



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)							Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Spring Off- Peak	2025 Spring Off- Peak	2030 Spring Off- Peak	2030 Winter Off- Peak	2022 SP Heavy Renewable & Min Gas Gen	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
500 kV LINES														
MALIN-ROUND MTN # 1 500 kV	Diablo unit and Malin-Round Mtn # 2 500 kV	P3	G-1/L-1	<95%	95.3%	N/A	<95%	<95%	<95%	<95%	106%	<95%	<95%	Sensitivity only
ROUND MTN –TABLE MTN #1 or #2 500 kV	Rnd Mtn –Table Mtn #2 or # 1 500 kV	P1	L-1	105%	N/A	N/A	<95%	<95%	<95%	<95%	103%	N/A	N/A	Bypass series capacitors on Round Mtn and Table Mtn on both lines as recommended in previous cycles
ROUND MTN-TABLE MTN # 2 or # 1 500 KV	Round Mtn-Table Mtn # 1 or # 2 and Table Mtn 500/230 kV	P6	L-1/T-1	106%	N/A	N/A	<95%	<95%	<95%	<95%	106%	N/A	N/A	
ROUND MTN-TABLE MTN # 1 500 KV	Round Mtn-Table Mtn # 2 and Table Mtn 500/230 kV	P2	BRK	106%	N/A	N/A	<95%	<95%	<95%	<95%	106%	N/A	N/A	
ROUND MTN-TABLE MTN # 1 or # 2 500 KV	Round Mtn-Table Mtn # 2 or # 1 500 KV and Diablo unit	P3	G-1/L-1	116%	N/A	N/A	<95%	<95%	<95%	<95%	113%	N/A	N/A	
ROUND MTN –ROUND MT STATCOM #1 or #2 500 kV	Round Mtn - Round Mtn Statcom # 1 or 2 500 kV	P1	L-1	N/A	114%	108%	<95%	<95%	<95%	<95%	N/A	115%	<95%	Bypass series capacitors on Round Mtn and Table Mtn on both lines as recommended in previous cycles
ROUND MTN –ROUND MT STATCOM #1 or #2 500 kV	Round Mtn - Round Mtn Statcom # 1 or 2 500 kV and Diablo unit	P3	G-1/L-1	N/A	127%	N/A	<95%	<95%	<95%	<95%	N/A	127%	<95%	
ROUND MTN –ROUND MT STATCOM #1 or #2 500 kV	Round Mtn - Round Mtn Statcom # 2 or 1 and Table Mtn-Round Mtn Statcom # 2 or # 1 500 kV	P6	L-1/L-1	N/A	104%	98%	<95%	<95%	<95%	<95%	N/A	106%	<95%	
ROUND MTN –ROUND MT STATCOM #1 or #2 500 kV	Round Mtn - Round Mtn Statcom # 1 or 2 500 kV and Round Mtn 500/230	P6	L-1/T-1	N/A	106%	100%	<95%	<95%	<95%	<95%	N/A	107%	<95%	
ROUND MT STATCOM - ROUND MTN #2 500 kV	Round Mtn Statcom-Round Mtn # 1 and Round Mtn 500/230 kV	P2/P6	BRK	N/A	106%	99%	<95%	<95%	<95%	<95%	N/A	107%	<95%	
TABLE MTN –ROUND MT STATCOM #1 or #2 500 kV	Table Mtn - Round Mtn Statcom # 1 or 2 500 kV and Diablo unit	P3	G-1/L-1	N/A	116%	N/A	<95%	<95%	<95%	<95%	N/A	115%	<95%	Bypass series capacitors on Round Mtn and Table Mtn on both lines as recommended in previous cycles
TABLE MTN –ROUND MT STATCOM #1 or #2 500 kV	Round Mtn Statcom - Table Mtn # 1 or 2 500 kV	P1	L-1	N/A	105%	99%	<95%	<95%	<95%	<95%	N/A	106%	<95%	
TABLE MTN –ROUND MT STATCOM #1 or #2 500 kV	Round Mtn - Round Mtn Statcom # 2 or 1 and Table Mtn-Round Mtn Statcom # 2 or # 1 500 kV	P6	L-1/L-1	N/A	103%	98%	<95%	<95%	<95%	<95%	N/A	105%	<95%	
TABLE MTN –ROUND MT STATCOM #1 or # 2 500 kV	Round Mtn Statcom - Table Mtn # 2 or # 1 500 kV and Table Mtn 500/230 kV	P6	L-1/T-1	N/A	107%	102%	<95%	<95%	<95%	<95%	N/A	106%	<95%	
TABLE MTN –ROUND MT STATCOM #1 500 kV	Round Mtn Statcom-Table Mtn # 2 and Table Mtn 500/230 kV	P2	BRK	N/A	106%	<95%	<95%	<95%	<95%	<95%	N/A	106%	<95%	
MIDWAY-WHIRLWIND # 3 500 kV	Midway-Vincent # 2 and Midway-Whirlwind	P7	L-2	<95%	<95%	<95%	<95%	<95%	<95%	<95%	98%	<95%	113%	Sensitivity Only
MIDWAY-VINCENT # 1 500 kV	Midway-Vincent # 2 and Midway-Whirlwind	P6	L-1/L-1	104%	<95%	<95%	98%	<95%	<95%	<95%	106%	<95%	123%	Existing Path 26 procedure under review.
MIDWAY-VINCENT # 2 500 kV	Midway-Vincent # 1 and Midway-Whirlwind 500 kV	P6	L-1/L-1	106%	<95%	<95%	100%	<95%	<95%	<95%	108%	<95%	126%	
ANTELOPE-WHIRLWIND (SCE) 500 kV	Midway-Vincent # 1 and # 2 500 kV	P7	L-2	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	103%	Sensitivity only
500/230 kV TRANSFORMERS														



