_SOLAR1 CNTNLA_2_SOLAR1 CPVERD_2_SOLAR
TL6913	-5	2	2	-11	2

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Effectiveness Factors - All		Distribution Restriction: None

Table 3C: TL6913 Generation Effectiveness Factors – CP# 4b of 7820 Table 1A

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Palomar Energy	Otay Mesa	Pio Pico	SDGE Peakers	IV gen
Resource IDs → Control Points ↓	PALOMR_2_PL1X3	OTMESA_2_PL1X2	PIOPIC_2_CTG2 PIOPIC_2_CTG3 PIOPIC_2_CTG1	ESCNDO_6_PL1X2 ESCO_6_GLMQF	TERMEX_2_PL1X3 LAROA1_2_UNITA1 LAROA2_2_UNITA1 CSLR4S_2_SOLAR IVSLRP_2_SOLAR1 CNTNLA_2_SOLAR1 CPVERD_2_SOLAR
TL6913	-14	2	2	-17	2

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Effectiveness Factors - All		Distribution Restriction: None

Table 3D: TL23040 Generation Effectiveness Factors

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.					
	Palomar Energy	Otay Mesa	Pio Pico	SDGE Peakers	IV Gen	IV PST
Resource IDs →	PALOMR_2_PL1X3	OTMESA_2_PL1X2	PIOPIC_2_CTG2 PIOPIC_2_CTG3 PIOPIC_2_CTG1	BORDER_6_UNITA1 ESCNDO_6_UNITB1 ELCAJN_6_UNITA1 LARKSP_6_UNIT 1 LARKSP_6_UNIT 2 MRGT_6_MMAREF MRGT_6_MEF2 ELCAJN_6_LM6K CARLS1_2_CARCT1 CARLS2_1_CARCT1	TERMEX_2_PL1X3 LAROA1_2_UNITA1 LAROA2_2_UNITA1 CSLR4S_2_SOLAR IVSLRP_2_SOLAR1 CNTNLA_2_SOLAR1 CPVERD_2_SOLAR	22357_IV PFC1 _230_22358_IV PFC _230_PS_1 or 22357_IV PFC1 _230_22358_IV PFC _230_PS_2
Control Points ↓						
TL23040	-7	-17	-17	-10	12	96

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Effectiveness Factors - All		Distribution Restriction: None

Table 3E: Relative effectiveness of Schedule changes on S Line (Imperial Valley - El Centro (IID)) 230 kV direction.¹

Resource ↓ Flow →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.	
	SCE Area Generation (Mountain View, Blythe Energy Center)²	PGAE Area Generation (Delta)³
IV Generation	-13	-12
SDGE Generation	-8	-8

Note¹: These incremental and decremental dispatches should be exercised in pairs for maximum effectiveness.

Note²: This calculation is based on increase of IV generation and decrease of SCE Area generation (Mountain View, Blythe Energy Center)

Note³: This calculation is based on the increase of IV generation and decrease of PGAE Area generation (Delta)


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Table 3F: South of San Onofre Generation Effectiveness Factors

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Palomar Energy	Otay Mesa	Pio Pico	SDGE Peakers	IV gen
Resource IDs →	PALOMR_2_PL1X3	OTMESA_2_PL1X2	PIOPIC_2_CTG2 PIOPIC_2_CTG3 PIOPIC_2_CTG1	BORDER_6_UNITA1 ESCNDO_6_UNITB1 ELCAJN_6_UNITA1 LARKSP_6_UNIT 1 LARKSP_6_UNIT 2 ESCNDO_6_PL1X2 OTAY_6_PL1X2 MRGT_6_MMAREF MRGT_6_MEF2 OGROVE_6_PL1X2 ELCAJN_6_LM6K CARLS1_2_CARCT1 CARLS2_1_CARCT1	TERMEX_2_PL1X3 LAROA1_2_UNITA1 LAROA2_2_UNITA1 CSLR4S_2_SOLAR IVSLRP_2_SOLAR1 CNTNLA_2_SOLAR1 CPVERD_2_SOLAR
Control Points ↓					
South of San Onofre	-88	-83	-83	-90	-75

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Effectiveness Factors - All		Distribution Restriction: None	

Table 3G: 631 (El Cajon - Los Coches) 69 kV Generation Effectiveness Factors

Control Points↓	Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.
	SDGE Peakers	
	ELCAJN_6_UNITA1 ELCAJN_6_LM6K	
(TL 631) El Cajon – Los Coches 69 kV		-22

