

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
30500 BELLOTA 230 30515 WARNERVL 230 1 1	MUSTANGSS-GATES #1 230KV [0] & MUSTANGSS-GATES #2 230KV [0]	P7	DCTL	3	22	3	86	74	52	102	98	4	Sensitivity Only
30515 WARNERVL 230 30516 WILSONRCTR 230 1 1	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	117	145	128	50	58	122	76	22	129	Protection Upgrade
	MUSTANGSS-GATES #1 230KV [0] & MUSTANGSS-GATES #2 230KV [0]	P7	DCTL	32	59.56	42	69	79	34.5	111	97	43	Sensitivity Only
30765 LOSBANOS 230 30790 PANOCHE 230 1 1	PANOCHE 230kV Section 2E	P2	Bus/Breaker	21	15	23	92	82	19	115	96	24	Sensitivity Only
	PANOCHE 230kV - Section 2D & 2E	P2	Bus/Breaker	10	15	14	119	104	14	118	82	14	Generation re-dispatch
	LOS BANOS-PANOCHE #2 230KV [5040] & LOS BANOS-DOS AMIGOS 230KV [5020]	P7	DCTL	15	10	18	86	75	14	108	89	19	Sensitivity Only
30765 LOSBANOS 230 30790 PANOCHE 230 2 1	LOSBANOS 230kV Section 2D	P2	Bus/Breaker	15	10	17	82	72	13	104	85	18	Sensitivity Only
30790 PANOCHE 230 30791 PNCHE 1M 230 1 1	ADAMS_E 12kV Gen Unit 1 & PANOCHE 230/115kV TB 2	P3	G1/N1	<100	<100	<100	<100	<100	<100	100	<100	<100	Sensitivity Only
30835 HERNDON 230 30840 FGRDN T1 230 1 1	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	92	97	65	39	41	100	41	73	66	Sensitivity Only
30835 HERNDON 230 30840 FGRDN T1 230 1 1	GREGG-HERNDON #1 230kV [4830] & GREGG-HERNDON #2 230kV [4840]	P6	N-1-1	<100	<100	<100	<100	<100	<100	104	<100	<100	Sensitivity Only
30840 FGRDN T1 230 30850 ASHLAN 230 1 1	GREGG-HERNDON #1 230kV [4830] & GREGG-HERNDON #2 230kV [4840]	P6	N-1-1	<100	<100	<100	<100	<100	<100	104	<100	<100	Sensitivity Only
30875 MC CALL 230 30877 MCCALL2M 115 2 1	MC CALL 230kV - Section 1D & 2D	P2	Bus/Breaker	N/A	99	103	N/A	29	105	25	N/A	103	Monitor future load forecast
30875 MC CALL 230 30878 MCCALL3M	MC CALL 115kV - Middle Breaker Bay 3	P2	Bus/Breaker	N/A	105	108	N/A	16	113	11	N/A	109	Bus Upgrade or Short Term rating Action Plan
	MCCALL 115KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	91	95	98	20	15	103	11	58	99	Sensitivity Only
34104 ATWATER 115 34110 ATWATR J 115 1 1	EL CAPITAN-WILSON 115kV [1510] & WILSON-ATWATER #2 115kV [4160]	P7	N-1-1	143	127	134	<100	<100	133	<100	<100	134	Atwater SPS
	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	13	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
	EL CAPITAN-WILSON 115KV [1510] & WILSON-ATWATER #2 115KV [4160]	P7	DCTL	144	127	134	13	10	133	13	94	134	Atwater SPS
34105 CERTANJ1 115 34100 CHWCHLLA 115 1 1	WILSON-LE GRAND 115kV [4170] & PANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	<100	<100	<100	<100	<100	<100	109	<100	<100	Sensitivity Only

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				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
34105 CERTANJ1 115 34121 SHARON T 115 1 1	WILSON-LE GRAND 115kV [4170] & PANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	<100	<100	<100	<100	<100	<100	140	<100	<100	Sensitivity Only
