



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
AMES-Mountain View 115 kV	MONTAVIS 230kV - Section 2E & 2D	P2	Bus/Breaker	140	133	150	71	73	82	94	48	133	43	103	Diverge	149	Under review for potential modeling issues
AMES-Whisman 115 kV	MONTAVIS 230kV - Section 2E & 2D	P2	Bus/Breaker	134	144	162	80	85	88	100	66	144	62	117	Diverge	162	Under review for potential modeling issues
Bair 115/60kV Transformer #1	CLY LND 115/60KV TB 1 & CLY LND2 115/60KV TB 2	P6	N-1-1	<100	139	157	<100	146	162	<100	<100	142	<100	111	<100	<100	Operating solution as recommended in 2018-2019 TP.
Bair-Cooley Landing #1 60kV Line	CLY LND 115/60KV TB 1 & CLY LND2 115/60KV TB 2	P6	N-1-1	<100	124	142	<100	114	133	<100	<100	125	<100	92	<100	<100	Operating solution as recommended in 2018-2019 TP.
Bair-Cooley Landing #2 60kV Line	CLY LND 115/60KV TB 1 & CLY LND2 115/60KV TB 2	P6	N-1-1	<100	106	119	<100	84	92	<100	<100	107	<100	88	<100	87	Operating solution as recommended in 2018-2019 TP.
Birds Landing - Contra Costa PP 230 kV Line	BIRDS LANDING SW STA-CONTRA COSTA SUB 230kV [6161]	P1	N-1	50	62	62	1	2	3	70	24	55	52	101	69	63	Sensitivity only
Birds Landing - Contra Costa Sub 230 kV Line	C.COSTAPPD - 1D 230kV & MARSHLD1-C.COSTAPPD #1 line	P2	Bus/Breaker	85	96	97	6	6	36	63	21	89	48	90	Diverge	97	Under review for potential modeling issues
Birds Landing - Contra Costa Sub 230 kV Line	C.COSTAPPD 230kV Section 1D	P2	Bus/Breaker	85	96	97	6	6	36	63	21	89	48	90	Diverge	97	Under review for potential modeling issues
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	Normal	P0	N-0	<100	<100	95	<100	<100	55	<100	<100	<100	<100	<100	103	113	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	CONTRA COSTA-LAS POSITAS 230kV [4510]	P1	N-1	87	95	99	42	44	61	44	18	97	20	71	107	117	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	LAS POSITAS-NEWARK 230kV [4980]	P1	N-1	81	88	92	37	40	56	39	17	91	18	66	100	109	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	PPASSJCT-NEWARK E #2 230kV [0]	P1	N-1	80	87	92	39	42	56	44	17	90	17	69	100	109	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	ROSSMOOR-MORAGA-C.COSTAPPE 230kV [0]	P1	N-1	78	86	91	39	41	56	40	18	89	18	64	98	107	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	TESLA-NEWARK #1 230kV [5720]	P1	N-1	80	86	92	41	44	57	46	21	89	20	70	100	108	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	C.COSTAPPD Section 1D & C.COSTAPPE Section 1E 230kV	P2	Bus/Breaker	136	Diverge	128	107	107	124	7	5	136	5	41	Diverge	151	Under review for potential modeling issues
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	C.COSTAPPE - 1E 230kV & ROSSMOOR-MORAGA-C.COSTAPPE line	P2	Bus/Breaker	136	120	128	107	107	124	7	5	136	5	41	Diverge	151	Under review for potential modeling issues
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	C.COSTAPPE 230kV Section 1E	P2	Bus/Breaker	136	120	128	107	107	124	7	5	136	5	41	Diverge	151	Under review for potential modeling issues
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	C.COSTAPPE Section 1E & C.COSTAPPF Section 1F 230kV	P2	Bus/Breaker	136	120	128	107	107	124	7	5	136	5	41	Diverge	151	Under review for potential modeling issues
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	C.COSTAPPF 230kV - Section 2F & 1F	P2	Bus/Breaker	<100	100	102	<100	41	63	<100	13	103	20	<100	110	121	Under review for potential modeling issues
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	C.COSTAPPF 230kV Section 1F	P2	Bus/Breaker	<100	100	103	<100	42	63	<100	14	103	20	<100	111	122	Under review for potential modeling issues
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	COYOTE SW STA (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	76	83	87	37	40	54	37	18	86	18	60	Diverge	103	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	EAST SHORE 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	77	84	88	39	40	55	36	15	87	15	59	Diverge	104	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	LS PSTAS 230kV(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	85	93	97	40	43	59	43	18	96	19	70	105	115	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	MONTA VISTA 115KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	75	82	87	38	40	54	39	17	85	17	62	Diverge	103	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	MORAGA 230kV Bus #1 &2(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	96	106	112	49	53	69	53	25	108	26	83	Diverge	133	Project: Moraga 230 kV bus upgrade In-service date: 2024
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	ROSSMOOR 230kV (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	78	85	90	38	41	56	40	18	88	18	64	97	106	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	Contra Costa-Brentwood 230 kV and Contra Costa-Delta Switching Yard 230 kV lines	P7	DCTL	85	89	92	34	35	55	28	10	92	16	57	99	108	Sensitivity only



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	Contra Costa-Moraga Nos. 1 & 2 230 kV lines	P7	DCTL	90	98	105	47	50	66	48	23	101	24	74	Diverge	124	Continue to monitor future load forecast
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	Tesla - Newark No.2 and Metcalf - Los Esteros 230 kV lines	P7	DCTL	83	91	96	42	45	59	47	20	94	19	73	Diverge	113	Sensitivity only
Cayetano-Lone Tree (Lone Tree-USWP) 230kV Line	Tesla-Newark No.1 and Tesla-Ravenswood 230 kV lines	P7	DCTL	86	92	99	46	49	63	55	26	95	24	Diverge	Diverge	117	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	CONTRA COSTA-LAS POSITAS 230kV [4510]	P1	N-1	98	104	104	50	54	72	55	22	100	32	83	107	123	Contra Costa area generation redispatch
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	LAS POSITAS-NEWARK 230kV [4980]	P1	N-1	92	97	97	45	48	66	50	<100	93	30	78	100	114	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	PPASSJCT-NEWARK E #2 230kV [0]	P1	N-1	91	97	97	48	50	66	55	21	93	29	81	100	115	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	ROSSMOOR-MORAGA-C.COSTAPPE 230kV [0]	P1	N-1	89	95	95	47	50	67	51	21	91	30	76	98	113	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	TESLA-NEWARK #1 230kV [5720]	P1	N-1	90	95	96	49	53	68	57	25	92	32	82	100	114	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	C.COSTAPPD Section 1D & C.COSTAPPE Section 1E 230kV	P2	Bus/Breaker	148	Diverge	133	126	125	145	7	10	138	16	53	Diverge	157	Under review for potential modeling issues
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	C.COSTAPPE - 1E 230kV & ROSSMOOR-MORAGA-C.COSTAPPE line	P2	Bus/Breaker	148	129	133	126	125	145	7	10	138	16	53	Diverge	157	Under review for potential modeling issues
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	C.COSTAPPE 230kV Section 1E	P2	Bus/Breaker	148	129	133	126	125	145	7	10	138	16	53	Diverge	157	Under review for potential modeling issues
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	C.COSTAPPE Section 1E & C.COSTAPPF Section 1F 230kV	P2	Bus/Breaker	148	129	133	126	125	145	7	10	139	16	53	Diverge	157	Under review for potential modeling issues
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	C.COSTAPPF 230kV - Section 2F & 1F	P2	Bus/Breaker	106	109	107	48	49	75	43	17	105	32	75	110	127	Under review for potential modeling issues
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	C.COSTAPPF 230kV Section 1F	P2	Bus/Breaker	106	110	108	49	50	75	45	17	105	32	76	111	127	Under review for potential modeling issues
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	COYOTE SW STA (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	87	92	92	46	48	64	47	21	88	30	71	Diverge	108	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	EAST SHORE 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	88	93	93	47	49	65	47	19	89	27	71	Diverge	110	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	LS PSTAS 230kV(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	96	102	102	49	52	70	53	22	98	31	82	105	120	Continue to monitor future load forecast
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	MONTA VISTA 115KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	86	92	92	46	48	64	50	21	88	29	74	Diverge	109	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	MORAGA 230kV Bus #1 &2(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	107	115	117	59	63	82	64	29	111	38	95	Diverge	138	Project: Moraga 230 kV bus upgrade In-service date: 2024 Short term: Generation redispatch
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	ROSSMOOR 230kV (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	89	94	95	46	49	66	50	21	91	30	76	98	112	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	Contra Costa-Brentwood 230 kV and Contra Costa-Delta Switching Yard 230 kV lines	P7	DCTL	96	99	96	42	43	66	39	14	95	28	68	99	114	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	Contra Costa-Moraga Nos. 1 & 2 230 kV lines	P7	DCTL	101	108	109	56	60	79	59	26	104	36	86	Diverge	129	Under review for potential modeling issues
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	Tesla - Newark No.2 and Metcalf - Los Esteros 230 kV lines	P7	DCTL	94	100	101	51	54	69	58	24	96	31	85	Diverge	119	Continue to monitor future load forecast
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	Tesla-Newark No.1 and Tesla-Ravenswood 230 kV lines	P7	DCTL	97	102	104	55	59	74	65	30	98	36	Diverge	Diverge	123	Sensitivity only
Cayetano-Lone Tree (USWP-Cayetano) 230kV Line	TESLA-RAVENSWOOD 230KV [5730] & CONTRA COSTA-LAS POSITAS 230kV [4510]	P6	N-1-1	100	100	100	<100	<100	80	<100	<100	100	<100	90	<100	101	Sensitivity only