Table 3H: Suncrest 500/230 kV Bank 80 or 81 Generation Effectiveness Factors for TL50001 out of service and Suncrest 500/230 kV Bank 80 or 81 Contingency

Control Points↓	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Otay Mesa	Pio Pico	El Cajon	IV generation	IV PST
	Resource IDs →	OTAYMGT1 OTAYMGT2 OTAYMST1	PIO PICO CT1 PIO PICO CT2 PIO PICO CT 3	EC GEN1 EC GEN2	OCO GEN G1 OCO GEN G2 ECO GEN1 G1 IV GEN1 STG IV GEN1 CTG2
Suncrest 500/230 kV Bank 80 or 81	-27	-27	-26	30	-40 ¹

Note¹: Increasing flow from IV to La Roa

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Effectiveness Factors - All		Distribution Restriction: None

Table 3I: Combined loading of Miguel Banks Generation Effectiveness Factors for IV-SX connection out of service

Control Points↓ Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.	
	IV Generation	Export to CENACE
		TERMEX_2_PL1X3 LAROA1_2_UNITA1 LAROA2_2_UNITA1 CSLR4S_2_SOLAR IVSLRP_2_SOLAR1 CNTNLA_2_SOLAR1 CPVERD_2_SOLAR
Combined Loading of Miguel 500/230 kV Banks 80 & 81	28	-27

Table 3J: Relative effectiveness of Generating Units on relieving congestion on SWPL¹ (includes TL50002 only)

Control Points↓ Resource →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.		
	SDG&E Generation (Studied at Palomar)	SCE Generation (Studied at Pastoria)	PGAE Generation (Studied at Delta)
SWPL (Includes TL50002 only)	-43	-14	-13

Note¹: Effectiveness factors were studied with a corresponding decrease in Palo Verde Generation.

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Effectiveness Factors - All		Distribution Restriction: None

Table 3K: TL13810 Generation Effectiveness Factors

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.				
	Palomar Energy	Otay Mesa	Pio Pico	SDGE Peakers	IV gen
Resource IDs → Control Points ↓	PALOMR_2_PL1X3	OTMESA_2_PL1X2	PIOPIC_2_CTG2 PIOPIC_2_CTG3 PIOPIC_2_CTG1	MRGT_6_MMAREF MRGT_6_MEF2 CARLS1_2_CARCT1 CARLS2_1_CARCT1	TERMEX_2_PL1X3 LAROA1_2_UNITA1 LAROA2_2_UNITA1
TL13810	-7	5	5	-7	3

Table 3L: TL23054 (Sycamore Canyon - Suncrest) 230 kV Generation Effectiveness Factors for TL50001 out of service

	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.			
	Otay Mesa	Pio Pico	IV generation	IV PST
Resource IDs → Control Points ↓	OTAYMGT1 OTAYMGT2 OTAYMST1	PIO PICO CT1 PIO PICO CT2 PIO PICO CT 3	OCO GEN G1 OCO GEN G2 ECO GEN1 G1 IV GEN1 STG IV GEN1 CTG2	22357_IV PFC1 _230_22358_IV PFC _230_PS_1 or 22357_IV PFC1 _230_22358_IV PFC _230_PS_2
(TL23054) Suncrest – Sycamore #1 230 kV	-7	-7	9	-30

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Effectiveness Factors - All		Distribution Restriction: None


Table 3M: Sycamore Canyon Bk60 Generation Effectiveness Factors for TL50001 out of service

Control Points↓ Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.		
	El Cajon	IV generation	IV PST
	EC GEN1 EC GEN2	OCO GEN G1 OCO GEN G2 ECO GEN1 G1 IV GEN1 STG IV GEN1 CTG2	22357_IV PFC1 _230_22358_IV PFC _230_PS_1 or 22357_IV PFC1 _230_22358_IV PFC _230_PS_2
Sycamore Canyon BK60	-10	6	-3

Table 3N: IV PST2 Generation Effectiveness Factors for loss of IV PST1

Control Points↓ Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.
	IV PST
IV PST2	100

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Effectiveness Factors - All		Distribution Restriction: None

7910 - Effectiveness Factors for Valley Electric Association (VEA): (version 6.1, 12/19/22)