ROUND MTN 500/230 kV x-former	Olinda 500/230 kV x-former	P1	T-1	<95%	<95%	<95%	<95%	109%	101%	101%	<95%	<95%	115%	Reduce COI flow according to the nomogram
	Captain Jack-Olinda 500 kV	P1	L-1	<95%	<95%	<95%	<95%	105%	<95%	<95%	<95%	<95%	108%	
	Captain Jack-Olinda 500 kV and Olinda 500/230 kV transformer	P6	L-1/T-1	<95%	<95%	<95%	<95%	116%	107%	105%	<95%	<95%	121%	
	Olinda 500/230 kV x-former and Olinda-Tracy 500 kV line	P6	L-1/T-1	<95%	<95%	<95%	96%	116%	107%	105%	<95%	<95%	123%	
	Diablo unit and Capt Jack-Olinda 500 kV	P3	G-1/L-1	<95%	<95%	<95%	<95%	97%	N/A	N/A	<95%	<95%	101%	
	Diablo unit and Olinda 500/230 kV kV	P3	G-1/T-1	<95%	<95%	<95%	<95%	107%	N/A	N/A	<95%	<95%	113%	
	Olinda-Tracy 500 kV and Captain Jack-Olinda 500 kV	P6	L-1/L-1	<95%	<95%	<95%	<95%	116%	107%	104%	<95%	<95%	122%	
	Round Mnt-Round Mnt Statcom # 1 and #2 500 kV	P7	L-2	<95%	<95%	<95%	<95%	115%	106%	<95%	<95%	<95%	119%	
	Table Mnt-Round Mnt Statcom # 1 and #2 500 kV	P7	L-2	<95%	<95%	<95%	<95%	125%	115%	96%	<95%	<95%	128%	
TABLE MTN 500/230 kV x-former	Table Mtn-Vaca Dix 500 kV	P1	L-1	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	101%	Reduce COI flow according to the nomogram
	Captain Jack-Olinda 500 kV	P1	L-1	<95%	<95%	<95%	<95%	96%	96%	<95%	<95%	<95%	103%	
	Round Mtn 500/230 kV x-former	P1	T-1	<95%	<95%	<95%	<95%	96%	95%	95%	<95%	<95%	102%	
	Tesla 500/230 kV x-former	P1	T-1	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	101%	
	Vaca Dix 500 kV stuck BRK- lines to Table Mtn & transformer #11	P2/P6	BRK	<95%	<95%	<95%	<95%	96%	97%	<95%	<95%	<95%	103%	
	Round Mtn 500 kV stuck BRK- line to Table Mtn # 2 & x-former	P2/P6	L-1/T-1	<95%	<95%	<95%	<95%	97%	96%	95%	<95%	<95%	104%	
	Round Mtn 500 kV stuck BRK- line to Table Mtn # 1 & x-former	P2/P6	BRK	<95%	<95%	<95%	<95%	97%	96%	95%	<95%	<95%	104%	
	Table Mtn 500 kV stuck BRK- line to Vaca Dix and Round Mnt	P2/P6	BRK	<95%	<95%	<95%	<95%	96%	97%	<95%	<95%	<95%	103%	
	Diablo unit and Capt Jack-Olinda 500 kV	P3	G-1/L-1	<95%	<95%	<95%	<95%	<95%	N/A	<95%	<95%	<95%	101%	
	Round Mtn 500/230 and Diablo unit	P3	G-1/T-1	<95%	<95%	<95%	<95%	<95%	N/A	<95%	<95%	<95%	101%	
	Olinda-Tracy 500 kV and Olinda 500/230 kV transformer	P6	L-1/T-1	<95%	<95%	<95%	<95%	97%	97%	95%	<95%	<95%	104%	
	Table Mnt-Tesla 500 kV and Tesla 500/230 kV transformer	P6	L-1/T-1	<95%	<95%	<95%	<95%	97%	98%	<95%	<95%	<95%	103%	
	Table Mtn-Vaca Dix and Table Mtn-Tesla 500 kV	P7	L-2	<95%	<95%	<95%	<95%	102%	104%	<95%	<95%	<95%	102%	
	Table Mtn-Tesla and Vaca Dix-Tesla 500 kV	P7	L-2	<95%	<95%	<95%	<95%	100%	101%	<95%	<95%	<95%	108%	
	Captain Jack-Olinda 500 kV and Olinda 500/230 kV transformer	P6	L-1/T-1	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	102%	