	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	53	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	92	104	92	41	66	105	63	48	119	Protection Upgrade
34110 ATWATR J 115 34144 MERCED 115 1 1	EL CAPITAN-WILSON 115kV [1510] & WILSON-ATWATER #2 115kV [4160]	P7	N-1-1	128	115	119	<100	<100	120	<100	<100	119	Atwater SPS
	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	11	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
	EL CAPITAN-WILSON 115KV [1510] & WILSON-ATWATER #2 115KV [4160]	P7	DCTL	128	115	119	11	7	120	9	87	119	Atwater SPS
34112 EXCHEQUR 115 34116 LE GRAND 115 1 1	WILSON-ATWATER #2 115kV [4160] & EXCHEQUR 70/115kV TB 1	P6	N-1-1	101	<100	100	<100	<100	<100	<100	<100	100	Generation Re-dispatch
	STAR_GT2 14kV Gen Unit 2 & MERCED 115/70kV TB 2	P3	G1/N1	<100	<100	<100	<100	<100	<100	101	<100	<100	Sensitivity Only
	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	43	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34112 EXCHEQUR 115 34232 EXCHEQUR 70.0 1 1	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	5	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34113 ARBURU T 70.0 34108 WRIGHT T 70.0 1 1	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	L1 w/o fault	N/A	84	110	N/A	19	88	22	N/A	110	Monitor future load forecast
34115 AVENAL T 70.0 34249 AVNLPARK 70.0 1 1	Base Case	P0	Base case	24	24	25	69	68	25	96	100	25	Sensitivity Only
34116 LE GRAND 115 34134 WILSON A 115 1 1	QUINTO SW STA-WESTLEY 230kV [5070] & LOSBANOS 500/230kV TB 1	P6	N-1-1	<100	<100	<100	100	<100	<100	<100	<100	<100	Project:Wilson-Legrand 115kV Reconductoring In-service date: 12/20
	WILSON 230/115kV TB 1 & WILSON 230/115kV TB 2	P6	N-1-1	0	<100	<100	<100	<100	<100	<100	157	<100	
	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	63	41	19	39	11	43	26	133	19	
	SANGER - MD 115kV & KERCKHOFF-CLOVIS-SANGER #1 line	P2	Bus/Breaker	38	N/A	N/A	122	N/A	N/A	N/A	101	N/A	
	HERNDON - 2D 115kV & HERNDON-WOODWARD line	P2	Bus/Breaker	25	N/A	N/A	100	N/A	N/A	N/A	59	N/A	
	PANOCHE 230kV - Section 1E & 2E	P2	Bus/Breaker	33	6	6	101	27	7	40	87	6	
	HERNDON 230kV - Section 1D & 2D	P2	Bus/Breaker	54	N/A	N/A	107	N/A	N/A	N/A	35	N/A	

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HERNDON 115KV T 115 1 1	HERNDON 115kV - Section 1D & 2D	P2	Bus/Breaker	39	N/A	N/A	121	N/A	N/A	N/A	41	N/A	Short term: Action Plan
	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	66	21	17	119	33	22	46	18	22	
	BORDEN-GREGG 230KV #1 & #2 [4400]	P7	DCTL	63	41	19	39	11	43	26	133	19	
	WILSON-BORDEN 230KV #1 & #2 [9001]	P7	DCTL	31	N/A	N/A	50	N/A	N/A	N/A	118	N/A	
	KERCKHOFF-CLOVIS-SANGER #1 115KV [1890] & KERCKHOFF-CLOVIS-SANGER #2 115KV [1900]	P7	DCTL	37	9	9	121	30	8	43	78	9	
34117 KETLMN T 70.0 34552 GATES 70.0 1 1	Base Case	P0	Base case	60	61	63	99	99	63	141	130	63	Sensitivity Only