Table 3: VEA CP #2 Generation Effectiveness Factors

Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.	
	Sunshine Valley Solar 1	Community Solar
Control Points↓	SUNSLR_1_SSVSR1	VEAVST_1_SOLAR
CP#2	80%	78%

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Effectiveness Factors - All		Distribution Restriction: None

8610 - Effectiveness Factors for Sylmar Transformer Banks (Path 41): (version 5.0, 6/01/23)

Table 3A: Generation Effectiveness Factors – Flow Limits

Resource IDs →	MW increase in the <u>calculated loading</u> across the transmission facilities that make up the <u>control point</u> for a 100 MW increase in Generation.								
	Hoover	1-4 /High Desert	Etiwanda/ Mountainview/Mira Loma Peaker/ Grapeland Peaker	SDG&E: Any Units	Ormond	Pastoria/ Omar / Sycamore	Big Creek	Ventura	Vestal
	Control Points↓	HOOVER_2_SCEPT	HIDSRT_2_UNITS	ETIWND_2_UNIT1 ETIWND_6_GRPLND MIRLOM_6_PEAKE SBERDO_2_PSP3 SBERDO_2_PSP4	Refer to 7820 PI Gen list	ORMOND_7_UNIT 1 ORMOND_7_UNIT 2	LEBECS_2_UNITS OMAR_2_UNITS SYCAMR_2_UNITS	BIGCRK_2_EXESWD	GOLETA_2_VALBT1 GOLETA_6_EXGEN GOLETA_6_ELLWOD SNCLRA_2_SPRHYD SNCLRA_2_HOWLNG SNCLRA_2_UNIT SNCLRA_2_UNIT1 SNCLRA_2_SILBT1 SNCLRA_2_VESBT1 SNCLRA_6_OXGEN MNDALY_6_MCGRTH
Path 41	9	7	4	2	-36	-27	-26	-34	-27

General Notes: This table indicates the degree of effectiveness that Generation will be at relieving the calculated loading across the multiple transmission facilities that make up the control point.

Monitor the loading on South of Lugo because the mitigation for the Sylmar Banks could increase the South of Lugo flow if Generation at Etiwanda, Mountainview, Mira Loma Peaker, or Grapeland Peaker is decreased. Monitor the loading on the Victorville-Lugo 500 kV line. Depending upon the flow on this line, increasing Generation at Ormond, Pastoria, or Big Creek may exacerbate the loading.

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Table 3B: Effectiveness of Switching Lines

Transmission Facilities ^{1,7}	CAISO: Eagle Rock - Sylmar 220 kV line	CAISO: Pardee – Sylmar #1 or #2 220 kV lines	CAISO: Moorpark – Sylmar de-loop at Pardee	LADWP: Adelanto - Rinaldi 500 kV line	LADWP: Victorville - Rinaldi 500 kV line	LADWP: Adelanto - Toluca 500 kV line
Path 41	32 ⁵	24 ⁵	Varies ^{4,6}	38 ^{2,3}	38 ^{2,3}	33 ^{2,3}

Notes:

1. It is not recommended to open more than one line (combined) in LADWP & CAISO BA Areas. Consult Operations Engineering if more than one transmission line needs to be opened.
2. Do not open any of these 500 kV lines if the 287 kV lines or Victorville Substation Bank K are out of service.
3. Opening any of these 500 kV lines will result in a SCIT de-rate. **Refer** to CAISO Operating Procedure [6510 SCIT](#)
4. The effectiveness for de-looping Moorpark-Sylmar line at Pardee varies with system conditions. This Mitigation is therefore not a preferred option. If there is a need to implement this, conduct a study using Advanced Network Applications to verify if this mitigation will be effective prior to implementing this.
5. Opening these 220 kV lines is only effective when the flows on these lines are leaving Sylmar.
6. This de-loop at Pardee 220 kV substation creates a Sylmar #1 to Moorpark #3 220 kV line and a Sylmar #2 to Moorpark #2 220 kV line. This transmission line switching can be performed in combination with the opening of the Eagle Rock – Sylmar 220 kV line. Please note that implementing only the de-looping at Pardee for Pardee-Sylmar #1 & #2 lines is not considered as opening the lines.
7. Taking these lines out of service reduces loading on the Sylmar transformer banks.

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2. Supporting Information

Operationally Affected Parties

Shared with the Public.


References & Definitions

None.