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				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Christie-Sobrante (Oleum-Sobrante) 115kV Line	Sobrante-G Nos. 1 & 2 115 kV lines	P7	DCTL	109	79	85	86	54	58	102	35	79	31	115	85	130	Project: Christie-Sobrante 115 kV reconductor project. In-service date: 12/22 Short term: Operating solution
Christie-Sobrante (Oleum-Sobrante) 115kV Line	SOBRANTE-G #1 115kV [3720] & SOBRANTE-G #2 115kV [3730]	P6	N-1-1	105	79	84	86	<100	<100	100	<100	79	<100	100	<100	<100	Project: Christie-Sobrante 115 kV reconductor project. In-service date: 12/22 Short term: Operating solution
Claremont-East Portal 115kV section	SOBRANTE 115kV - Section 2E & 1E	P2	Bus/Breaker	<100	101	100	<100	66	74	<100	33	101	26	<100	101	100	Under review for potential modeling issues
Contra Costa-Contra Costa Sub 230kV Line	BIRDS LANDING SW STA-CONTRA COSTA PP 230kV [5830]	P1	N-1	47	60	55	8	9	8	74	35	50	65	108	64	56	Sensitivity only
Contra Costa-Contra Costa Sub 230kV Line	C.COSTAPPD - 1D 230kV & MARSHLD1-C.COSTAPPD #1 line	P2	Bus/Breaker	89	102	98	2	3	37	67	32	92	62	98	Diverge	98	Under review for potential modeling issues
Contra Costa-Contra Costa Sub 230kV Line	C.COSTAPPD 230kV Section 1D	P2	Bus/Breaker	89	102	98	2	3	37	67	32	92	62	98	Diverge	98	Under review for potential modeling issues
Contra Costa-Contra Costa Sub 230kV Line	C.COSTAPPD 230kV Section 2D	P2	Bus/Breaker	59	73	69	8	9	5	74	35	63	65	108	77	69	Under review for potential modeling issues
Contra Costa-Contra Costa Sub 230kV Line	C.COSTAPPD Section 2D & C.COSTAPPE Section 2E 230kV	P2	Bus/Breaker	50	<100	<100	14	<100	<100	69	<100	<100	<100	100	<100	<100	Under review for potential modeling issues
Contra Costa-Las Positas 230kV Line	C.COSTAPPE - 1E 230kV & ROSSMOOR-MORAGA-C.COSTAPPE line	P2	Bus/Breaker	98	106	106	38	39	67	50	21	101	35	73	Diverge	106	Under review for potential modeling issues
Contra Costa-Las Positas 230kV Line	C.COSTAPPE 230kV - Section 2E & 1E	P2	Bus/Breaker	104	112	112	43	44	73	50	21	107	35	76	Diverge	112	Under review for potential modeling issues
Contra Costa-Las Positas 230kV Line	C.COSTAPPE 230kV Section 1E	P2	Bus/Breaker	<100	106	106	<100	39	67	<100	21	101	35	<100	Diverge	106	Under review for potential modeling issues
Contra Costa-Las Positas 230kV Line	C.COSTAPPE Section 1E & C.COSTAPPF Section 1F 230kV	P2	Bus/Breaker	<100	106	106	<100	39	67	<100	21	101	35	<100	Diverge	106	Under review for potential modeling issues
Eastshore 230/115kV Transformer #1	E. SHORE 230kV - Middle Breaker Bay 3	P2	Bus/Breaker	100	<100	<100	85	<100	<100	23	<100	<100	<100	34	<100	<100	Project: East Shore 230 kV Bus Terminals Reconfiguration In-service date: 2024 Short term: Operating solution
Eastshore-San Mateo 230kV Line	RAVENSWOOD 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	74	75	77	65	62	66	39	37	75	37	Diverge	Diverge	77	Sensitivity only
El Patio-San Jose Sta. 'A' 115 kV Line	Metcalf - Evergreen #1 and #2 115 kV Lines	P7	DCTL	79	89	100	65	73	79	60	51	91	44	88	112	100	Sensitivity only
El Patio-San Jose Sta. 'A' 115 kV Line	Metcalf - Evergreen #1 and #2 115 kV Lines	P7	DCTL	79	89	100	65	73	79	60	51	91	44	88	112	100	Sensitivity only
Evergreen-Almaden 60 kV Line	Normal	P0	N-0	84	84	97	46	46	49	66	40	84	36	61	99	116	Sensitivity only
Evergreen-Almaden 60 kV Line	MONTA VISTA-LOS GATOS 60kV [7610]	P1	N-1	114	119	137	75	74	83	95	61	120	56	83	140	162	Disable automatic
Grant-Eastshore #1 115kV Line	EASTSHORE-SAN MATEO 230kV [4650]	P1	N-1	31	40	45	22	46	46	21	11	40	7	26	45	117	Sensitivity only
Grant-Eastshore #1 115kV Line	GRANT-EASTSHORE #2 115kV [1701]	P1	N-1	62	38	55	44	55	56	42	21	39	12	51	58	144	Sensitivity only
Grant-Oakland J 115 kV Line	MORAGA.E 115kV - Section 2E & 1E	P2	Bus/Breaker	<100	117	126	<100	81	85	<100	57	118	53	<100	126	192	Under review for potential modeling issues
Jefferson-Hillsdale JCT 60kV Line	JEFFERSON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	139	145	159	133	135	158	131	66	147	59	105	160	187	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
Jefferson-Hillsdale JCT 60kV Line	JEFFERSON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	142	147	162	135	137	160	131	67	149	60	107	164	191	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution



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				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Jefferson-Hillsdale JCT 60kV Line	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	142	49	50	135	47	46	132	32	50	26	107	51	59	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
Kifer-FMC 115 kV Line	NRS 400 115 kV bus tie breaker to NRS 300 115 kV bus	P2	Bus/Breaker	73	73	79	67	69	73	14	22	73	20	76	Diverge	94	Project: SVP breaker upgrade project
Lakewood Bus Tie	LMEC 115kV - Section 2E & 1E	P2	Bus/Breaker	101	97	145	58	58	71	60	26	98	22	73	Diverge	145	Under review for potential modeling issues
Lakewood Bus Tie	MARTNZ E - 1E 115kV & PITTSBURG-MARTINEZ #2 line	P2	Bus/Breaker	101	97	145	58	58	71	60	26	98	22	73	Diverge	145	Under review for potential modeling issues
Lakewood Bus Tie	PITTSBURG 115kV - Section 2E & 2D	P2	Bus/Breaker	101	97	145	58	58	71	60	26	98	22	73	Diverge	145	Under review for potential modeling issues
Lakewood Bus Tie	PITTSBURG 115kV Section 2E	P2	Bus/Breaker	101	97	145	58	58	71	60	26	98	22	73	Diverge	145	Under review for potential modeling issues
Lakewood-Clayton 115kV Line	LMEC 115kV - Section 2E & 1E	P2	Bus/Breaker	101	93	136	55	54	70	57	8	94	7	72	Diverge	136	Under review for potential modeling issues
Lakewood-Clayton 115kV Line	MARTNZ E - 1E 115kV & PITTSBURG-MARTINEZ #2 line	P2	Bus/Breaker	101	94	136	55	54	70	57	8	94	7	72	Diverge	136	Under review for potential modeling issues
Lakewood-Clayton 115kV Line	PITTSBURG 115kV - Section 2E & 2D	P2	Bus/Breaker	101	93	136	55	54	70	57	8	94	7	72	Diverge	136	Under review for potential modeling issues
Lakewood-Clayton 115kV Line	PITTSBURG 115kV Section 2E	P2	Bus/Breaker	101	93	136	55	54	70	57	8	94	7	72	Diverge	136	Under review for potential modeling issues
Lakewood-Meadow Lane-Clayton 115kV Line	CLAYTON-MEADOW LANE 115kV [1270] & LAKEWOOD-CLAYTON 115kV [2082]	P6	N-1-1	100	100	103	76	75	74	75	<100	100	<100	81	<100	78	Existing Pittsburg-Lakewood RAS
Las Positas-Newark 230kV Line	C.COSTAPPE - 1E 230kV & ROSSMOOR-MORAGA-C.COSTAPPE line	P2	Bus/Breaker	131	144	141	20	22	58	52	27	135	52	98	Diverge	141	Under review for potential modeling issues
Las Positas-Newark 230kV Line	C.COSTAPPE 230kV - Section 2E & 1E	P2	Bus/Breaker	143	155	152	27	29	67	52	27	147	52	103	Diverge	152	Under review for potential modeling issues
Las Positas-Newark 230kV Line	C.COSTAPPE 230kV Section 1E	P2	Bus/Breaker	130	144	141	20	22	58	52	27	135	52	98	Diverge	141	Under review for potential modeling issues
Las Positas-Newark 230kV Line	C.COSTAPPE Section 1E & C.COSTAPPF Section 1F 230kV	P2	Bus/Breaker	130	144	141	20	22	58	52	27	135	52	98	Diverge	141	Under review for potential modeling issues
Las Positas-Newark 230kV Line	C.COSTAPPE Section 2E & C.COSTAPPF Section 2F 230kV	P2	Bus/Breaker	110	119	117	31	33	57	38	25	116	39	86	Diverge	117	Under review for potential modeling issues
Las Positas-Newark 230kV Line	C.COSTAPPF 230kV Section 1F	P2	Bus/Breaker	100	105	102	22	23	47	24	20	102	35	69	107	102	Under review for potential modeling issues
Las Positas-Newark 230kV Line	MORAGA 230kV Bus #1 &2(Failure of Non-Redundent Relay)	P5	Non-Redundent Relay	100	111	113	31	35	54	48	30	108	42	93	Diverge	113	Project: Moraga 230 kV bus upgrade In-service date: 2024
Las Positas-Newark 230kV Line	Contra Costa-Moraga Nos. 1 & 2 230 kV lines	P7	DCTL	92	102	103	29	32	50	43	28	99	40	82	Diverge	103	Contra Coasta area generation redispatch
Los Esteros-Nortech 115 kV Line	SSS 230/230kV TB 1	P1	N-1	99	98	102	64	64	64	42	27	97	26	76	124	102	Sensitivity only
Los Esteros-Nortech 115 kV Line	SSS-NRS 230 kV same as outage of SVP's PST or NRS T2	P1	N-1	100	98	102	65	64	64	42	25	97	24	76	125	102	Continue to monitor future load forecast
Los Esteros-Nortech 115 kV Line	LS ESTRS 230kV - Middle Breaker Bay 8	P2	Bus/Breaker	99	98	102	64	64	64	42	27	97	26	76	124	102	Sensitivity only
Los Esteros-Nortech 115 kV Line	NRS 400 115 kV bus	P2	Bus/Breaker	106	107	111	67	67	68	44	26	106	25	84	139	111	Project: SVP breaker upgrade project
Los Esteros-Nortech 115 kV Line	Los Esteros - Trimble & Los Esteros - Montague 115 kV	P7	DCTL	85	84	88	45	44	45	17	25	82	26	52	110	89	Sensitivity only
Los Esteros-Silicon Switching Station 230 kV Line	LOS ESTEROS 115KV BAAH BUS #2 (Failure of Non-Redundent Relay)	P5	Non-Redundent Relay	96	94	97	90	88	88	88	80	96	79	94	Diverge	4	Sensitivity only
Los Esteros-Silicon Switching Station 230 kV Line	PALO ALTO SW. STA. 115KV DBDB BUS #1 (Failure of Non-Redundent Relay)	P5	Non-Redundent Relay	98	102	105	92	94	94	91	84	103	84	96	Diverge	4	Protection upgrade
Loyola-Monta Vista 60 kV Line	Normal	P0	N-0	84	96	94	65	64	63	82	39	97	35	57	94	113	Sensitivity only
Martinez-Oleum 115kV Line	SOBRANTE 115kV - Section 2E & 1E	P2	Bus/Breaker	<100	83	106	<100	78	86	<100	30	83	25	<100	109	106	Under review for potential modeling issues