TESLA 500/230 kV # 6	Tesla-Metcalf and MossIndg-Los Banos 500 kV	P6	L-1/L-1	<95%	<95%	<95%	<95%	<95%	<95%	<95%	102%	<95%	<95%	sensitivity only
METCALF 500/230 kV x-former #11, 12 or 13	Metcalf 500/230 kV Tranformers #11 & #12 or #13	P6	T-1/T-1	<95%	<95%	<95%	129%	<95%	<95%	<95%	127%	<95%	<95%	Increase generation in the area after 1st contingency
LOS BANOS 500/230 kV transformer	Gates 500/230 kV # 11 and # 12 transformers	P6	T-1/T-1	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	102%	sensitivity only
GATES 500/230 kV # 11 x-former	Gates 500/230 kV # 12 x-former	P1	T-1	<95%	<95%	<95%	95%	122%	95%	<95%	105%	<95%	156%	Reduce generation in the area
	Losbanos-Gates #3 500kV & Gates # 12 230/500kV	P6	L-1/T-1	<95%	<95%	<95%	106%	117%	<95%	<95%	104%	<95%	154%	
	Losbanos-Gates #1 500kV & Gates# 12 230/500kV	P6	L-1/T-1	<95%	<95%	<95%	124%	109%	<95%	<95%	99%	<95%	151%	
	Gates-Diablo 500 kV and Gates 500/230 # 12	P6	L-1/T-1	<95%	<95%	<95%	<95%	125%	<95%	<95%	110%	<95%	157%	
	Gates-MlIdway 500 kV and Gates 500/230 # 12	P6	L-1/T-1	<95%	<95%	<95%	<95%	114%	<95%	<95%	<95%	<95%	125%	
	LOSBANOS 230/500kV & GATES 230/500kV # 12	P6	T-1/T-1	<95%	<95%	<95%	108%	142%	106%	<95%	115%	<95%	182%	
	MIDWAY 230/500kV & GATES 230/500kV #12	P6	T-1/T-1	<95%	<95%	<95%	99%	130%	102%	<95%	110%	<95%	167%	
	Los Banos-Gates 500 kV # 1 and Los Banos-Midway 500 kV	P7	L-2	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	101%	
	Gates 500/230 kV # 12 x-former and Diablo unit	P3	G-1/T-1	<95%	<95%	<95%	<95%	131%	N/A	N/A	113%	<95%	165%	
GATES 500/230 kV # 12 x-former	Gates 500/230 kV # 11 x-former	P1	T-1	<95%	<95%	<95%	<95%	114%	<95%	N/A	99%	<95%	146%	Reduce generation in the area
	Los Banos-Gates # 1 and # 3 500 kV	P6	L-1/L-1	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	145%	
	Losbanos-Gates #3 500kV & Gates# 11 230/500kV	P6	L-1/T-1	<95%	<95%	<95%	98%	109%	<95%	<95%	97%	<95%	145%	
	Losbanos-Gates #1 500kV & Gates# 11 230/500kV	P6	L-1/T-1	<95%	<95%	<95%	117%	101%	<95%	<95%	<95%	<95%	143%	
	Gates-Diablo 500 kV and Gates 500/230 # 11	P6	L-1/T-1	<95%	<95%	<95%	<95%	117%	<95%	<95%	104%	<95%	148%	
	Gates-MlIdway 500 kV and Gates 500/230 # 11	P6	L-1/T-1	<95%	<95%	<95%	<95%	106%	<95%	<95%	<95%	<95%	117%	
	LOSBANOS 230/500kV & GATES 230/500kV #11	P6	T-1/T-1	<95%	<95%	<95%	100%	132%	103%	<95%	109%	<95%	173%	
	MIDWAY 230/500kV & GATES 230/500kV #11	P6	T-1/T-1	<95%	<95%	<95%	<95%	120%	99%	<95%	104%	<95%	158%	
	Los Banos-Gates 500 kV # 1 and Los Banos-Midway 500 kV	P7	L-2	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	100%	
Gates 500/230 kV # 11 x-former and Diablo unit	P3	G-1/T-1	<95%	<95%	<95%	<95%	123%	N/A	N/A	107%	<95%	156%		
230 kV LINES														