Version History


Version	Change	Date
27.4	<ul style="list-style-type: none"> 6310: Relabeled Table 3 (Parts 1 & 2) and added Control Point numbers; Table 3, Part 1: Added CP#11, Dos Amigos Pumping Plant - Panoche 230; added CP #12, LBN path flow (S->N); added CP #13 & 14, Path 15 flow (S->N). Table 3, Part 2: Added CP#11, Dos Amigos Pumping Plant - Panoche 230; added CP #12, LBN path flow (S->N); added CP #13 & 14, Path 15 flow (S->N). Updated to version 22.3, effective 11/01/19. Updated version and dates only for the following: <ul style="list-style-type: none"> 6110: version 9.0, effective 11/01/19 6140: version 6.4, effective 11/01/19 6610: version 12.9, effective 10/02/19 7820: version 15.16, effective 11/01/19 	11/21/19
27.5	<ul style="list-style-type: none"> Updated version and dates only for the following: <ul style="list-style-type: none"> 6310: version 22.4, effective 12/06/19 6610: version 13.0, effective 12/17/19 7430: version 23.6, effective 11/21/19 Added new 7910 - Effectiveness Factors for Valley Electric Association (VEA): Table 3 –VEA CP #2 Generation Effectiveness Factors, version 5.0, effective 12/17/19. 	12/17/19
27.6	<ul style="list-style-type: none"> 7410: Updated Tables 3A-1 & 3B-1, updated to version 8.1, effective 4/30/20. Updated version and dates only for the following: <ul style="list-style-type: none"> 6110: version 9.1, effective 4/02/20 6310: version 22.5, effective 4/01/20 6610: version 13.1, effective 4/02/20 7230: version 11.9, effective 1/10/20 7430: corrected to version 24.0 7440: version 2.0, effective 2/05/20 7450: version 2.0, effective 4/23/20 7630: version 15.0, effective 1/30/20 	5/07/20

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	<ul style="list-style-type: none"> ○ 7740: version 5.0, effective 3/20/20 ○ 7820: version 15.17, effective 12/19/19 ○ 7910: version 5.1, effective 3/26/20 ○ 8610: version 4.0, effective 2/05/20 	
Version	Change	Date
27.7	<ul style="list-style-type: none"> • 6610 (Table 3B), 7550 (Tables 3A & 3B), 7570 (Tables 1A – 1D), 7580 (Tables 3A & 3B), 7590 (Tables 2A & 3A), 7630 (Tables 3A & 3B), 7680 (Tables 5A & 5B) – <ul style="list-style-type: none"> ○ Removed REDOND_7_UNIT 7 due to retirement. • 7430, Tables 3A & 3B, CP#17: Corrected typo. • 7580, Table 3A: Removed CHINO_6_SMPPAP due to retirement. • Updated version and date for the following procedures: <ul style="list-style-type: none"> ○ 6110: Version 10.2, effective 2/04/21 ○ 6140A: Version 2.0, effective 1/08/21 ○ 6310: Version 23.0, effective 6/01/20 ○ 6610: Version 14.0, effective 11/01/20 ○ 7110: Version 13.0, effective 10/22/20 ○ 7120: Version 9.0, effective 6/04/20 ○ 7230: Version 12.1, effective 1/29/21 ○ 7240: Version 13.0, effective 7/20/20 ○ 7320: Version 24.0, effective 1/28/21 ○ 7330: Version 12.0, effective 12/04/20 ○ 7340: Version 3.0, effective 12/04/20 ○ 7420: Version 6.0, effective 11/05/20 ○ 7430: Version 24.2, effective 9/25/20 ○ 7440: Version 2.3, effective 2/19/21 ○ 7450: Version 2.1, effective 11/05/20 ○ 7500: Version 2.0, effective 6/26/20 ○ 7510: Version 6.0, effective 11/19/20 ○ 7540: Version 2.0, effective 8/12/20 ○ 7550: Version 8.0, effective 11/19/20 ○ 7570: Version 12.0, effective 8/20/20 ○ 7580: Version 10.0, effective 11/19/20 ○ 7590: Version 12.0, effective 7/24/20 ○ 7630: Version 15.2, effective 12/10/20 ○ 7680: Version 3.1, effective 12/04/20 ○ 7820: Version 16.3, effective 2/03/21 ○ 7910: Version 5.3, effective 6/26/20 • Version History: Corrected typo (Version 25.6). • Replaced instances of ISO with CAISO. 	2/19/21