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Metcalf 230/115 kV Trans No. 1	METCALF 230kV - Section 2D & 2E	P2	Bus/Breaker	97	98	116	83	83	78	110	33	102	22	113	119	5	Continue to monitor future load forecast
Metcalf 230/115 kV Trans No. 2	METCALF 230kV - Section 1D & 1E	P2	Bus/Breaker	92	92	108	80	78	73	98	32	95	23	97	Diverge	5	Continue to monitor future load forecast
Metcalf 230/115 kV Trans No. 3	METCALF 230kV - Section 2D & 2E	P2	Bus/Breaker	96	97	115	83	82	77	108	32	101	22	112	118	5	Continue to monitor future load forecast
Metcalf 230/115 kV Trans No. 4	METCALF 230kV - Section 1D & 1E	P2	Bus/Breaker	92	93	109	80	78	73	100	32	96	23	98	Diverge	5	Continue to monitor future load forecast
Metcalf-El Patio No. 1 115 kV Line	MTCALF D Section 2D & MTCALF E Section 2E 115kV	P2	Bus/Breaker	80	86	96	58	63	66	61	44	88	38	81	104	95	Sensitivity only
Metcalf-El Patio No. 1 115 kV Line	MTCALF D Section 2D & MTCALF E Section 2E 115kV	P2	Bus/Breaker	80	86	96	58	63	66	61	44	88	38	81	104	95	Sensitivity only
Metcalf-El Patio No. 2 115 kV Line	MTCALF D Section 1D & MTCALF E Section 1E 115kV	P2	Bus/Breaker	79	85	94	59	64	67	61	44	87	39	81	103	94	Sensitivity only
Metcalf-El Patio No. 2 115 kV Line	MTCALF D Section 1D & MTCALF E Section 1E 115kV	P2	Bus/Breaker	79	85	94	58	62	66	61	44	87	39	81	103	94	Sensitivity only
Monta Vista 230/115 kV Trans No. 2	MONTAVIS - 2E 230kV & MONTA VISTA-JEFFERSON #2 line	P2	Bus/Breaker	82	92	112	77	82	83	78	65	91	60	88	115	5	Under review for potential modeling issues
Monta Vista 230/115 kV Trans No. 2	MONTAVIS 230kV - Section 1E & 2E	P2	Bus/Breaker	90	99	113	86	94	94	88	71	100	65	98	Diverge	5	Under review for potential modeling issues
Monta Vista 230/115 kV Trans No. 2	MONTAVIS 230kV Section 2E	P2	Bus/Breaker	82	92	112	77	82	83	78	65	91	60	88	115	5	Under review for potential modeling issues
Monta Vista-Wolfe 115 kV Line	STELLING-MONTA VISTA 115kV [1000]	P1	N-1	89	99	112	56	60	67	77	37	99	31	63	112	112	Continue to monitor future load forecast
Moraga 230/115kV Transformer #1	MORAGA.D Section 2D & MORAGA.E Section 2E 115kV	P2	Bus/Breaker	<100	92	111	<100	79	88	<100	64	96	62	<100	111	5	Continue to monitor future load forecast
Moraga 230/115kV Transformer #3	MORAGA 230kV - Section 2D & 2E	P2	Bus/Breaker	<100	96	112	<100	83	90	<100	51	96	51	<100	113	4	Continue to monitor future load forecast
Moraga 230/115kV Transformer #3	MORAGA 230kV Section 2D	P2	Bus/Breaker	94	97	118	85	90	98	92	58	98	56	96	118	5	Continue to monitor future load forecast
Moraga-Claremont #1 115kV Line	SOBRANTE 115kV - Section 2E & 1E	P2	Bus/Breaker	110	105	72	104	117	65	128	61	105	54	104	72	174	Under review for potential modeling issues
Moraga-Claremont #2 115kV Line	SOBRANTE 115kV - Section 2E & 1E	P2	Bus/Breaker	110	105	72	104	118	65	129	61	105	54	104	72	174	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	CLAYTN 115kV - Section 2D & 1D	P2	Bus/Breaker	111	111	128	59	60	59	79	59	112	52	98	129	128	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	CLAYTN 115kV Section 2D	P2	Bus/Breaker	<100	62	128	<100	16	17	<100	31	62	29	<100	130	128	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	LMEC 115kV - Section 2E & 1E	P2	Bus/Breaker	278	267	403	124	123	150	168	72	269	62	210	Diverge	403	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBG D 230kV - Section 2D & 1D	P2	Bus/Breaker	56	60	64	10	7	12	17	69	62	58	185	Diverge	64	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBG D 230kV Section 1D	P2	Bus/Breaker	19	19	19	48	34	49	65	101	16	92	Diverge	14	19	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBG D Section 1D & PITSBG E Section 1E 230kV	P2	Bus/Breaker	19	20	18	48	34	49	66	101	17	91	Diverge	13	18	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBURG 115kV - Section 2E & 2D	P2	Bus/Breaker	278	267	403	124	123	150	168	72	269	62	210	Diverge	403	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBURG 115kV Section 2E	P2	Bus/Breaker	278	267	403	124	123	150	168	72	269	62	210	Diverge	403	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	CLAYTN 115kV - Section 2D & 1D	P2	Bus/Breaker	112	<100	<100	60	<100	<100	80	<100	<100	<100	99	<100	<100	Under review for potential modeling issues



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Moraga-Lakewood 115kV Line (Lakewood Reactors)	LMEC 115kV - Section 2E & 1E	P2	Bus/Breaker	278	<100	<100	124	<100	<100	168	<100	<100	<100	210	<100	<100	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBURG 115kV - Section 2E & 2D	P2	Bus/Breaker	278	<100	<100	124	<100	<100	168	<100	<100	<100	210	<100	<100	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBURG 115kV Section 2E	P2	Bus/Breaker	278	<100	<100	124	<100	<100	168	<100	<100	<100	210	<100	<100	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	CLAYTN 115kV - Section 2D & 1D	P2	Bus/Breaker	<100	111	128	<100	60	59	<100	59	112	52	<100	129	128	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	CLAYTN 115kV Section 2D	P2	Bus/Breaker	<100	62	128	<100	16	17	<100	31	62	30	<100	130	128	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	LMEC 115kV - Section 2E & 1E	P2	Bus/Breaker	<100	267	403	<100	123	150	<100	73	269	62	<100	Diverge	403	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBURG 115kV - Section 2E & 2D	P2	Bus/Breaker	<100	267	403	<100	123	150	<100	73	269	62	<100	Diverge	403	Under review for potential modeling issues
Moraga-Lakewood 115kV Line (Lakewood Reactors)	PITSBURG 115kV Section 2E	P2	Bus/Breaker	<100	267	403	<100	123	150	<100	73	269	62	<100	Diverge	403	Under review for potential modeling issues
Moraga-Oakland J 115kV Line	SN LNDRO 115kV - Section 1E & 2E	P2	Bus/Breaker	132	<100	<100	95	<100	<100	90	<100	<100	<100	114	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-Oakland J 115kV Line	EASTSHRE 115kV - Section 1D & 1E	P2	Bus/Breaker	<100	95	99	<100	60	67	<100	28	93	28	<100	Diverge	117	Sensitivity only
Moraga-Oakland J 115kV Line	EAST SHORE 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<100	95	99	<100	60	67	<100	28	93	29	<100	Diverge	117	Sensitivity only
Moraga-Oakland J 115kV Line	STATIN J-EDES-GRANT 115kV [0] & SAN LEANDRO-OAKLND J #1 115kV [3520]	P6	N-1-1	94	133	148	88	124	135	98	75	133	71	99	<100	175	Under review for potential modeling issues
Moraga-San Leandro #1 115kV Line	MORAGA 115kV - Section 2D & 2E	P2	Bus/Breaker	126	<100	<100	106	<100	<100	101	<100	<100	<100	112	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-San Leandro #1 115kV Line	MORAGA 115kV Section 2E	P2	Bus/Breaker	128	<100	<100	106	<100	<100	102	<100	<100	<100	113	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-San Leandro #1 115kV Line	EASTSHRE 115kV - Section 1D & 1E	P2	Bus/Breaker	<100	86	91	<100	55	61	<100	26	85	25	<100	Diverge	108	Sensitivity only
Moraga-San Leandro #1 115kV Line	MORAGA.E 115kV Section 2E	P2	Bus/Breaker	<100	90	86	<100	46	50	<100	36	88	38	<100	90	102	Sensitivity only
Moraga-San Leandro #1 115kV Line	EAST SHORE 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<100	86	91	<100	55	60	<100	26	85	25	<100	Diverge	108	Sensitivity only
Moraga-San Leandro #1 115kV Line	Moraga-Oakland J 115 kV and Moraga-San Leandro No. 3 115 kV lines	P7	DCTL	133	<100	<100	111	<100	<100	107	<100	<100	<100	118	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-San Leandro #2 115kV Line	MORAGA 115kV - Section 1D & 1E	P2	Bus/Breaker	153	<100	<100	123	<100	<100	119	<100	<100	<100	135	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-San Leandro #2 115kV Line	SN LNDRO 115kV Section 1E	P2	Bus/Breaker	146	117	115	119	61	67	114	44	115	46	129	119	136	Under review for potential modeling issues
Moraga-San Leandro #2 115kV Line	EASTSHRE 115kV - Section 1D & 1E	P2	Bus/Breaker	<100	87	92	<100	56	61	<100	26	86	26	<100	Diverge	109	Sensitivity only