COTTONWD E-ROUND MTN 230kV #2	Table Mtn-Vaca Dix and Table Mtn-Tesla 500 kV	P7	L-2	<95%	<95%	<95%	<95%	<95%	<95%	<95%	108%	<95%	<95%	Sensitivity only
COTTONWD E-ROUND MTN 230kV #3	Table Mtn-Vaca Dix and Table Mtn-Tesla 500 kV	P7	L-2	99%	100%	97%	<95%	<95%	<95%	<95%	118%	96%	<95%	
TABLE MTN-RIO OSO 230 kV	Tbl Mtn-Vaca Dix 500 kV and Table Mtn-Palermo 230 kV	P6	L-1/L-1	109%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	Project: Rio Oso 230 kV BAAH Bus Upgrade Project ISD: Dec 2022, modeled in 2025 and 2030 cases Short term: COI Nomogram
	Table Mtn-Vaca Dix and Table Mtn-Tesla 500 kV	P7	L-2	100%	<95%	<95%	<95%	<95%	<95%	<95%	98%	<95%	<95%	
NEWARK-LOS ESTEROS 230 kV	Tesla-Metcalf and MossIndg-Los Banos 500 kV	P6	L-1/L-1	<95%	<95%	<95%	119%	<95%	<95%	<95%	120%	<95%	<95%	generation redispatch after first contingency
	Tesla-Metcalf and MossIndg-Metcalf 500 kV	P6	L-1/L-1	<95%	<95%	<95%	<95%	<95%	<95%	<95%	98%	<95%	<95%	
NEWARK-E-F BRK (to LOS ESTEROS) 230 kV	Tesla-Metcalf and MossIndg-Los Banos 500 kV	P6	L-1/L-1	<95%	<95%	<95%	119%	<95%	<95%	<95%	118%	<95%	<95%	
	Tesla-Metcalf and MossIndg-Metcalf 500 kV	P6	L-1/L-1	<95%	<95%	<95%	<95%	<95%	<95%	<95%	99%	<95%	<95%	
NEWARK-TESLA # 1 230 kV	Tesla-Metcalf and MossIndg-Los Banos 500 kV	P6	L-1/L-1	<95%	<95%	<95%	100%	<95%	<95%	<95%	<95%	<95%	<95%	
NEWARK-TESLA # 2 230 kV	Tesla-Metcalf and MossIndg-Los Banos 500 kV	P6	L-1/L-1	<95%	<95%	<95%	101%	<95%	<95%	<95%	97%	<95%	<95%	generation redispatch after first contingency
DELTA PUMPS-TESLA 230 kV	Table Mtn-Vaca Dix and Vaca Dix-Tesla 500 kV	P6	L-1/L-1	<95%	<95%	<95%	101%	<95%	<95%	<95%	<95%	<95%	<95%	
	VACA-DIX 230/500kV #11 & #12, or 13	P6	T-1/T-1	<95%	<95%	<95%	103%	<95%	<95%	<95%	<95%	<95%	<95%	generation redispatch after first contingency
GOLDHILL-EIGHT MILE 230 kV	Table Mtn 500/230 kV and Eight Mile-Lodi 230 kV	P6	T-1/L-1	<95%	<95%	<95%	<95%	109%	117%	<95%	<95%	<95%	118%	
	Table Mtn 500/230 kV and Goldhill-Lodi 230 kV	P6	T-1/L-1	<95%	<95%	<95%	<95%	105%	112%	<95%	<95%	<95%	118%	
GOLDHILL-LODI 230 kV	Table Mtn 500/230 kV and Gold Hill-Eight Mile 230 kV	P6	T-1/T-1	<95%	<95%	<95%	<95%	105%	113%	<95%	<95%	<95%	119%	generation redispatch after first contingency
EIGHT MILE -TESLA 230 kV	Table Mtn 500/230 kV and Stagg-Eight Mile 230 kV	P6	T-1/L-1	<95%	<95%	<95%	<95%	134%	147%	<95%	<95%	<95%	145%	
	Table Mtn 500/230 kV and Stagg-Tesla 230 kV, or Stagg BRK	P6	T-1/L-1	<95%	<95%	<95%	<95%	134%	153%	<95%	<95%	<95%	148%	
	Table Mtn 500/230 kV and Round Mtn 500/230 kV transformers	P6	T-1/T-1	<95%	<95%	<95%	<95%	<95%	102%	97.1%	<95%	<95%	99.2%	
STAGG-EIGHT MILE 230 kV	Table Mtn 500/230 kV and Eight Mile-Tesla 230 kV	P6	T-1/L-1	<95%	<95%	<95%	<95%	118%	127%	<95%	<95%	<95%	126%	generation redispatch after first contingency
STAGG H - STAGG F BRK 230 kV		P6	T-1/L-1	<95%	<95%	<95%	<95%	<95%	104%	<95%	<95%	<95%	103%	
STAGG D - STAGG F BRK 230 kV		P6	T-1/L-1	<95%	<95%	<95%	<95%	<95%	105%	<95%	<95%	<95%	103%	
STAGG-TESLA E 230 kV		P6	T-1/L-1	<95%	<95%	<95%	<95%	117%	135%	<95%	<95%	<95%	130%	
BELLOTA-WEBER 230 kV	Table Mtn 500/230 kV and Bellota-Tesla 230 kV	P6	T-1/L-1	<95%	<95%	<95%	<95%	104%	106%	<95%	<95%	<95%	108%	Under Review for generation redispatch mitigation
TESLA-WEBER 230 kV		P6	T-1/L-1	<95%	<95%	<95%	<95%	104%	113%	<95%	<95%	<95%	112%	