	AVENAL_1 21kV Gen Unit EW	P1	N-1	51	53	55	85	85	54	113	77	55	Sensitivity Only
	AVENAL P 12kV Gen Unit 1	P1	N-1	51	53	55	72	73	54	108	98	55	Sensitivity Only
	ARCO-TULARE LAKE 70kV [8451]	P1	N-1	N/A	80	83	N/A	89	83	126	N/A	83	Sensitivity Only
	GATES-TULARE LAKE 70kV [8700] (AVENAL T-CHEVPL T)	P2	L1 w/o fault	49	50	52	88	88	52	123	114	52	Sensitivity Only
	TLRE LKE 70kV Section MA	P2	Bus/Breaker	N/A	80	83	N/A	89	83	126	N/A	83	Sensitivity Only
	TLRE LKE - MA 70kV & ARCO-TULARE LAKE line	P2	Bus/Breaker	N/A	80	83	N/A	89	83	126	N/A	83	Sensitivity Only
34121 SHARON T 115 34128 OAKH_JCT 115 1 1	WILSON-LE GRAND 115kV [4170] & PANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	<100	<100	<100	<100	<100	<100	136	<100	<100	Sensitivity Only
	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	50	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	88	110.92	89	44	70	101	66	44	116	Protection Upgrade
34134 WILSON A 115 34104 ATWATER 115 1 1	EL CAPITAN-WILSON 115kV [1510] & ATWATER-LIVNGSTN-MERCED 115kV [1030]	P6	N-1-1	126	116	118	<100	<100	119	<100	<100	118	Operation Switching and monitor future load forecast
34134 WILSON A 115 34138 EL CAPTN 115 1 1	WILSON-ATWATER #2 115kV [4160] & ATWATER-LIVNGSTN-MERCED 115kV [1030]	P6	N-1-1	<100	121	125	<100	<100	126	<100	<100	125	Operation Switching and monitor future load forecast
34134 WILSON A 115 34144 MERCED 115 1 1	WILSON-ATWATER #2 115kV [4160] & EL CAPITAN-WILSON 115kV [1510]	P6	N-1-1	123	128	136	<100	<100	134	<100	<100	137	Atwater SPS
	WILSON B 115kV Section 2D	P2	Bus/Breaker	115	N/A	N/A	12	N/A	N/A	N/A	72	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
	WILSON B - 2D 115kV & WILSON-ORO LOMA line	P2	Bus/Breaker	115	N/A	N/A	12	N/A	N/A	N/A	72	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
	EL CAPITAN-WILSON 115KV [1510] & WILSON-ATWATER #2 115KV [4160]	P7	DCTL	127	130	139	9	15	136	21	82	139	Atwater SPS

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34134 WILSON A 115 34144 MERCED 115 2 1	WILSON-ATWATER #2 115kV [4160] & EL CAPITAN-WILSON 115kV [1510]	P6	N-1-1	<100	122	130	<100	<100	127	<100	<100	130	Atwater SPS
	EL CAPITAN-WILSON 115KV [1510] & WILSON-ATWATER #2 115KV [4160]	P7	DCTL	121	123	132	8	15	129	20	77	132	Atwater SPS
34136 WILSON B 115 34138 EL CAPTN 115 1 1	ATWATER-LIVNGSTN-MERCED 115kV [1030] & WILSON-ATWATER #2 115kV [4160]	P6	N-1-1	115	<100	<100	<100	<100	<100	<100	<100	<100	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
	WILSON-ATWATER #2 115kV [4160] & ATWATER-LIVNGSTN-MERCED 115kV [1030]	P6	N-1-1	115	<100	<100	<100	<100	<100	<100	<100	<100	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34136 WILSON B 115 34144 MERCED 115 2 1	EL CAPITAN-WILSON 115kV [1510] & WILSON-ATWATER #2 115kV [4160]	P6	N-1-1	117	<100	<100	<100	<100	<100	<100	<100	<100	Atwater SPS