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Moraga-San Leandro #2 115kV Line	EAST SHORE 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<100	87	92	<100	55	61	<100	26	86	26	<100	Diverge	109	Sensitivity only
Moraga-San Leandro #2 115kV Line	Moraga-Oakland J 115 kV and Moraga-San Leandro No. 3 115 kV lines	P7	DCTL	135	<100	<100	112	<100	<100	108	<100	<100	<100	119	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-San Leandro #3 115kV Line	MORAGA 115kV - Section 2D & 2E	P2	Bus/Breaker	108	<100	<100	92	<100	<100	87	<100	<100	<100	96	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-San Leandro #3 115kV Line	MORAGA 115kV Section 2E	P2	Bus/Breaker	110	<100	<100	92	<100	<100	88	<100	<100	<100	97	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-San Leandro #3 115kV Line	Moraga-San Leandro Nos. 1 & 2 115 kV lines	P7	DCTL	121	<100	<100	100	<100	<100	95	<100	<100	<100	107	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Moraga-San Leandro #3 115kV Line	MORAGA-SAN LEANDRO #1 115kV [2770] & MORAGA-SAN LEANDRO #2 115kV [2780]	P6	N-1-1	121	<100	<100	100	<100	<100	95	<100	<100	<100	107	<100	<100	Project: East Shore-Oakland J 115 kV Reconductoring Project In-service date: 6/22 Short term: Operating solution
Mountain View-Monta Vista 115 kV Line	LMECCT2 18.00kV & LMECCT1 18.00kV & LMECST1 18.00kV Gen Units & WHISMAN-MTN VIEW 115kV [4150]	P3	G-1/N-1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	109	Sensitivity only
Mountain View-Monta Vista 115 kV Line	JEFFERSON-MARTIN 230KV [5710] (2) & WHISMAN-MTN VIEW 115kV [4150]	P6	N-1-1	<100	74	87	76	79	74	80	82	78	<100	92	<100	113	Sensitivity only
Newark 230/115kV Transformer #11	NEWARK D Section 1D & NEWARK E Section 1E 230kV	P2	Bus/Breaker	105	<100	<100	60	<100	<100	81	<100	<100	<100	104	<100	<100	Project: Newark 230/115 kV Transformer Bank #7 Circuit Breaker Addition In-service date: 2024 Short term: Operating solution
Newark 230/115kV Transformer #11	NEWARK D Section 1D & NEWARK E Section 1E 230kV	P2	Bus/Breaker	103	<100	<100	60	<100	<100	80	<100	<100	<100	103	<100	<100	Project: Newark 230/115 kV Transformer Bank #7 Circuit Breaker Addition In-service date: 2024 Short term: Operating solution
Newark-Ames #1 115kV Line	MONTA VISTA 115KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	79	82	86	68	70	73	80	55	83	52	71	Diverge	102	Sensitivity only
Newark-Ames #1 115kV Line	TESLA-RAVENSWOOD 230KV [5730] & NEWARK-RAVENSWOOD 230kV [5936]	P6	N-1-1	81	79	82	<100	<100	<100	89	<100	78	<100	89	<100	104	Sensitivity only
Newark-Ames #3 115kV Line	MONTAVIS 230kV - Section 2E & 2D	P2	Bus/Breaker	<100	84	88	<100	71	74	<100	59	85	56	<100	Diverge	104	Under review for potential modeling issues
Newark-Ames #3 115kV Line	MONTA VISTA 115KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	86	89	94	74	77	79	87	60	91	57	78	Diverge	111	Sensitivity only
Newark-Ames #3 115kV Line	Newark-Ravenswood 230 kV and Tesla-Ravenswood 230 kV lines	P7	DCTL	86	84	92	71	71	75	97	59	83	57	Diverge	Diverge	108	Sensitivity only
Newark-Ames #3 115kV Line	TESLA-RAVENSWOOD 230KV [5730] & NEWARK-RAVENSWOOD 230kV [5936]	P6	N-1-1	88	86	89	74	72	75	97	<100	85	<100	97	<100	113	Sensitivity only
Newark-Ames Dist 115kV Line	MONTAVIS 230kV - Section 2E & 2D	P2	Bus/Breaker	<100	85	89	<100	72	74	<100	59	86	56	<100	Diverge	105	Under review for potential modeling issues
Newark-Ames Dist 115kV Line	MONTA VISTA 115KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	87	90	95	75	78	80	88	61	92	57	79	Diverge	112	Sensitivity only
Newark-Ames Dist 115kV Line	Newark-Ravenswood 230 kV and Tesla-Ravenswood 230 kV lines	P7	DCTL	87	85	92	72	73	76	98	59	84	58	Diverge	Diverge	109	Sensitivity only
Newark-Ames Dist 115kV Line	TESLA-RAVENSWOOD 230KV [5730] & NEWARK-RAVENSWOOD 230kV [5936]	P6	N-1-1	89	87	90	75	73	76	98	<100	86	<100	98	<100	114	Sensitivity only



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Newark-Dixon Landing 115kV Line	MCKEE-PIERCY 115kV [2379]	P1	N-1	<100	62	70	<100	39	43	<100	18	62	14	<100	71	102	Sensitivity only
Newark-Dixon Landing 115kV Line	PIERCY-METCALF 115kV [4318]	P1	N-1	<100	77	88	<100	49	53	<100	21	77	16	<100	90	129	Sensitivity only
Newark-Dixon Landing 115kV Line	MTCALF D Section 2D & MTCALF E Section 2E 115kV	P2	Bus/Breaker	75	77	89	49	49	53	57	21	77	16	57	90	130	Sensitivity only
Newark-Dixon Landing 115kV Line	MTCALF E 115kV Section 2E	P2	Bus/Breaker	75	77	89	49	49	53	57	21	77	16	57	90	129	Sensitivity only
Newark-Dixon Landing 115kV Line	PIERCY 115kV Section 1D	P2	Bus/Breaker	<100	62	70	<100	39	43	<100	18	62	14	<100	71	102	Sensitivity only
Newark-Dixon Landing 115kV Line	McKee - Piercy & Milpitas - Swift 115 kV Lines	P7	DCTL	62	62	70	39	39	43	47	18	62	14	48	71	102	Sensitivity only
Newark-Dixon Landing 115kV Line	Swift - Metcalf & Piercy - Metcalf 115 kV Lines	P7	DCTL	75	77	89	49	49	53	57	21	77	16	57	91	130	Sensitivity only
Newark-Dixon Landing 115kV Line	LECEFGT1 13.80kV & LECEFGT2 13.80kV & LECEFGT3 13.80kV & LECEFGT4 13.80kV Gen Units & PIERCY-METCALF 115kV [4318]	P3	G-1/N-1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	131	Sensitivity only
Newark-Dixon Landing 115kV Line	POTRERO-TBC_POT1 #1 115KV [0] & PIERCY-METCALF 115kV [4318]	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	130	Sensitivity only
Newark-Kifer 115kV Line	NRS 400 115 kV bus tie breaker to NRS 300 115 kV bus	P2	Bus/Breaker	98	99	110	59	58	63	31	15	97	16	101	Diverge	130	Project: SVP breaker upgrade project
Newark-Kifer 115kV Line	NRS 400 115 kV bus tie breaker to NRS 300 115 kV bus	P2	Bus/Breaker	100	101	112	60	59	65	32	17	99	18	103	Diverge	132	Project: SVP breaker upgrade project
Newark-Kifer 115kV Line	LOS ESTEROS 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	58	68	76	29	36	40	35	23	67	23	81	101	90	Sensitivity only
Newark-Lawrence 115kV Line	MONTAVIS 230kV - Section 2E & 2D	P2	Bus/Breaker	<100	92	102	<100	62	66	<100	52	92	50	<100	Diverge	102	Under review for potential modeling issues
Newark-Lawrence 115kV Line	Newark-Applied Materials & Lawrence-Monta Vista 115 kV Lines	P7	DCTL	94	96	102	59	60	64	77	57	96	56	94	104	102	Continue to monitor future load forecast
Newark-Northern Receiving Station #1 115kV Line	LOS ESTEROS 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	83	97	103	41	49	55	57	37	95	39	105	131	122	Continue to monitor future load forecast
Newark-Northern Receiving Station #1 115kV Line	LOS ESTEROS 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	75	89	97	32	40	46	48	29	87	34	102	Diverge	115	Sensitivity only
Newark-Northern Receiving Station #1 115kV Line	PALO ALTO SW. STA. 115KV DBDB BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	60	76	85	23	31	39	6	14	72	12	51	Diverge	101	Sensitivity only
Newark-Northern Receiving Station #1 115kV Line	Newark - Los Esteros & Los Esteros - Metcalf 230 kV Lines	P7	DCTL	75	89	97	32	40	46	48	29	87	34	102	Diverge	115	Sensitivity only
Newark-Northern Receiving Station #2 115kV Line	NRS 400 115 kV bus tie breaker to NRS 300 115 kV bus	P2	Bus/Breaker	86	106	107	58	69	68	33	29	104	29	88	Diverge	126	Project: SVP breaker upgrade project
Newark-Northern Receiving Station #2 115kV Line	LOS ESTEROS 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	64	78	86	30	40	45	44	30	77	30	96	113	102	Sensitivity only
Newark-Northern Receiving Station #2 115kV Line	LOS ESTEROS 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	56	70	80	22	32	36	36	23	69	25	92	Diverge	95	Sensitivity only
Newark-Northern Receiving Station #2 115kV Line	Newark - Los Esteros & Los Esteros - Metcalf 230 kV Lines	P7	DCTL	56	70	80	22	32	36	36	23	69	25	92	Diverge	95	Sensitivity only
Newark-Trimble 115kV Line	LOS ESTEROS 115KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	71	78	88	34	35	41	44	20	76	21	66	Diverge	104	Sensitivity only
Newark-Trimble 115kV Line	LOS ESTEROS 115KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	71	78	88	34	35	41	44	20	76	21	66	Diverge	104	Sensitivity only
Nortech-NRS 115 kV Line	SSS 230/230kV TB 1	P1	N-1	85	83	85	66	65	64	31	22	82	21	61	107	85	Sensitivity only
Nortech-NRS 115 kV Line	SSS-NRS 230 kV same as outage of SVP's PST or NRS T2	P1	N-1	86	83	85	66	65	64	30	19	82	18	61	108	85	Sensitivity only