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27.8	<ul style="list-style-type: none"> • 6310: Updated to Table 4 and updated to version 23.1, effective 4/01/21. • Added 6410 Table 2 and version 9.2, effective 4/22/21. • 7320, Table C: Added Dallas Energy Storage and Black Diamond Energy Storage. • 7430, Table 3A/3B: Removed reference of Mendota Biomass/Coalinga Cogen. • Added 7430 Table 3C. • 7440, Table 3: Updated Effectiveness Factors. • Updated version and date for the following procedures: <ul style="list-style-type: none"> ○ 6110: Updated to version 10.3, effective 4/01/21. ○ 6140: Updated to version 7.0, effective 4/07/21. ○ 7120: Updated to version 9.1, effective 4/07/21. ○ 7450: Updated to version 2.2, effective 4/01/21. ○ 7820: Updated to version 16.4, effective 4/20/21. 	4/22/21
27.9	<p>Updated 6610, Table 4: added right column header and updated to version 14.1, effective 4/15/21.</p> <p>Removed 7750 Tables, as procedure retired 5/06/21.</p> <p>Updated version and date for the following procedures:</p> <ul style="list-style-type: none"> • 6110: Updated to version 10.4, effective 5/13/21. • 6140A: Updated to version 2.1, effective 5/13/21. • 6410: Updated to version 9.3, effective 5/20/21. • 7120: Updated to version 9.3, effective 6/22/21. • 7230: Updated to version 13.1, effective 6/22/21. • 7320: Updated to version 24.1, effective 7/01/21. • 7430: Updated to version 24.3, effective 6/11/21. • 7440: Updated to version 2.4, effective 6/24/21. • 7450: Updated to version 2.4, effective 6/22/21. • 7570: Updated to version 12.1, effective 6/10/21. • 7690: Updated to version 2.0, effective 6/03/21. • 7820: Updated to version 17.0, effective 6/01/21. • 7910: Updated to version 5.4, effective 7/01/21. 	7/01/21
28.0	<ul style="list-style-type: none"> • Updated 6110, Table 5A: Removed GRNLF1_1_UNITS; updated to version 11.0, effective 9/01/21. • Updated 6610, Tables 3A thru 3D: removed INLDEM_5_UNIT 1 & 2; Tables 3B & C - Removed HNTGBH_7_UNIT1, 3 & 4; added HNTGBH_2_PL1X3; Removed ALAMIT_7_UNIT 1, 2 & 6; added ALAMIT_2_PL1X3 and ALAMIT_7_ES1; Table 3B: added ETIWND_2_UNIT1, and updated to version 15.0, effective 8/05/21. • Updated 7230, Table 3: Removed GRNLF_1_UNITS. • Updated 7440, Table 3: Added VISTRA_5_DALBT3 for CP2 mitigation. • Updated 7500, Table 3: removed PANDOL_6_UNIT. 	10/21/21