BELLOTA-TESLA 230 kV	Table Mtn 500/230 kV and Bellota-Weber 230 kV	P6	T-1/L-1	<95%	<95%	<95%	<95%	104%	109%	<95%	<95%	<95%	110%	Under review for generation redispatch mitigation
	Table Mtn 500/230 kV and Tesla-Weber 230 kV	P6	T-1/L-1	<95%	<95%	<95%	<95%	104%	111%	<95%	<95%	<95%	111%	
DELEVAN-CORTINA 230 KV	Olinda-Tracy 500 kV and Diablo unit	P3	G-1/L-1	<95%	101%	N/A	<95%	<95%	<95%	<95%	<95%	97%	<95%	Reduce generation in the area
	Round Mtn Statcom-Round Mtn 500 kV #2 and Malin-Round Mtn # 2 500 kV	P6	L-1/L-1	101%	103%	99%	<95%	<95%	<95%	<95%	<95%	101%	<95%	
	Round Mtn-Table Mtn 500 kV #1 and #2 500 kV	P7	L-2	101%	N/A	N/A	<95%	<95%	<95%	<95%	<95%	N/A	<95%	
	Round Mtn Statcom-Table Mtn 500 kV #1 and #2 500 kV	P7	L-2	N/A	103%	99%	<95%	<95%	<95%	<95%	<95%	101%	<95%	
	Round Mtn-Round Mtn Statcom 500 kV #1 and #2 500 kV	P7	L-2	N/A	103%	99%	<95%	<95%	<95%	<95%	<95%	101%	<95%	
	Table Mtn-Vaca Dix and Table Mtn-Tesla 500 kV	P7	L-2	103%	107%	103%	<95%	<95%	<95%	<95%	<95%	102%	<95%	
MOSSLANDING-LAS AGUILAS 230 kV	Mosslanding-Los Banos 500 kV & Tesla-Metcalf 500 kV	P6	L-1/L-1	<95%	<95%	<95%	149%	106%	110%	<95%	156%	<95%	<95%	Turning off generation in the area for P6 will not eliminate overloads without turning on Moss Landing generation in some cases.
PANOCHÉ-GATES # 1 and # 2 230 kV	Los Banos-Gates # 1 and # 3 500 kV	P6	L-1/L-1	<95%	<95%	<95%	106%	<95%	<95%	<95%	<95%	<95%	<95%	Use Path 15 procedure for high Path 15 flow
230/115 kV TRANSFORMERS														
NEWARK 230/115 kV #11	Tesla-Metcalf 500 kV and Newark -Los Esteros 230 kV kV	P6	L-1/L-1	<95%	95%	101%	<95%	<95%	<95%	<95%	<95%	99%	<95%	generation redispatch after first contingency
	Tesla-Metcalf 500 kV and Newark E-F 230 kV kV bus tie (to Los Esteros)	P6	L-1/BRK	99%	100%	106%	<95%	<95%	<95%	<95%	98%	105%	<95%	
115 kV LINES														
NEWARK-NRS 115 kV	Tesla-Metcalf 500 kV and Newark- Newark brk (to Los Esteros) 115 kV	P6	L-1/L-1	<95%	<95%	101%	<95%	<95%	<95%	<95%	<95%	<95%	<95%	generation redispatch after first contingency
KRS-FMC 115 kV	Tesla-Metcalf and MossIndg-Los Banos 500 kV	P6	L-1/L-1	<95%	<95%	<95%	112%	<95%	<95%	<95%	<95%	<95%	<95%	generation redispatch after first contingency
AMES-MT VIEW 115 kV	Tesla-Metcalf and MossIndg-Los Banos 500 kV	P6	L-1/L-1	<95%	<95%	<95%	109%	<95%	<95%	<95%	<95%	<95%	<95%	
AMES-WHISMAN 115 kV	Tesla-Metcalf and MossIndg-Los Banos 500 kV	P6	L-1/L-1	<95%	<95%	<95%	116%	<95%	<95%	<95%	<95%	<95%	<95%	