	WILSON A 115kV Section 1D	P2	Bus/Breaker	112	N/A	N/A	18	N/A	N/A	N/A	64	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34144 MERCED 115 34146 MERCED M 115 2 1	WILSON-LE GRAND 115kV [4170] & DAIRYLAND-MENDOTA 115kV [1360]	P6	N-1-1	<100	<100	<100	<100	<100	<100	102	<100	<100	Sensitivity Only
34144 MERCED 115 34146 MERCED M 115 2 1	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	41	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34149 CHENYT 115 34158 PANOCH2 115 1 1	GATES 230/70kV TB 5 & PANOCH1-EXCELSIORSS 115kV [0]	P6	N-1-1	<100	<100	<100	100	100	<100	201	162	<100	Generation Re-dispatch
	GATES 230/70kV TB 5	P1	N-1	24	26	28	100	94	26	112	89	28	Generation re-dispatch
	PANOCH1 115kV Section 1D	P2	Bus/Breaker	27	29	34	104	98	31	109	82	34	Generation re-dispatch
	GATES 230kV Section 2D	P2	Bus/Breaker	22	24	26	105	99	24	117	92	27	Generation re-dispatch
	PANOCH1 - 1D 115kV & PANOCH1-CAL PEAK-STARWOOD line	P2	Bus/Breaker	27	29	34	104	98	31	109	82	34	Generation re-dispatch
	PANOCH1 - 1D 115kV & PANOCH1-MENDOTA line	P2	Bus/Breaker	27	29	34	104	98	31	109	82	34	Generation re-dispatch
	PANOCH1-SCHINDLER #1 115kV [3250] (PANOCH1-KAMM)	P2	L1 w/o fault	N/A	27	30	N/A	98	28	109	N/A	31	Sensitivity Only
34149 CHENYT 115 34393 EXCELSIORSS 115 2 1	GATES 230/70kV TB 5 & PANOCH1-EXCELSIORSS 115kV [0]	P6	N-1-1	<100	<100	<100	<100	<100	<100	189	154	<100	Sensitivity Only
	GATES 230/70kV TB 5	P1	N-1	37	36	35	86	89	37	106	84	36	Sensitivity Only
	PANOCH1-SCHINDLER #1 115kV [3250] (PANOCH1-KAMM)	P2	L1 w/o fault	N/A	40	38	N/A	93	38	103	N/A	39	Sensitivity Only
	PANOCH1 115kV Section 1D	P2	Bus/Breaker	36	36	34	88	93	34	103	78	35	Sensitivity Only
	GATES 230kV Section 2D	P2	Bus/Breaker	N/A	40	38	N/A	93	41	110	N/A	39	Sensitivity Only

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	PANOCHÉ1 - 1D 115kV & PANOCHÉ-CAL PEAK-STARWOOD line	P2	Bus/Breaker	N/A	36	34	N/A	93	34	103	N/A	35	Sensitivity Only
	PANOCHÉ1 - 1D 115kV & PANOCHÉ-MENDOTA line	P2	Bus/Breaker	N/A	36	34	N/A	93	34	103	N/A	35	Sensitivity Only
34155 PANOCHÉ1 115 34350 KAMM 115 1 1	GATES 230kV Section 2D	P2	Bus/Breaker	47	45	43	103	104	47	124	96	45	Generation re-dispatch
	EXCELSIORSS 115kV - Middle Breaker Bay 1	P2	Bus/Breaker	N/A	42	40	N/A	100	40	111	N/A	40	Generation re-dispatch
	GATES 230/70kV TB 5 & EXCELSIORSS-PANOCHÉ2 115kV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	215	168	<100	Sensitivity Only
	EXCELSIORSS-PANOCHÉ2 115kV [3231]	P1	N-1	N/A	42	40	N/A	100	40	111	N/A	40	Generation re-dispatch
	GATES 230/70kV TB 5	P1	N-1	43	41	40	98	99	43	119	93	41	Sensitivity Only
	PANOCHÉ2 115kV Section 2D	P2	Bus/Breaker	15	15	18	87	97	13	108	80	18	Sensitivity Only
	PANOCHÉ2 - 2D 115kV & EXCELSIORSS-PANOCHÉ2 line	P2	Bus/Breaker	N/A	45	42	N/A	97	43	108	N/A	43	Sensitivity Only
	PANOCHÉ2 - 2D 115kV & PANOCHÉ-ORO LOMA line	P2	Bus/Breaker	N/A	15	18	N/A	97	13	108	N/A	18	Sensitivity Only
	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	132	103	112	<100	<100	127	<100	<100	130	Operating Solution