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	<ul style="list-style-type: none"> • Updated 7540, Table 4: removed HOLTGAT_1_MOGEN. • Updated 7550, Tables 3A & 3B: Removed HNTGBH_&_UNIT1, added HNTGBH_2_PL1X3; Removed ALAMIT_7_UNIT 1, 2 & 6, added ALAMIT_2_PL1X3 & ALAMIT_7_ES1; Removed INLDEM_5_UNIT 1 & 2. • Updated 7570, Table 1A, 1C & 1D: removed INLDEM_5_UNIT 1 & 2; removed HNTGBH_7_UNIT 1 and added HNTGBH_2_PL1X3; Removed ALAMIT_7_UNIT 1, 2 & 6 and added ALAMIT_7_ES1 & ALAMIT_2_PL1X3. Table 1B: removed INLDEM_5_UNIT 1 & 2; HNTGBH_7_UNIT 1 and added HNTGBH_2_PL1X3. • Updated 7580, Table 3A & 3B: removed INLDEM_5_UNIT 1 & 2; removed HNTGBH_7_UNIT 1 and added HNTGBH_2_PL1X3; Removed ALAMIT_7_UNIT 1, 2 & 6 and added ALAMIT_7_ES1 & ALAMIT_2_PL1X3. • Updated 7590, Table 2A & 3A: removed INLDEM_5_UNIT 1 & 2; removed HNTGBH_7_UNIT 1 and added HNTGBH_2_PL1X3; Removed ALAMIT_7_UNIT 1, 2 & 6 and added ALAMIT_7_ES1 & ALAMIT_2_PL1X3. • Updated 7630, Table 3A: removed INLDEM_5_UNIT 1 & 2. Tables 3A & 3 B; removed HNTGBH_7_UNIT 1 and added HNTGBH_2_PL1X3; Removed ALAMIT_7_UNIT 1, 2 & 6 and added ALAMIT_7_ES1 & ALAMIT_2_PL1X3; updated to version 15.3, effective 9/29/21. • Updated 7680, Table 5A, 5B: removed INLDEM_5_UNIT 1 & 2; removed HNTGBH_7_UNIT 1 and added HNTGBH_2_PL1X3; Removed ALAMIT_7_UNIT 1, 2 & 6 and added ALAMIT_7_ES1 & ALAMIT_2_PL1X3. • Updated 7910, Table 3: Updated values from negatives to positives. • Updated 8610, Table 3A: added ETIWND_2_UNIT1. • Updated version and date only for the following procedures: <ul style="list-style-type: none"> ○ 6310: Updated to version 24.0, effective 9/01/21. ○ 7120: Updated to version 9.4, effective 10/15/21. • Removed Technical Review Section for consistency with others. 	
Version	Change	Date
28.1	<ul style="list-style-type: none"> • 7510, Table 4: Removed PANDOL_6_UNIT, as resource was retired. • 7630, Table 3A: Removed ANAHM_7_CT and Anaheim Peaker column, as resource was retired on 6/30/2020. • Updated version and date only for the following procedures: <ul style="list-style-type: none"> ○ 6110: version 11.1, effective 11/01/21 ○ 6310: version 24.3, effective 2/17/22 ○ 6410: version 10.0, effective 11/01/21 ○ 7430: version 24.4, effective 2/17/22 ○ 7820: version 17.2, effective 12/16/21 ○ 7910: version 5.5, effective 12/09/21 	3/10/22

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	<ul style="list-style-type: none"> Removed history prior to five years and typo corrections in 7320 (Table 3C) and Version History. 	
28.2	<ul style="list-style-type: none"> 7550: Removed Table 3A and updated to version 9.0, effective 5/27/22. 7570: Replaced existing tables with new Tables 3A to 3H, and updated to version 13.0, effective 5/27/22. 7580: Removed Tables 3A and 3B, updated Table 3D values and updated to version 11.0, effective 5/27/22. 7610: New effectiveness factors for Mesa 500/230 kV AA Banks with Table 1B and version 1.0, effective 5/27/22. 7630: Updated Tables 3A and 3B values and updated to version 16.0, effective 5/27/22. Updated version and date only for the following: <ul style="list-style-type: none"> 6110: Updated to version 11.2, effective 4/01/22 7120: Updated to version 9.5, effective 4/27/22 7230: Updated to version 14.0, effective 5/03/22 7430: Updated to version 25.0, effective 5/06/22 7450: Updated to version 2.5, effective 5/06/22 Updated instances of PG&E to PG&E for procedures consistency. Minor formatting and removed history prior to five years. 	5/27/22
28.3	<p>Periodic Review:</p> <ul style="list-style-type: none"> 7110: Updates made within all three tables due to an incorrect character used in place of an arrow. 7510: Removed Pandol from 66 kV Gen column since there are no resources listed for Pandol. Updated version and date only for the following: <ul style="list-style-type: none"> 6110: version 11.3, effective 8/18/22 6410: version 10.1, effective 6/13/22 6610: version 15.2, effective 7/07/22 7230: version 15.1, effective 8/11/22 7420: version 6.1, effective 9/09/22 7430: version 25.1, effective 8/04/22 7550: version 9.1, effective 8/02/22 7720: version 6.0, effective 12/01/20 7820: version 17.4, effective 8/02/22 7910: version 6.0, effective 7/29/22 Minor formatting and removed history prior to five years. 	10/20/22
28.4	<p>Updated version and effective date only for the following:</p> <ul style="list-style-type: none"> 6110: version 11.4, 11/01/22 6310: version 24.4, 1/12/23 6410: version 10.2, 11/01/22 6610: version 15.3, 11/01/22 7420: version 6.2, 1/23/23 	3/16/23