Study Area: PG&E Bulk

Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Post Cont. Voltage, kV (Baseline Scenarios)							Post Cont. Voltage, kV (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2030 Spring Off-Peak	2030 Winter Off-Peak	2022 SP Heavy Renewable & Min Gas Gen	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
ROUND MTN	Round Mt-Malin # 2 and Round Mt 500/230	P2	BRK	within limits	within limits	within limits	1.107	within limits	within limits	within limits	within limits	within limits	within limits	Round Mtn dynamic reactive support will mitigate
	Olinda-Tracy and Diablo unit	P3	G-1/L-1	within limits	within limits	within limits	within limits	within limits	within limits	within limits	0.986	within limits	within limits	reduce COI flow after first contingency
TABLE MTN 500 kV	Olinda-Tracy and Diablo unit	P3	G-1/L-1	within limits	within limits	within limits	within limits	within limits	within limits	within limits	0.983	within limits	within limits	reduce COI flow after first contingency

Study Area: PG&E Bulk

Voltage Deviation



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)							Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2029 Spring Off-Peak	2029 Winter Off-Peak	2021 SP Heavy Renewable & Min Gas Gen	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	
NONE over 8%														

**Transient Stability**

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault TESLA-METCALF 500 kV	P1	L-1	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	no issues	no issues	Potential WECC/NERC criteria violation	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping. Review Dawson unit model because of undamped oscillations, also in other cases
3 phase fault TESLA - LOSBANOS 500 kV	P1	L-1	no issues	Potential WECC/NERC criteria violation	no issues	no issues	Potential WECC/NERC criteria violation	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping. Review Dawson unit model because of undamped oscillations, also in other cases
3 phase fault METCALF - MOSSLAND 500 kV	P1	L-1	no issues	Potential WECC/NERC criteria violation	no issues	no issues	no issues	no issues	Change UVLS relay settings on Watsonville load (Peak cases)
3 phase fault LOSBANOS -GATES 500 kV # 3	P1	L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOSBANOS -GATES 500 kV # 1	P1	L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOSBANOS - MIDWAY 500 kV	P1	L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES - DIABLO 500 kV	P1	L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault GATES - MIDWAY 500 kV	P1	L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY - VINCENT 500 kV # 1	P1	L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-WHIRLWIND 500 kV	P1	L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase faultTRACY 500/230 kV transformer # 1	P1	T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Chilibar generator model for errors because of out-of-step tripping
3 phase fault TESLA 500/230 kV transformer # 4	P1	T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping
3 phase fault METCALF 500/230 kV transformer # 11	P1	T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases).
3 phase fault LOS BANOS 500/230 kV transformer	P1	T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES 500/230 kV transformer # 11	P1	T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault MIDWAY 500/230 kV transformer # 11	P1	T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
LOSE LOSBANOS-MIDWAY #1 500KV LINE & MIDWAY-VINCENT #1 500KV 1 PHASE FAULT ON MIDWAY 500KV BUS - DELAYED CLEARING	P2	STUCK BRK	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
LOSE GATES-MIDWAY #1 500KV LINE & DIABLO-MIDWAY #2 500KV LINE 1 PHASE FAULT ON MIDWAY 500KV BUS - DELAYED CLEARING	P2	STUCK BRK	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
LOSE MIDWAY-VINCENT #1 500KV LINE & MIDWAY #11 500/230KV BANK 1 PHASE FAULT ON MIDWAY 500KV BUS - DELAYED CLEARING	P2	STUCK BRK	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
LOSE MIDWAY-WIRLWIND #3 500KV LINE & MIDWAY #11 500/230KV BANK 1 PHASE FAULT ON MIDWAY 500KV BUS - DELAYED CLEARING	P2	STUCK BRK	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 PHASE FAULT, DELAYED CLEARING ON DIABLO GENERATOR FAULT ON DIABLO 500KV BUS	P4	3ph delayed clearing	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault TESLA-TABLE MTN 500 kV and TESLA-TRACY 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA-TABLE MTN 500 kV and TESLA-METCALF 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)