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Nortech-NRS 115 kV Line	LS ESTRS 230kV - Middle Breaker Bay 8	P2	Bus/Breaker	85	83	85	66	65	64	31	22	82	21	61	107	85	Sensitivity only
Nortech-NRS 115 kV Line	NRS 400 115 kV bus	P2	Bus/Breaker	92	93	94	69	69	69	32	19	91	18	69	122	94	Sensitivity only
North Dublin-Cayetano 230kV Cable	CONTRA COSTA-LAS POSITAS 230kV [4510]	P1	N-1	93	99	98	47	50	67	51	23	95	32	80	102	98	Sensitivity only
North Dublin-Cayetano 230kV Cable	C.COSTAPPD Section 1D & C.COSTAPPE Section 1E 230kV	P2	Bus/Breaker	144	Diverge	128	122	121	140	11	15	134	19	51	Diverge	128	Under review for potential modeling issues
North Dublin-Cayetano 230kV Cable	C.COSTAPPE - 1E 230kV & ROSSMOOR-MORAGA-C.COSTAPPE line	P2	Bus/Breaker	143	125	127	122	121	140	11	15	134	19	51	Diverge	128	Under review for potential modeling issues
North Dublin-Cayetano 230kV Cable	C.COSTAPPE 230kV Section 1E	P2	Bus/Breaker	143	125	127	122	121	140	11	15	134	19	51	Diverge	128	Under review for potential modeling issues
North Dublin-Cayetano 230kV Cable	C.COSTAPPE Section 1E & C.COSTAPPF Section 1F 230kV	P2	Bus/Breaker	143	125	127	122	121	140	11	15	134	19	51	Diverge	128	Under review for potential modeling issues
North Dublin-Cayetano 230kV Cable	C.COSTAPPF 230kV - Section 2F & 1F	P2	Bus/Breaker	101	104	102	44	46	70	40	18	100	32	72	105	102	Under review for potential modeling issues
North Dublin-Cayetano 230kV Cable	C.COSTAPPF 230kV Section 1F	P2	Bus/Breaker	101	105	102	45	47	71	42	19	101	32	73	105	102	Under review for potential modeling issues
North Dublin-Cayetano 230kV Cable	MORAGA 230kV Bus #1 &2(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	102	111	112	55	59	78	60	29	106	38	92	Diverge	112	Project: Moraga 230 kV bus upgrade In-service date: 2024
North Dublin-Cayetano 230kV Cable	Contra Costa-Moraga Nos. 1 & 2 230 kV lines	P7	DCTL	97	103	104	52	56	74	56	27	99	36	83	Diverge	104	Continue to monitor future load forecast
North Dublin-Vineyard 230 kV Line	CONTRA COSTA-LAS POSITAS 230kV [4510]	P1	N-1	83	88	88	39	42	58	45	24	84	31	72	91	104	Sensitivity only
North Dublin-Vineyard 230 kV Line	C.COSTAPPD Section 1D & C.COSTAPPE Section 1E 230kV	P2	Bus/Breaker	133	Diverge	117	112	111	131	19	23	123	24	49	Diverge	138	Under review for potential modeling issues
North Dublin-Vineyard 230 kV Line	C.COSTAPPE - 1E 230kV & ROSSMOOR-MORAGA-C.COSTAPPE line	P2	Bus/Breaker	133	114	117	112	111	131	19	23	123	24	48	Diverge	138	Under review for potential modeling issues
North Dublin-Vineyard 230 kV Line	C.COSTAPPE 230kV Section 1E	P2	Bus/Breaker	133	114	117	112	111	131	19	23	123	24	48	Diverge	138	Under review for potential modeling issues
North Dublin-Vineyard 230 kV Line	C.COSTAPPE Section 1E & C.COSTAPPF Section 1F 230kV	P2	Bus/Breaker	133	114	117	112	111	131	19	23	123	24	48	Diverge	138	Under review for potential modeling issues
North Dublin-Vineyard 230 kV Line	C.COSTAPPF 230kV - Section 2F & 1F	P2	Bus/Breaker	<100	94	91	<100	38	61	<100	20	89	31	<100	94	108	Sensitivity only
North Dublin-Vineyard 230 kV Line	C.COSTAPPF 230kV Section 1F	P2	Bus/Breaker	<100	94	92	<100	39	61	<100	21	90	31	<100	95	108	Sensitivity only
North Dublin-Vineyard 230 kV Line	LS PSTAS 230kV(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	81	87	85	38	40	57	43	24	82	32	71	89	101	Sensitivity only
North Dublin-Vineyard 230 kV Line	MORAGA 230kV Bus #1 &2(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	92	100	101	47	51	69	54	29	95	37	84	Diverge	119	Project: Moraga 230 kV bus upgrade In-service date: 2024
North Dublin-Vineyard 230 kV Line	Contra Costa-Moraga Nos. 1 & 2 230 kV lines	P7	DCTL	86	92	93	45	48	65	49	27	88	35	75	Diverge	110	Sensitivity only
North Dublin-Vineyard 230 kV Line	Tesla - Newark No.2 and Metcalf - Los Esteros 230 kV lines	P7	DCTL	79	84	84	40	42	56	48	26	81	32	74	Diverge	100	Sensitivity only
North Dublin-Vineyard 230 kV Line	Tesla-Newark No.1 and Tesla-Ravenswood 230 kV lines	P7	DCTL	82	86	88	44	47	61	55	30	82	36	Diverge	Diverge	104	Sensitivity only
Cooley Landing 60 kV Bus Tie	RAVENSWOOD 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	131	129	133	87	95	101	114	91	130	85	Diverge	Diverge	133	Ravenswood 115 kV bus upgrade
NRS 115 kV Bus-Tie	PALO ALTO SW. STA. 115KV DBDB BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	83	99	104	69	79	83	70	64	98	64	78	Diverge	103	Continue to monitor future load forecast
NRS 230/115kV TB 1	LOS ESTEROS 115KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	94	93	95	90	88	87	87	79	95	79	93	Diverge	4	Sensitivity only
NRS 230/115kV TB 1	PALO ALTO SW. STA. 115KV DBDB BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	97	100	102	92	93	93	91	84	101	84	95	Diverge	4	Continue to monitor future load forecast



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Oakland C - Oakland L #1 115kV Cable	CLARMNT 115kV - Section 2D & 1D	P2	Bus/Breaker	107	101	108	109	108	118	95	61	101	59	98	110	108	Project: Oakland Clean Energy Initiative In-service date: 8/22 Short term: Generation
Oakland C - Oakland L #1 115kV Cable	MORAGA 115kV - Section 1D & 2D	P2	Bus/Breaker	71	<100	<100	7	<100	<100	23	<100	<100	<100	103	<100	<100	Sensitivity only
Oakland C - Oakland L #1 115kV Cable	MORAGA.C 115kV - Section 1C & 2C	P2	Bus/Breaker	<100	109	75	<100	58	72	<100	36	110	31	<100	73	75	Under review for potential modeling issues
Oakland C - Oakland L #1 115kV Cable	SOBRANTE 115kV - Section 2E & 1E	P2	Bus/Breaker	120	113	65	77	70	66	75	29	113	23	120	65	65	Under review for potential modeling issues
Oakland C - Oakland L #1 115kV Cable	Moraga-Claremont Nos. 1 & 2 115 kV lines	P7	DCTL	93	85	51	51	48	54	54	26	86	23	101	50	51	Sensitivity only
Oakland C - Oakland L #1 115kV Cable	K-D #1 115kV [9966] & K-D #2 115kV [9967]	P6	N-1-1	<100	101	109	109	108	118	95	<100	101	<100	100	<100	<100	Project: Oakland Clean Energy Initiative In-service date: 8/22 Short term: Generation
Oakland C - Oakland X #2 115kV Cable	CLARMNT 115kV - Section 2D & 1D	P2	Bus/Breaker	39	42	110	94	115	117	85	70	44	68	28	111	110	Project: Oakland Clean Energy Initiative In-service date: 8/22 Short term: Generation
Oakland C - Oakland X #2 115kV Cable	C-X #3 115kV [9925] & D-L #1 115kV [9963]	P6	N-1-1	84	<100	121	94	128	125	85	81	<100	79	86	<100	69	Project: Oakland Clean Energy Initiative In-service date: 8/22 Short term: Generation
Oakland D - Oakland L 115kV Cable	STATIN X 115kV - Section 2D & 1D	P2	Bus/Breaker	32	18	117	87	119	121	81	84	21	81	18	118	117	Project: Oakland Clean Energy Initiative In-service date: 8/22 Short term: Generation
Oakland D - Oakland L 115kV Cable	C-X #3 115kV [9925] & C-X #2 115kV [9962]	P6	N-1-1	<100	<100	109	87	110	113	81	80	<100	78	<100	<100	<100	Project: Oakland Clean Energy Initiative In-service date: 8/22 Short term: Generation
Oleum-Christie 115kV Line	Sobrante-G Nos. 1 & 2 115 kV lines	P7	DCTL	89	101	99	53	61	59	80	45	100	39	110	100	99	Continue to monitor future load forecast
Oleum-Martinez 115kV Line	SOBRANTE 115kV - Section 2E & 1E	P2	Bus/Breaker	<100	83	106	<100	87	95	<100	31	82	25	<100	109	106	Under review for potential modeling issues
Piercy-Metcalf 115 kV Line	NEWARK-DIXON LANDING 115kV [2990]	P1	N-1	74	75	87	49	48	52	57	21	76	16	56	87	117	Sensitivity only
Pittsburg-Clayton #3 115 kV Line	PITTSBURG-CLAYTON #1 115kV [3280] & PITTSBURG-CLAYTON #4 115kV [3291]	P6	N-1-1	89	91	103	73	71	73	<100	<100	92	<100	<100	<100	<100	Existing Pittsburg-Lakewood RAS
Pittsburg-Clayton #4 115kV Line	PITTSBURG-CLAYTON #1 115kV [3280] & PITTSBURG-KIRKER-COLUMBIA STEEL 115kV [3310]	P6	N-1-1	96	98	111	73	71	73	<100	<100	99	<100	<100	<100	<100	Existing Pittsburg-Lakewood RAS
Ravenswood-Bair #1 115kV Line	BAIR-RVNSWD D-LONESTAR 115KV [0] & SAN MATEO-BELMONT 115KV [3570]	P6	N-1-1	<100	88	87	<100	88	92	<100	<100	89	<100	77	<100	117	Sensitivity only
Ravenswood-Cooley Landing #1 115kV Line	RVNSWD E 115KV - SECTION 2E & 1E	P2	Bus/Breaker	112	112	117	99	103	106	102	71	111	67	102	120	152	Ravenswood 115 kV bus upgrade
Ravenswood-Cooley Landing #1 115kV Line	RVNSWD E 115KV SECTION 1X	P2	Bus/Breaker	84	85	92	58	57	66	59	37	82	38	69	96	119	Sensitivity only
Ravenswood-Cooley Landing #2 115kV Line	RAVENSWOOD 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	113	113	120	90	97	110	96	70	114	64	Diverge	Diverge	155	Ravenswood 115 kV bus upgrade
Ravenswood-San Mateo #1 115kV Line	SANMATEO 230KV - SECTION 1D & 1E	P2	Bus/Breaker	97	80	49	85	87	40	81	48	81	44	89	Diverge	106	Sensitivity only
Ravenswood-San Mateo #1 115kV Line	SANMATEO 230KV - SECTION 1E & 2E	P2	Bus/Breaker	77	80	53	73	79	47	89	68	83	59	84	53	116	Sensitivity only
Ravenswood-San Mateo #1 115kV Line	SANMATEO 230KV - SECTION 2D & 1D	P2	Bus/Breaker	83	85	50	75	74	44	72	33	86	31	71	50	109	Sensitivity only
Ravenswood-San Mateo #1 115kV Line	RAVENSWOOD 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	160	161	93	133	141	85	137	97	163	89	Diverge	Diverge	203	Ravenswood 115 kV bus upgrade
Ravenswood-San Mateo #1 115kV Line	RAVENSWOOD 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	61	63	44	57	60	36	85	56	62	49	Diverge	Diverge	96	Sensitivity only
Ravenswood-San Mateo #1 115kV Line	Ravenswood-San Mateo Nos. 1 & 2 230 kV lines	P7	DCTL	69	70	48	66	72	42	87	67	74	57	98	48	105	Sensitivity only