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	<ul style="list-style-type: none"> • 7430: version 25.2, 12/01/22 • 7630: version 16.1, 2/16/23 • 7820: version 17.5, 12/01/22 • 7910: version 6.1, 12/19/22 • 8610: version 4.1, 2/16/23 <p>Minor formatting and removed history prior to five years.</p>	
Version	Change	Date
28.5	<ul style="list-style-type: none"> • 8610: Updated values for generators and transmission as well as added new units due to Sylmar Bank E out-of-service for long duration. Updated to version 5.0, effective 6/01/23. • Updated version and date only for the following: <ul style="list-style-type: none"> ○ 6110 - version 11.6, effective 5/18/23 ○ 6310 - version 24.5, effective 5/01/23 ○ 7120 - version 9.6, effective 5/18/23 ○ 7410 - version 9.0, effective 4/27/23 ○ 7430 - version 25.3, effective 4/25/23 ○ 7450 - version 2.6, effective 4/13/23 ○ 7740 - version 5.1, effective 3/30/23 ○ 7820 - version 17.6, effective 3/30/23 	6/01/23
28.6	<ul style="list-style-type: none"> • 7820 Table 3D: Corrected Pio Pico Gen Effectiveness Factor from '17' to '-17'. <ul style="list-style-type: none"> ○ Updated to version 17.9, effective 9/14/23 • 7690: Added Tables 3F and 3G for new CPs. <ul style="list-style-type: none"> ○ Updated to version 4.0, effective 9/14/23 • Updated version and date only for the following: <ul style="list-style-type: none"> ○ 6110: version 12.0, effective 8/01/23 ○ 6410: version 10.5, effective 7/05/23 ○ 6610: version 15.5, effective 7/06/23 ○ 7110: version 13.1, effective 8/17/23 ○ 7230: version 15.2, effective 6/01/23 ○ 7240: version 14.0, effective 7/19/23 ○ 7320: version 24.2 (Date unchanged) ○ 7330: version 12.1, effective 6/08/23 ○ 7410: version 9.1, effective 8/07/23 ○ 7430: version 25.6, effective 8/17/23 ○ 7440: version 3.0, effective 6/08/23 ○ 7450: version 2.7, effective 8/31/23 ○ 7500: version 2.1, effective 6/08/23 ○ 7510: version 6.1, effective 8/10/23 ○ 7590: version 12.1, effective 7/06/23 ○ 7630: version 16.2, effective 6/01/23 ○ 7720: version 6.1, effective 8/17/23 	9/14/23

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28.7	<ul style="list-style-type: none"> • 7320: Added note regarding CP #27 included in 7340 since it requires Silicon Valley Power mitigation for alleviating overloads. Updated to version 24.4, effective 10/12/23 • 7430: Update to Table 3 Gen effectiveness for new CP #27. • Updated version and date only for the following: <ul style="list-style-type: none"> ○ 6310: version 24.6, effective 10/05/23 ○ 6410: version 10.6, effective 9/26/23 ○ 6610: version 15.6, effective 9/26/23 ○ 7110: version 13.2, effective 9/14/23 ○ 7230: version 15.3, effective 10/12/23 ○ 7410: version 9.2, effective 9/15/23 ○ 7630: version 16.3, effective 9/26/23 	10/12/23
28.8	<ul style="list-style-type: none"> • 7690: Added Tables 3E. Updated the CP# for Table 3A-3D. Updated the Table titles for 3F and 3G • Updated version and date only for the following: <ul style="list-style-type: none"> ○ 6110: version 12.1, effective 11/01/23 ○ 6410: version 10.7, effective 11/01/23 ○ 7230: version 15.3, effective 11/01/23 ○ 7320: version 24.5, effective 11/01/23 ○ 7410: version 9.3, effective 11/09/23 ○ 7430: version 25.7, effective 11/21/23 ○ 7570: version 13.1, effective 12/08/23 ○ 7580: version 11.1, effective 12/13/23 ○ 7820: version 18.1, effective 11/01/23 	12/15/23
28.9	<ul style="list-style-type: none"> • Added new 7760, Table 1D: Devers Area Generation Effectiveness - version 1.0, effective 4/09/24 • Updated version and date only for the following: <ul style="list-style-type: none"> ○ 6110: version 13.0, effective 4/01/24 ○ 6140: version 7.1, effective 2/22/24 ○ 6140A: version 2.2, effective 2/22/24 ○ 6310: version 25.0, effective 4/09/24 ○ 7230: version 15.4, effective 4/09/24 ○ 7240: version 14.1, effective 4/01/24 ○ 7320 : version 24.6, effective 2/29/24 ○ 7410: version 9.4, effective 1/11/24 ○ 7430: version 26.1, effective 4/01/24 ○ 7440: version 3.1, effective 4/01/24 ○ 7450: version 2.8, effective 4/01/24 ○ 7540: version 2.1, effective 10/12/23 ○ 7550: version 9.2, effective 1/04/24 ○ 7680: version 3.2, effective 1/04/24 ○ 7690: version 4.1, effective 3/29/24 ○ 7820: version 19.0, effective 2/29/24 	4/09/24