**Transient Stability**

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase faultTESLA-TABLE MTN 500 kV and TESLA-LOS BANOS 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA-VACA DIX 500 kV and TESLA-TRACY 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA-VACA DIX 500 kV and TESLA-METCALF 500 kV	P6	L-1/L-1	Potential WECC/NERC criteria violations	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA-VACA DIX 500 kV and TESLA-LOS BANOS 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA-TRACY 500 kV and TESLA-METCALF 500 kV	P6	L-1/L-1	Potential WECC/NERC criteria violations	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA-TRACY 500 kV and TESLA-LOS BANOS 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA-METCALF 500 kV and TESLA-LOS BANOS 500 kV	P6	L-1/L-1	UVLS Watsonville load	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault METCALF-TESLA 500 kV and METCALF- MOSS LANDING 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Dawson unit model because of undamped oscillations

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault LOS BANOS-TRACY 500 kV and LOS BANOS-MOSS LANDING 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-TRACY 500 kV and LOS BANOS-GATES 500 kV # 3	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-TRACY 500 kV and LOS BANOS-GATES 500 kV # 1	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-TRACY 500 kV and LOS BANOS-MIDWAY 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-TESLA 500 kV and LOS BANOS-MOSS LANDING 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-TESLA 500 kV and LOS BANOS-GATES 500 kV # 3	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-TESLA 500 kV and LOS BANOS-GATES 500 kV # 1	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-TESLA 500 kV and LOS BANOS-MIDWAY 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault LOS BANOS-MOSS LANDING 500 kV and LOS BANOS-GATES 500 kV # 3	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-MOSS LANDING 500 kV and LOS BANOS-GATES 500 kV # 1	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-MOSS LANDING 500 kV and LOS BANOS-MIDWAY 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-GATES 500 kV # 1 and # 3, fault on Los Banos	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-GATES 500 kV # 1 and LOS BANOS-MIDWAY 500 kV, fault on Los Banos	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES-LOSBANOS 500 kV # 1 and 3, fault on Gates	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES-LOSBANOS 500 kV # 1 and GATES-DIABLO 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES-LOS BANOS 500 kV # 1 and GATES - MIDWAY 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES-LOS BANOS 500 kV # 1 and GATES-DIABLO 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault GATES-LOS BANOS 500 kV # 1 and GATES-MIDWAY 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES-DIABLO 500 kV and GATES-MIDWAY 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-LOS BANOS 500 kV and MIDWAY-DIABLO 500 kV # 2	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-LOS BANOS 500 kV and MIDWAY-VINCENT 500 kV #1	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-LOS BANOS 500 kV and MIDWAY-WHIRLWIND 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY- GATES 500 kV and MIDWAY-DIABLO 500 kV # 2	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY- GATES 500 kV and MIDWAY-VINCENT 500 kV #1	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY- GATES 500 kV and MIDWAY-WHIRLWIND 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-DIABLO 500 kV # 2 and 3	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault MIDWAY- DIABLO # 2 500 kV and MIDWAY-VINCENT # 1 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY- DIABLO # 2 500 kV and MIDWAY-WHIRLWIND 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY- VINCENT # 1 500 kV and MIDWAY-WHIRLWIND 500 kV	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault TESLA-METCALF and MOSS LANDING-LOS BANOS 500 kV, fault on METCALF	P6	L-1/L-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Dawson unit model because of undamped oscillations
3 phase fault TESLA - TABLE MTN 500 kV and TESLA 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA - VACA DIX 500 kV and TESLA 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review steam unit at Sobrante Standard Oil model for errors because of out-of-step tripping (2030)
3 phase fault TESLA - METCALF 500 kV and TESLA 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit and Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault TESLA - METCALF 500 kV and TESLA 500/230 kV transformer	P6	L-1/T-1	Potential WECC/NERC criteria violations	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)