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Ravenswood-San Mateo #1 115kV Line	POTRERO-TBC_POT1 #1 115KV [0] & JEFFERSON-MARTIN 230KV [5710] (2)	P6	N-1-1	<100	72	<100	<100	72	<100	<100	<100	74	<100	98	<100	101	Sensitivity only
San Jose 'B'-Stone-Evergreen 115 kV Line	Metcalf - Evergreen #1 and #2 115 kV Lines	P7	DCTL	83	86	101	45	45	50	65	31	86	27	62	104	101	Continue to monitor future load forecast
San Jose 'B'-Stone-Evergreen 115 kV Line	Metcalf - Evergreen #1 and #2 115 kV Lines	P7	DCTL	80	82	98	45	46	51	62	30	82	26	58	100	98	Sensitivity only
San Jose Sta 'A'-'B' 115 kV Line	Metcalf - Evergreen #1 and #2 115 kV Lines	P7	DCTL	73	84	95	55	63	69	56	49	87	42	85	109	96	Sensitivity only
San Leandro - Oakland J #1 115kV Line	EASTSHRE 115kV - Section 1D & 1E	P2	Bus/Breaker	<100	98	102	<100	60	68	<100	29	96	31	<100	Diverge	121	Continue to monitor future load forecast
San Leandro - Oakland J #1 115kV Line	EAST SHORE 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	55	99	102	52	60	68	51	29	96	31	51	Diverge	121	Continue to monitor future load forecast
San Leandro - Oakland J #1 115kV Line	STATIN J-EDES-GRANT 115kV [0] & MORAGA-OAKLAND J 115kV [2760]	P6	N-1-1	98	97	105	75	88	93	72	<100	100	<100	89	<100	125	Continue to monitor future load forecast
San Mateo-Bair 60kV Line	RAVENSWOOD 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	133	133	137	127	135	127	128	83	134	78	Diverge	Diverge	162	Ravenswood 115 kV bus upgrade
San Mateo-Bair 60kV Line	CLY LND 115/60KV TB 1 & CLY LND2 115/60KV TB 2	P6	N-1-1	<100	121	135	<100	120	126	<100	<100	121	<100	91	<100	93	Operating solution as recommended in 2018-2019 TP.
San Mateo-Bay Meadows #1 115kV Line	SAN MATEO-BAY MEADOWS #2 115KV [3560]	P1	N-1	87	86	93	80	79	80	78	45	87	43	78	94	110	Sensitivity only
San Mateo-Bay Meadows #2 115kV Line	SAN MATEO-BAY MEADOWS #1 115KV [3550]	P1	N-1	87	86	93	80	79	80	78	45	87	43	78	94	110	Sensitivity only
San Mateo-Belmont 115kV Line	RVNSWD D 115KV - SECTION 1D & 2D	P2	Bus/Breaker	106	110	103	93	90	94	79	50	109	47	91	104	103	Ravenswood 115 kV bus upgrade
San Mateo-Belmont 115kV Line	RAVENSWOOD 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	186	188	189	158	166	174	157	104	190	97	Diverge	Diverge	189	Ravenswood 115 kV bus upgrade
San Mateo-Belmont 115kV Line	RAVENSWOOD 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	96	100	98	76	70	77	57	38	96	38	79	Diverge	97	Continue to monitor future load forecast
San Mateo-Belmont 115kV Line	RAVENSWD 230/115KV TB 1 & RAVENSWD 230/115KV TB 2	P6	N-1-1	<100	96	93	<100	81	86	<100	<100	100	<100	88	<100	102	Continue to monitor future load forecast
San Mateo-Hillsdale JCT 60kV Line	MONTAVIS 230kV - Section 1E & 2E	P2	Bus/Breaker	82	83	92	79	81	83	81	37	85	41	77	Diverge	109	Sensitivity only
San Mateo-Hillsdale JCT 60kV Line	JEFFERSON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	160	169	189	159	160	184	159	65	172	70	130	188	224	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
San Mateo-Hillsdale JCT 60kV Line	JEFFERSON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	162	171	192	160	162	186	158	65	173	71	132	191	228	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
San Mateo-Hillsdale JCT 60kV Line	Metcalf-Monta Vista No. 3 & Monta Vista-Coyote Sw. Sta. 230 kV Line	P7	DCTL	82	84	92	79	81	83	82	38	84	41	77	Diverge	109	Sensitivity only
San Mateo-Hillsdale JCT 60kV Line	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	162	69	77	160	69	69	160	27	70	31	132	77	91	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
San Mateo-Hillsdale JCT 60kV Line (Beresford-Hillsdale)	JEFFERSON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	181	189	212	151	152	175	180	73	191	79	149	210	212	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
San Mateo-Hillsdale JCT 60kV Line (Beresford-Hillsdale)	JEFFERSON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	184	191	216	152	154	177	179	73	193	80	152	214	216	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
San Mateo-Hillsdale JCT 60kV Line (Beresford-Hillsdale)	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	184	74	81	153	58	62	181	32	75	36	152	82	81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution



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 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
San Mateo-Hillsdale JCT 60kV Line (Hillsdale-Hillsdale JCT)	JEFFERSON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	174	180	203	171	173	198	173	72	183	79	145	201	203	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
San Mateo-Hillsdale JCT 60kV Line (Hillsdale-Hillsdale JCT)	JEFFERSON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	176	182	207	173	175	200	172	72	184	80	147	205	207	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
San Mateo-Hillsdale JCT 60kV Line (Hillsdale-Hillsdale JCT)	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	176	71	75	173	65	66	174	33	71	38	147	76	75	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
Sobrante-El Cerrito STA G #2 115kV Line	SOBRANTE 115kV - Section 1D & 2D	P2	Bus/Breaker	98	107	112	69	74	77	91	45	107	38	105	113	112	Under review for potential modeling issues
Sobrante-Grizzly-Claremont #1 115kV Line (Hillside-Grizzly JCT)	SOBRANTE 115kV - Section 2E & 1E	P2	Bus/Breaker	129	143	136	81	92	99	115	44	143	33	135	137	136	Under review for potential modeling issues
Sobrante-Moraga 115kV Line	MORAGA 230kV - Section 2D & 1D	P2	Bus/Breaker	101	72	99	94	60	59	106	50	72	51	102	Diverge	99	Project: Moraga 230 kV bus upgrade In-service date: 2024
Sobrante-Moraga 115kV Line	SOBRANTE 230kV - Section 2D & 1D	P2	Bus/Breaker	85	96	111	68	77	86	88	44	95	38	95	112	111	Under review for potential modeling issues
Sobrante-Moraga 115kV Line	MORAGA 230kV Bus #1 &2(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	101	72	99	94	60	59	106	50	71	50	102	Diverge	99	Project: Moraga 230 kV bus upgrade In-service date: 2024
Sobrante-Moraga 115kV Line	SOBRANTE 230kV Bus #1&2(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	85	95	110	68	77	86	88	44	95	38	96	Diverge	110	Under review for potential modeling issues
Swift-Metcalf 115 kV Line	NEWARK E Section 1E & NEWARK F Section 1F 115kV	P2	Bus/Breaker	<100	68	79	<100	45	49	<100	20	68	16	<100	80	102	Sensitivity only
Swift-Metcalf 115 kV Line	NEWARK F - 1F 115kV & NEWARK F-LAWRENCE-LOCKHD 1 line	P2	Bus/Breaker	47	68	79	38	45	49	41	20	68	16	40	80	102	Sensitivity only
Swift-Metcalf 115 kV Line	NEWARK F - 1F 115kV & NEWARK F-ZANKER-KRS line	P2	Bus/Breaker	47	68	79	38	45	49	41	20	68	16	39	80	102	Sensitivity only
Swift-Metcalf 115 kV Line	NEWARK F - 1F 115kV & NEWARK-MILPITAS #1 line	P2	Bus/Breaker	47	68	79	38	45	49	41	20	68	16	39	80	102	Sensitivity only
Swift-Metcalf 115 kV Line	NEWARK F 115kV Section 1F	P2	Bus/Breaker	<100	68	79	<100	45	49	<100	20	68	16	<100	80	102	Sensitivity only
Tesla - Newark 230 kV Line No. 2	Tesla-Newark No.1 and Tesla-Ravenswood 230 kV lines	P7	DCTL	73	74	81	48	49	47	81	32	73	26	Diverge	Diverge	104	Sensitivity only
Tesla - Newark 230 kV Line No. 2	LMECCT2 18.00kV & LMECCT1 18.00kV & LMECST1 18.00kV Gen Units & TESLA-NEWARK #1 230kV [5720]	P3	G-1/N-1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	102	Sensitivity only
Tesla - Newark 230 kV Line No. 2	TESLA-RAVENSWOOD 230KV [5730] & TESLA-NEWARK #1 230kV [5720]	P6	N-1-1	73	76	81	<100	<100	<100	81	<100	74	<100	93	<100	114	Sensitivity only
Vineyard-Newark 230kV Line	C.COSTAPPD Section 1D & C.COSTAPPE Section 1E 230kV	P2	Bus/Breaker	109	Diverge	89	89	88	106	31	23	97	22	40	Diverge	90	Under review for potential modeling issues
Vineyard-Newark 230kV Line	C.COSTAPPE - 1E 230kV & ROSSMOOR-MORAGA-C.COSTAPPE line	P2	Bus/Breaker	109	88	89	89	88	106	31	23	97	22	39	Diverge	90	Under review for potential modeling issues
Vineyard-Newark 230kV Line	C.COSTAPPE 230kV Section 1E	P2	Bus/Breaker	109	88	89	89	88	106	31	23	97	22	39	Diverge	90	Under review for potential modeling issues
Vineyard-Newark 230kV Line	C.COSTAPPE Section 1E & C.COSTAPPF Section 1F 230kV	P2	Bus/Breaker	109	88	89	89	88	106	31	23	97	22	39	Diverge	90	Under review for potential modeling issues
Whisman-Monta Vista 115 kV Line	MONTAVIS 230kV - Section 2E & 2D	P2	Bus/Breaker	<100	73	85	<100	47	55	<100	26	73	22	<100	Diverge	100	Under review for potential modeling issues
Whisman-Monta Vista 115 kV Line	MONTA VISTA 115KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	77	87	98	56	59	67	65	31	87	26	57	Diverge	116	Sensitivity only
Whisman-Monta Vista 115 kV Line	LMECCT2 18.00kV & LMECCT1 18.00kV & LMECST1 18.00kV Gen Units & MTN VIEW-MONTA VISTA 115kV [2920]	P3	G-1/N-1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	103	Sensitivity only
Whisman-Monta Vista 115 kV Line	JEFFERSON-MARTIN 230KV [5710] (2) & MTN VIEW-MONTA VISTA 115kV [2920]	P6	N-1-1	<100	<100	82	72	77	72	78	85	73	<100	90	<100	108	Sensitivity only