34169 TORNDO J 70.0 34574 COLNGA 1 70.0 1 1	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	<100	<100	<100	<100	<100	<100	172	143	<100	Sensitivity Only
	PANOCHÉ1 Section 1D & PANOCHÉ2 Section 2D 115kV	P2	Bus/Breaker	48	49	52	92	90	47	104	103	50	Sensitivity Only
	PANOCHÉ-SCHINDLER #1 115kV [3250] & EXCELSIORSS-PANOCHÉ2 115kV [3231]	P7	DCTL	29	33	37	92	90	31	104	103	35	Sensitivity Only
34202 MERCED 70.0 34230 MRCDFLLS 70.0 1 1	PANOCHÉ-MENDOTA 115kV [3230] & WILSON-LE GRAND 115kV [4170]	P6	N-1-1	<100	<100	<100	<100	<100	<100	105	<100	<100	Sensitivity Only
	WILSON-LE GRAND 115kV [4170] & DAIRYLAND-MENDOTA 115kV [1360]	P6	N-1-1	<100	<100	<100	<100	<100	<100	111	<100	<100	Sensitivity Only
	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	35	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34202 MERCED 70.0 34146 MERCED M 115 2 1	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	38	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34214 LOS BANS 70.0 34231 PCHCOWND 70.0 1 1	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	L1 w/o fault	102	106	136	13	21	109	25	51	137	Non-BES
34231 PCHCOWND 70.0 34108 WRIGHT T 70.0 1 1	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	L1 w/o fault	N/A	93	119	N/A	18	95	22	N/A	119	Non-BES
34237 CANANDGA 70.0 34255 TRIGO J 70.0 1 1	BORDEN-MADERA #1 70kV [8710] & BORDEN-MADERA #2 70kV [8520]	P6	N-1-1	174	171	173	<100	<100	176	<100	132	173	Non-BES
34240 GLASS 70.0 34237 CANANDGA 70.0 1 1	BORDEN-MADERA #1 70kV [8710] & BORDEN-MADERA #2 70kV [8520]	P6	N-1-1	104	<100	101	<100	<100	101	<100	<100	101	Non-BES



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34240 GLASS 70.0 34256 BORDEN 70.0 1 1	BORDEN-MADERA #1 70kV [8710] & BORDEN-MADERA #2 70kV [8520]	P6	N-1-1	114	105	109	<100	<100	108	<100	<100	109	Non-BES
34256 BORDEN 70.0 30805 BORDEN 230 1 1	EL CAPITAN-WILSON 115kV [1510] & BORDEN 230/70kV TB 4	P6	N-1-1	<100	<100	<100	<100	<100	101	<100	<100	<100	Sensitivity Only
34258 MERCYSPRNGSS 70.0 34113 ARBURU T 70.0 1 1	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	L1 w/o fault	N/A	92	122	N/A	25	96	29	N/A	122	Non-BES
34321 MCSWAINJ 70.0 34230 MRCDFLLS 70.0 1 1	WILSON-LE GRAND 115kV [4170] & DAIRYLAND-MENDOTA 115kV [1360]	P6	N-1-1	<100	<100	<100	<100	<100	<100	100	<100	<100	Sensitivity Only
	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	27	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34321 MCSWAINJ 70.0 34232 EXCHEQUR 70.0 1 1	WILSON-LE GRAND 115kV [4170] & DAIRYLAND-MENDOTA 115kV [1360]	P6	N-1-1	<100	<100	<100	<100	<100	<100	114	<100	<100	Sensitivity Only
	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	N/A	N/A	32	N/A	N/A	N/A	Diverge	N/A	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
34350 KAMM 115 34352 CANTUA 115 1 1	GATES 230/70kV TB 5 & EXCELSIORSS-PANOCHE2 115kV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	205	161	<100	Sensitivity Only