**Transient Stability**

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault TESLA - LOSBANOS 500 kV and TESLA 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault LOS BANOS-TRACY 500 kV and LOS BANOS 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS-TESLA 500 kV and LOS BANOS 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS- MOSS LANDING 500 kV and LOS BANOS 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS- GATES 500 kV # 3 and LOS BANOS 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS- GATES 500 kV # 1 and LOS BANOS 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault LOS BANOS- MIDWAY 500 kV and LOS BANOS 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES-LOSBANOS 500 kV # 3 and GATES 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault GATES-LOS BANOS 500 kV # 1 and GATES 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES-DIABLO 500 kV and GATES 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault GATES-MIDWAY 500 kV and GATES 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-LOS BANOS 500 kV and MIDWAY 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-GATES 500 kV and MIDWAY 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-DIABLO 500 kV and MIDWAY 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-VINCENT 500 kV # 1 and MIDWAY 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-WHIRLWIND 500 kV and MIDWAY 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault TRACY-LOS BANOS 500 kV and TRACY 500/230 kV transformer	P6	L-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Chilibar hydro unit model for errors because of out-of-step tripping (2030)
3 phase fault TESLA 500/230 kV transformers # 2 and 4	P6	T-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit at Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault METCALF 500/230 kV transformers # 11 and 12	P6	T-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load
3 phase fault GATES 500/230 kV transformers # 11 and 12	P6	T-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load
3 phase fault MIDWAY 500/230 kV transformers # 11 and 12	P6	T-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault TRACY 500/230 kV transformers # 1 and 2	P6	T-1/T-1	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Chilibar hydro unit model for errors because of out-of-step tripping (2030)
3 phase fault TESLA-TABLE MTN 500 kV and TESLA-VACA DIX 500 kV	P7	L-2	Potential WECC/NERC criteria violations	Potential WECC/NERC criteria violations	no issues	no issues	Potential WECC/NERC criteria violations	no issues	Change UVLS relay settings on Watsonville load (Peak cases). Review Chilibar hydro unit and steam unit and Sobrante Standard Oil models for errors because of out-of-step tripping (2030)
3 phase fault LOS BANOS- TRACY 500 kV and LOS BANOS -TESLA 500 kV	P7	L-2	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Transient Stability

			Transient Stability Performance (Number of voltage and frequency violations)						
Contingency	Category	Category Description	Baseline scenarios				Sensitivity		Potential Mitigation Solutions/ Comments
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2030 Spring Off- Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	
3 phase fault LOS BANOS-GATES 500 kV # 1 and LOS BANOS-MIDWAY 500 kV	P7	L-2	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-LOS BANOS 500 kV and MIDWAY-GATES 500 kV	P7	L-2	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping
3 phase fault MIDWAY-VINCENT # 1 and 2 500 kV	P7	L-2	no issues	Potential WECC/NERC criteria violations	no issues	no issues	no issues	no issues	Review Clearwater (SCE) generator model for errors because of out-of-step tripping

Study Area: PG&E Bulk



Single Contingency Load Drop

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)										Potential Mitigation Solutions
			2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Spring Off- Peak	2024 Spring Off- Peak	2029 Spring Off- Peak	2029 Winter Off- Peak	2021 SP Heavy Renewable & Min Gas Gen	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	
N/A													

No single contingency resulted in total load drop of more than 250 MW.

Study Area: PG&E Bulk



Single Source Substation with more than 100 MW Load

Substation	Load Served (MW)										Potential Mitigation Solutions
	2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Spring Off- Peak	2024 Spring Off- Peak	2029 Spring Off- Peak	2029 Winter Off- Peak	2021 SP Heavy Renewable & Min Gas Gen	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	
N/A											

No single source substation with more than 100 MW Load