Study Area: PG&E Greater Bay Area

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)					Project & Potential Mitigation Solutions
				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
Brokaw&1 60 kV	Normal	P0	N-0	1.00	1.00	0.98	1.02	1.03	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
DCJ 60 kV		P0	N-0	1.00	1.00	0.98	1.02	1.03	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
EVERGREN 60 kV		P0	N-0	1.00	1.00	0.96	1.04	1.04	1.00	1.03	0.99	1.01	0.99	0.98	0.94	0.96	Sensitivity Only
FairView 60 kV		P0	N-0	1.00	0.99	0.98	1.01	1.02	1.01	1.02	1.03	1.01	1.03	0.97	0.95	0.98	Sensitivity Only
Homestea 60 kV		P0	N-0	1.00	0.99	0.98	1.01	1.02	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
JENNINGS 60 kV		P0	N-0	1.00	1.00	0.96	1.04	1.04	1.00	1.03	0.99	1.01	0.99	0.99	0.94	0.96	Sensitivity Only
MABURY 60 kV		P0	N-0	1.00	1.00	0.96	1.04	1.04	1.00	1.03	0.99	1.01	0.99	0.99	0.94	0.96	Sensitivity Only
Mathew 60 kV		P0	N-0	1.00	1.00	0.98	1.02	1.03	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
Memorex 60 kV		P0	N-0	1.00	1.00	0.98	1.02	1.03	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
MORAGA 230 kV		P0	N-0	0.97	0.97	0.96	1.03	1.03	0.99	1.02	1.04	0.99	1.05	0.95	0.95	0.96	Sensitivity Only
Northwes 60 kV		P0	N-0	1.00	0.99	0.98	1.01	1.02	1.01	1.02	1.03	1.01	1.03	0.97	0.95	0.98	Sensitivity Only
Parker 60 kV		P0	N-0	1.00	1.00	0.98	1.02	1.03	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
SENER 60 kV		P0	N-0	1.00	1.00	0.96	1.04	1.04	1.00	1.03	0.99	1.01	0.99	0.98	0.94	0.96	Sensitivity Only
Serra 60 kV		P0	N-0	1.00	0.99	0.98	1.01	1.02	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
Uranium 60 kV		P0	N-0	1.00	1.00	0.98	1.02	1.03	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
Zeno 60 kV		P0	N-0	1.00	0.99	0.98	1.01	1.02	1.01	1.02	1.03	1.01	1.03	0.98	0.95	0.98	Sensitivity Only
ALMADEN 60 kV	MONTA VISTA-LOS GATOS 60kV [7610]	P1	N-1	0.96	0.93	0.87	1.02	1.01	0.95	1.03	1.02	0.94	1.03	0.96	0.86	0.87	Disable automatic
ALMADEN 60 kV	METCALF-EVERGREEN #1 115kV [2520]	P1	N-1	NA	0.97	0.90	NA	1.03	0.97	NA	1.00	0.98	1.01	NA	0.88	0.90	Disable automatic
ALMADEN 60 kV	STONE-EVERGREEN-METCALF 115kV [2530]	P1	N-1	NA	0.97	0.90	NA	1.03	0.97	NA	1.00	0.98	1.01	NA	0.88	0.90	Disable automatic
ALMADEN 60 kV	METCALF SVD=v	P1	N-1	0.97	0.98	0.90	1.03	1.03	0.97	1.02	1.00	0.99	1.01	0.94	0.89	0.90	Sensitivity Only
LOS GATS 60 kV	MONTA VISTA-LOS GATOS 60kV [7610]	P1	N-1	0.95	0.90	0.85	1.00	1.00	0.93	1.03	1.03	0.92	1.04	0.95	0.84	0.85	Disable automatic
MCKEE 115 kV	PIERCY-METCALF 115kV [4318]	P1	N-1	NA	0.96	0.92	NA	1.03	0.97	NA	1.04	0.97	1.04	NA	0.90	0.91	Sensitivity Only
PIERCY 115 kV		P1	N-1	NA	0.96	0.91	NA	1.04	0.97	NA	1.04	0.97	1.05	NA	0.89	0.90	Sensitivity Only
EVRGRN 1 115 kV		P2	Bus/Breaker	0.97	0.96	0.90	1.03	1.02	0.97	1.00	1.04	0.97	0.94	1.05	0.80	0.90	Continue to monitor future load forecast
MABURY 60 kV		P2	Bus/Breaker	0.96	0.95	0.88	1.03	1.03	0.96	1.00	1.00	0.97	0.94	1.00	0.80	0.88	Continue to monitor future load forecast

Study Area: PG&E Greater Bay Area

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)					Project & Potential Mitigation Solutions
				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
MCKEE 115 kV	MTCALF E 115kV - Section 1E & 2E	P2	Bus/Breaker	0.95	0.95	0.90	1.04	1.03	0.96	1.00	1.04	0.96	0.94	1.05	0.82	0.90	Continue to monitor future load forecast
PIERCY 115 kV		P2	Bus/Breaker	0.95	0.95	0.89	1.05	1.04	0.96	1.00	1.04	0.96	0.94	1.05	0.82	0.89	Continue to monitor future load forecast
STONE 115 kV		P2	Bus/Breaker	0.96	0.95	0.89	1.03	1.02	0.97	1.00	1.04	0.97	0.94	1.05	0.80	0.89	Continue to monitor future load forecast
MCKEE 115 kV	MTCALF E 115kV Section 2E	P2	Bus/Breaker	0.96	0.96	0.91	1.05	1.03	0.97	1.01	1.04	0.97	0.96	1.04	0.90	0.91	Sensitivity only
PIERCY 115 kV		P2	Bus/Breaker	0.96	0.96	0.90	1.05	1.04	0.97	1.01	1.04	0.97	0.95	1.05	0.89	0.90	Sensitivity only
PIERCY 115 kV	MTCALF D Section 2D & MTCALF E Section 2E 115kV	P2	Bus/Breaker	0.96	0.96	0.90	1.05	1.04	0.96	1.01	1.04	0.97	0.95	1.04	0.88	0.90	Continue to monitor future load forecast
SANRAMON 230 kV	PITSBG E - 1E 230kV & PITTSBURG-TESLA #1 line	P2	Bus/Breaker	0.98	0.99	0.96	1.04	1.04	0.98	1.02	1.04	1.00	0.87	1.04	0.95	0.96	Sensitivity only
TASSAJAR 230 kV		P2	Bus/Breaker	1.00	1.01	0.98	1.03	1.04	1.00	1.02	1.03	1.02	0.90	1.04	0.97	0.98	Sensitivity only
SANRAMON 230 kV	PITSBG E 230kV Section 1E	P2	Bus/Breaker	0.98	0.99	0.96	1.04	1.04	0.98	1.02	1.04	1.00	0.88	1.04	0.95	0.96	Sensitivity only
STELLING 115 kV	MONTAVIS 230kV - Section 2E & 2D	P2	Bus/Breaker	0.96	0.94	0.90	1.01	1.01	0.96	1.01	1.05	0.95	0.94	1.06	0.75	0.90	Monta Vista 230 kV bus upgrade project
WOLFE 115 kV		P2	Bus/Breaker	0.96	0.94	0.89	1.01	1.01	0.96	1.01	1.05	0.95	0.94	1.06	0.75	0.90	Monta Vista 230 kV bus upgrade project
E. SHORE 230 kV	EAST SHORE 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.94	0.89	0.85	1.04	1.04	0.90	1.01	1.04	0.93	1.05	0.90	0.98	0.85	Continue to monitor future load forecast
CAROLD1 60 kV		P5	Non-Redundent Relay	0.95	0.93	0.90	0.99	0.97	0.90	0.98	1.02	0.93	1.02	0.95	0.90	0.90	Project: Jefferson 230 kV bus upgrade project In-service date: 2024

Study Area: PG&E Greater Bay Area

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)					Project & Potential Mitigation Solutions
				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
CAROLD2 60 kV	JEFFERSON 230 KV BAAH BUS #1 or # 2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.87	0.84	0.81	0.92	0.90	0.80	0.92	0.99	0.84	1.00	0.89	0.81	0.81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
HILDAL47 60 kV		P5	Non-Redundent Relay	0.87	0.85	0.81	0.92	0.90	0.80	0.92	0.99	0.84	1.00	0.89	0.81	0.81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
HILDAL49 60 kV		P5	Non-Redundent Relay	0.95	0.93	0.90	0.98	0.97	0.90	0.98	1.02	0.93	1.02	0.95	0.90	0.90	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
HLLSDLJT 60 kV		P5	Non-Redundent Relay	0.95	0.93	0.91	0.98	0.97	0.90	0.98	1.02	0.93	1.02	0.95	0.90	0.91	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
JEFRSN_D 60 kV		P5	Non-Redundent Relay	0.88	0.86	0.82	0.93	0.91	0.81	0.93	0.99	0.85	1.00	0.90	0.82	0.82	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
JEFRSN_E 60 kV		P5	Non-Redundent Relay	0.88	0.86	0.83	0.93	0.91	0.81	0.93	0.99	0.85	1.00	0.90	0.82	0.83	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
LSPLGS&1 60 kV		P5	Non-Redundent Relay	0.87	0.84	0.81	0.91	0.90	0.79	0.92	0.99	0.84	0.99	0.89	0.80	0.81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
LSPLGSJT 60 kV		P5	Non-Redundent Relay	0.87	0.85	0.81	0.92	0.90	0.80	0.92	0.99	0.84	1.00	0.89	0.81	0.81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
MLLBTP97 60 kV		P5	Non-Redundent Relay	0.95	0.93	0.90	0.99	0.97	0.90	0.98	1.02	0.93	1.02	0.95	0.90	0.90	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
MNLOJCT2 60 kV		P5	Non-Redundent Relay	0.86	0.84	0.81	0.91	0.90	0.79	0.92	0.99	0.84	0.99	0.89	0.80	0.81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
RLSTN35 60 kV		P5	Non-Redundent Relay	0.92	0.90	0.87	0.96	0.95	0.86	0.96	1.01	0.90	1.01	0.93	0.87	0.87	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
RLSTN45 60 kV		P5	Non-Redundent Relay	0.87	0.85	0.81	0.92	0.90	0.80	0.92	0.99	0.84	1.00	0.89	0.81	0.81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
S.L.A.C. 60 kV		P5	Non-Redundent Relay	0.86	0.84	0.81	0.91	0.89	0.79	0.92	0.99	0.83	0.99	0.88	0.80	0.81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution

Study Area: PG&E Greater Bay Area

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)					Project & Potential Mitigation Solutions
				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
SLAC TAP 60 kV		P5	Non-Redundent Relay	0.86	0.84	0.81	0.91	0.89	0.79	0.92	0.99	0.83	0.99	0.88	0.80	0.81	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
TRAN-60 60 kV		P5	Non-Redundent Relay	0.95	0.93	0.90	0.99	0.97	0.90	0.98	1.02	0.93	1.02	0.95	0.90	0.90	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
WTRSHDTP 60 kV		P5	Non-Redundent Relay	0.91	0.89	0.86	0.95	0.94	0.85	0.95	1.00	0.88	1.01	0.92	0.85	0.86	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
LARKIN D 115 kV	POTRERO 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.96	0.93	0.89	1.01	1.00	0.93	1.00	1.00	0.95	1.01	0.13	-0.44	0.89	Continue to monitor future load forecast
CLY LND 115 kV	RAVENSWOOD 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.92	0.91	0.90	0.99	0.96	0.90	0.96	0.96	0.91	0.99	0.26	0.90	0.90	Continue to monitor future load forecast
CLY LND2 115 kV	RAVENSWOOD 115 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.92	0.91	0.90	0.99	0.96	0.91	0.97	0.96	0.91	0.99	0.26	0.90	0.90	Continue to monitor future load forecast
DMTAR_SL 115 kV	STATIN J-EDES-GRANT 115kV [0] & SAN LEANDRO-OAKLND J #1 115kV [3520]	P6	N1/N1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	Sensitivity only
EDES 115 kV		P6	N1/N1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	Sensitivity only
ALMADEN 60 kV	Metcalf - El Patio No. 1 & 2 115 kV Lines	P7	DCTL	0.97	0.97	0.90	1.03	1.03	0.97	1.02	1.00	0.98	1.01	0.96	0.88	0.90	Continue to monitor future load forecast
ALMADEN 60 kV	Metcalf - Evergreen #1 and #2 115 kV Lines	P7	DCTL	0.95	0.95	0.85	1.02	1.02	0.94	1.01	1.01	0.96	1.02	0.93	0.83	0.85	Continue to monitor future load forecast
EVGRGN 1 115 kV		P7	DCTL	0.98	0.97	0.91	1.03	1.03	0.98	1.01	1.04	0.98	1.05	0.95	0.89	0.91	Sensitivity only
MABURY 60 kV		P7	DCTL	0.97	0.96	0.89	1.03	1.03	0.97	1.02	1.00	0.97	1.00	0.95	0.87	0.89	Continue to monitor future load forecast
STONE 115 kV		P7	DCTL	0.97	0.96	0.91	1.02	1.02	0.97	1.01	1.04	0.97	1.05	0.95	0.88	0.91	Sensitivity only
CRYSTLSG 60 kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.85	1.02	1.02	0.90	1.04	1.02	0.91	1.06	1.02	1.07	0.87	1.01	1.02	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
EMRLD LE 60 kV		P7	DCTL	0.87	1.03	1.02	0.91	1.05	1.03	0.92	1.06	1.03	1.07	0.89	1.02	1.02	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
LAS PLGS 60 kV		P7	DCTL	0.86	1.02	1.01	0.90	1.04	1.01	0.91	1.06	1.02	1.07	0.88	1.00	1.01	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
RALSTON 60 kV		P7	DCTL	0.86	1.03	1.02	0.90	1.04	1.02	0.91	1.06	1.03	1.07	0.88	1.01	1.02	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
STANFORD 60 kV		P7	DCTL	0.85	1.02	1.01	0.89	1.03	1.01	0.90	1.06	1.02	1.06	0.87	1.01	1.01	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution