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29.0	<ul style="list-style-type: none"> • 7320: Removed Effectiveness factor for Contra Costa Carbon plant due to shutdown - version 24.7, effective 5/07/24 • 7410: Updated Tables 3A-1 and 3A-2 - Removed CPs 11 & 13. Added CPs 18, 19, 24, 25 & 26 with columns added for CPs 24, 25 & 26 (more units involved to mitigate) - version 9.5, effective 6/01/24. • 7640: New procedure added with Table 3 Effectiveness Factors – version 1.0, effective 6/01/24. • Updated version and date only for the following: <ul style="list-style-type: none"> ○ 6310: version 25.2, effective 6/01/04 ○ 6410: version 10.8, effective 6/01/24 ○ 7420: version 6.3, effective 4/30/24 ○ 7430: version 26.2, effective 4/22/24 ○ 7440: version 2.5, effective 5/16/24 ○ 7630: version 17.0, effective 6/01/24 ○ 7690: version 4.2, effective 5/09/24 ○ 7820: version 19.1, effective 6/01/24 	6/01/24
29.1	<ul style="list-style-type: none"> • 6610: Updated DF values and removed Table 4 – version 15.7, effective 6/12/24. • Updated version and date only for the following: <ul style="list-style-type: none"> ○ 6110: version 14.0, effective 6/06/24 ○ 6410: version 10.9, effective 6/04/24 ○ 7340: version 3.1, effective 6/06/24 ○ 7430: version 26.3, effective 6/06/24 ○ 7760: version 1.1, effective 6/04/24 	6/12/24
29.2	<ul style="list-style-type: none"> • Defined RTCA in Note at the beginning of procedure. • 6610: Updated GEF values for winter season, Tables 3A to 3D – version 16.1, effective 11/01/24. • Updated version and date only for the following: <ul style="list-style-type: none"> ○ 6110: version 14.1, effective 11/01/24 ○ 6310: version 26.2, effective 10/10/24 ○ 6410: version 11.0, effective 6/17/24 ○ 7110: version 13.3, effective 9/12/24 ○ 7120: version 9.7, effective 9/05/24 ○ 7240: version 14.2, effective 11/01/24 ○ 7340: corrected date to effective 6/06/24 ○ 7410: version 9.6, effective 11/01/24 ○ 7420: version 6.4, effective 7/26/24 ○ 7430: version 27.1, effective 7/25/24 ○ 7440: version 4.0, effective 10/28/24 ○ 7690: version 4.5, effective 11/01/24 ○ 7760: version 2.1, effective 10/14/24 ○ 7820: version 19.3, effective 11/01/24 	11/01/24

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Effectiveness Factors - All		Distribution Restriction: None

Version	Change	Date
29.3	<ul style="list-style-type: none"> • Removed REDOND_7_UNIT 5, 6 & 8 (Retired 12/31/23) from: <ul style="list-style-type: none"> ○ 6610 – Tables 3B & 3C ○ 7550 – Table 3B ○ 7570 – Tables 3A to 3H ○ 7590 – Tables 2A & 3A ○ 7610 – Table 1B ○ 7630 – Tables 3A & 3B ○ 7680 – Tables 5A & 5B • 7640: Table 3 - Removed HINSON_6_SERRGN (Retired 11/04/24) • Updated versions and dates only for the following: <ul style="list-style-type: none"> ○ 6110: version 14.2, effective 11/07/24 ○ 7230: version 15.5, effective 11/07/24 ○ 7410: version 9.7, effective 11/21/24 ○ 7820: version 19.4, effective 11/22/24 • Minor formatting and punctuation edits. 	12/05/24

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