Study Area: PG&E Greater Bay Area

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)					Project & Potential Mitigation Solutions
				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	2030 Summer Peak w/o Facility Rerates	
WOODSIDE 60 kV		P7	DCTL	0.86	1.02	1.01	0.90	1.04	1.01	0.91	1.06	1.02	1.07	0.88	1.01	1.01	Project: Jefferson 230 kV bus upgrade project In-service date: 2024 Short term: Operating solution
ALMADEN 60 kV	Newark - Los Esteros & Los Esteros - Metcalf 230 kV Lines	P7	DCTL	0.98	0.97	0.90	1.03	1.03	0.97	1.02	1.00	0.98	1.01	0.94	0.83	0.90	Continue to monitor future load forecast
BARTLP 115 kV	Swift - Metcalf & Piercy - Metcalf 115 kV Lines	P2	Bus/Breaker	0.96	0.96	0.91	1.04	1.03	0.97	1.01	1.04	0.97	1.04	0.95	0.89	0.91	Sensitivity only
MABURY 115 kV		P2	Bus/Breaker	0.96	0.96	0.91	1.04	1.03	0.97	1.01	1.04	0.97	1.04	0.95	0.89	0.91	Sensitivity only
MCKEE 115 kV		P2	Bus/Breaker	0.96	0.96	0.91	1.04	1.03	0.97	1.01	1.04	0.97	1.05	0.95	0.89	0.91	Sensitivity only
PIERCY 115 kV		P2	Bus/Breaker	0.96	0.95	0.90	1.05	1.04	0.96	1.01	1.04	0.96	1.05	0.95	0.88	0.90	Continue to monitor future load forecast
ALMADEN 60 kV	Trimble - San Jose B & Kifer - FMC 115 kV Lines	P2	Bus/Breaker	0.97	0.96	0.89	1.03	1.03	0.96	1.01	1.00	0.98	1.01	0.96	0.89	0.89	Continue to monitor future load forecast

Study Area: PG&E Greater Bay Area

Voltage Deviation



Substation	Contingency (All and Worst P6)	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)								Post Cont. Voltage Deviation % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2022 Summer Peak	2025 Summer Peak	2030 Summer Peak	2022 Winter Peak	2025 Winter Peak	2030 Winter Peak	2022 Spring Off-Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SpOP Hi Renew & Min Gas Gen	2022 SP Heavy Renewable & Min Gas Gen	2030-Summer Peak-High SVP	
E. SHORE 230 kV	EASTSHORE-SAN MATEO 230kV [4650]	P1	N-1	0.3	0.5	1.5	0.0	-0.2	0.9	1.3	-0.3	0.7	-0.7	9	1.8	Sensitivity Only
E. SHORE 230 kV	EASTSHORE-SAN MATEO 230kV [4650]	P1	N-1	0.3	0.5	1.5	0.0	-0.2	0.9	1.3	-0.3	0.7	-0.7	9	1.8	Sensitivity Only
RUSELCTY 230 kV	EASTSHORE-SAN MATEO 230kV [4650]	P1	N-1	0.3	0.5	1.4	0.0	-0.2	0.9	1.3	-0.3	0.7	-0.7	9	1.7	Sensitivity Only
RUSELCTY 230 kV	EASTSHORE-SAN MATEO 230kV [4650]	P1	N-1	0.3	0.5	1.4	0.0	-0.2	0.9	1.3	-0.3	0.7	-0.7	9	1.7	Sensitivity Only
LOS GATS 60 kV	MONTA VISTA-LOS GATOS 60kV [7610]	P1	N-1	7.4	9.1	17	2.2	2.6	10	1.3	3.8	8	3.6	9	18	Diable Automatics
MCKEE &1 115 kV	PIERCY-METCALF 115kV [4318]	P1	N-1	NA	5.8	9	NA	0.8	5.5	NA	-0.6	5.6	-0.9	NA	9	Continue to monitor future load forecast
PIERCY 115 kV	PIERCY-METCALF 115kV [4318]	P1	N-1	NA	6.8	10	NA	0.8	6.5	NA	-0.8	6.5	-1.1	NA	11	Continue to monitor future load forecast

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Transient Stability



Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	
Metcalf 500/230 kV #13 Transformer 3Ø fault with normal clearing.	P1-3	N-1	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Under Review
Metcalf 500/230 kV #13 Transformer 3Ø fault with normal clearing with LMEC offline in the base case.	P3-3	G-1/N-1	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Under Review
Metcalf 500/230 kV #13 Transformer SLG fault with delayed clearing.	P5-3	Non-Redundant Relay	No issue	No issue	No issue	No issue	No issue	No mitigation required
Tesla-Newark 230 kV line 3Ø fault with normal clearing with Metcalf 500/230 kV #13 Transformer offline in the base case.	P6-1	N-1-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
Metcalf 230 kV bus 3Ø fault with normal clearing with Metcalf 500/230 kV #13 Transformer offline in the base case.	P6-2	N-1-1	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Under Review
Contra Costa-Gateway 230 kV SLG fault with delayed clearing.	P5-2	Non-Redundant Relay	No issue	No issue	No issue	No issue	No issue	No mitigation required
Contra Costa-Gateway 230 kV SLG fault expanded to elements lost due to stuck breaker and clear fault from remote breakers with normal clearing time.	P4-2	Stuck Breaker	No issue	No issue	No issue	No issue	No issue	No mitigation required
TBC SLG fault with normal clearing.	P1-5	N-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
TBC SLG fault with normal clearing with LMEC offline in the base case.	P3-5	G-1/N-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
TBC SLG fault with normal clearing with Tesla-Newark 230 kV line offline in the base case.	P6-4	N-1-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
Newark 230 kV 3Ø fault with normal clearing.	P1-2	N-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
Tesla-Newark 230 kV line 3Ø fault with normal clearing with LMEC offline in the base case.	P3-2	G-1/N-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
Monta Vista 230 kV SVD 3Ø fault with normal clearing.	P1-4	N-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
Monta Vista 230 kV SVD 3Ø fault with normal clearing with LMEC offline in the base case.	P3-4	G-1/N-1	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Under Review
Monta Vista 230 kV SVD SLG fault expanded to elements lost due to stuck breaker and clear fault from remote breakers with normal clearing time.	P4-4	Stuck Breaker	No issue	No issue	No issue	No issue	No issue	No mitigation required
Monta Vista 230 kV SVD SLG fault with delayed clearing.	P5-4	Non-Redundant Relay	No issue	No issue	No issue	No issue	No issue	No mitigation required
Ravenswood 230 kV SVD 3Ø fault with normal clearing with Monta Vista 230 kV SVD offline in the base case.	P6-3	N-1-1	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Under Review
Metcalf 230 kV bus SLG fault with normal clearing.	P2-2	Bus	No issue	No issue	No issue	No issue	No issue	No mitigation required
Metcalf 230 kV line breaker SLG fault with normal clearing.	P2-3	Non-Bus-Tie Breaker	No issue	No issue	No issue	No issue	No issue	No mitigation required
Metcalf 230 kV bus-tie breaker SLG fault with normal clearing.	P2-4	Bus-Tie Breaker	No issue	No issue	No issue	No issue	No issue	No mitigation required

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Transient Stability



Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2025 Summer Peak	2030 Summer Peak	2025 Spring Off-Peak	2025 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	
Metcalf 500/230 kV #13 Transformer SLG fault expanded to elements lost due to stuck breaker and clear fault from remote breakers with normal clearing time.	P4-3	Stuck Breaker	No issue	No issue	No issue	No issue	No issue	No mitigation required
Crocket 3Ø fault with normal clearing with LMEC offline in the base case.	P3-1	G-1/N-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
LMEC 3Ø fault with normal clearing.	P1-1	N-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
DEC 3Ø fault with normal clearing.	P1-1	N-1	No issue	No issue	No issue	No issue	No issue	No mitigation required
Metcalf 115 kV bus SVD SLG fault expanded to elements lost due to stuck breaker and clear fault from remote breakers with normal clearing time.	P4-5	Stuck Breaker	No issue	No issue	No issue	No issue	No issue	No mitigation required
Metcalf 115 kV bus-tie breaker SVD SLG fault expanded to elements lost due to stuck breaker and clear fault from remote breakers with normal clearing time.	P4-6	Stuck Breaker	No issue	No issue	No issue	No issue	No issue	No mitigation required
Metcalf 115 kV bus SLG fault with delayed clearing.	P5-5	Non-Redundant Relay	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No issue	No issue	No issue	Under Review
Los Esteros SLG fault expanded to elements lost due to stuck breaker and clear fault from remote breakers with normal clearing time.	P4-1	Stuck Breaker	No issue	No issue	No issue	No issue	No issue	No mitigation required
Los Esteros SLG fault with delayed clearing.	P5-1	Non-Redundant Relay	No issue	No issue	No issue	No issue	No issue	No mitigation required
Contra Costa-Moraga # 1 & 2 230 kV lines SLG fault with successful high speed reclose.	P7-1	DCTL	No issue	No issue	No issue	No issue	No issue	No mitigation required
Contra Costa-Moraga # 1 & 2 230 kV lines SLG fault with unsuccessful high speed reclose.	P7-1	DCTL	No issue	No issue	No issue	No issue	No issue	No mitigation required
Tesla-Newark & Tesla-Ravenswood 230 kV lines SLG fault with successful high speed reclose.	P7-1	DCTL	No issue	No issue	No issue	No issue	No issue	No mitigation required
Tesla-Newark & Tesla-Ravenswood 230 kV lines SLG fault with unsuccessful high speed reclose.	P7-1	DCTL	No issue	No issue	No issue	No issue	No issue	No mitigation required

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Single Contingency Load Drop

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)										Potential Mitigation Solutions
			Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	

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

Study Area: PG&E Greater Bay Area



Single Source Substation with more than 100 MW Load

Substation	Load Served (MW)										Potential Mitigation Solutions
	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	

No single source substation with more than 100 MW