	EXCELSIORSS-PANOCHE2 115kV [3231]	P1	N-1	N/A	36	34	N/A	97	34	108	N/A	35	Sensitivity Only
	GATES 230/70kV TB 5	P1	N-1	37	36	34	95	96	37	115	91	36	Sensitivity Only
	PANOCHE2 115kV Section 2D	P2	Bus/Breaker	11	11	16	84	94	9	104	78	16	Sensitivity Only
	GATES 230kV Section 2D	P2	Bus/Breaker	N/A	40	38	N/A	101	41	120	N/A	39	Generation re-dispatch
	PANOCHE2 - 2D 115kV & EXCELSIORSS-PANOCHE2 line	P2	Bus/Breaker	N/A	39	37	N/A	94	37	104	N/A	37	Sensitivity Only
	PANOCHE2 - 2D 115kV & PANOCHE-ORO LOMA line	P2	Bus/Breaker	N/A	11	16	N/A	94	9	104	N/A	16	Sensitivity Only
	EXCELSIORSS 115kV - Middle Breaker Bay 1	P2	Bus/Breaker	N/A	36	34	N/A	97	34	108	N/A	35	Sensitivity Only
34352 CANTUA 115 34432 WESTLNDS 115 1 1	GATES 230/70kV TB 5 & EXCELSIORSS-PANOCHE2 115kV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	187	152	<100	Sensitivity Only
	GATES 230kV Section 2D	P2	Bus/Breaker	N/A	31	30	N/A	88	32	101	N/A	31	Sensitivity Only
34358 KERCKHF2 115 34360 WWARD JT 115 1 1	CHOWCHILLA-KERCKHOFF 115kV [1250] & KERCKHOFF-CLOVIS-SANGER #2 115kV [1900]	P6	N-1-1	107	107	113	<100	<100	109	<100	107	113	Kerckhoff SPS
34365 CLOVISJ2 115 34358 KERCKHF2 115 1 1	CHOWCHILLA-KERCKHOFF 115kV [1250] & KERCKHOFF-CLOVIS-SANGER #1 115kV [1890]	P6	N-1-1	108	107	113	<100	<100	109	<100	107	113	Kerckhoff SPS
34359 AIRWAYJ2 115 34408 BARTON 115 1 1	HERNDON 115kV Section 2D	P2	Bus/Breaker	N/A	33	32	N/A	95	27	101	N/A	31	Sensitivity Only
	HERNDON - 2D 115kV & HERNDON-BULLARD #2 line	P2	Bus/Breaker	N/A	33	32	N/A	95	27	101	N/A	31	Sensitivity Only
	HERNDON - 2D 115kV & HERNDON-WOODWARD line	P2	Bus/Breaker	N/A	32	31	N/A	95	27	101	N/A	30	Sensitivity Only



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
34366 SANGER 115 34359 AIRWAYJ2 115 1 1	HERNDON 230kV - Section 1D & 2D	P2	Bus/Breaker	106	N/A	N/A	11	N/A	N/A	N/A	73	N/A	Project: Northern Fresno 115kV Area Reinforcement In-service date: 12/20 Short term: Action Plan
34370 MC CALL 115 34385 KINGS J1 115 1 1	HENRIETTA-LEPRINO SW STA 115kV [1737] & MCCALL-KINGSBURG #2 115kV [2301]	P6	N-1-1	<100	<100	<100	<100	<100	<100	162	<100	<100	Sensitivity Only
34370 MC CALL 115 30877 MCCALL2M 115 2 1	MC CALL 230kV - Section 1D & 2D	P2	Bus/Breaker	N/A	98	100	N/A	29	104	25	N/A	101	Monitor future load forecast
34370 MC CALL 115 30878 MCCALL3M 115 3 1	MC CALL 115kV - Middle Breaker Bay 3	P2	Bus/Breaker	N/A	103	106	N/A	15	111	8	N/A	107	Bus Upgrade or Short Term rating Action Plan
	MCCALL 115KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	89	93	96	19	13	100	9	57	97	Sensitivity Only
34382 WAHTOKE 115 34380 REEDLEY 115 1 1	KINGS RIVER-SANGER-REEDLEY 115kV [2030] & SANGER-REEDLEY 115kV [9140]	P6	N-1-1	102	106	110	<100	<100	111	<100	<100	110	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Action Plan
34390 DANISHCM 115 34370 MC CALL 115 1 1	MCCALL-WEST FRESNO #2 115kV [2370] & SANGER-CALIFORNIA AVE 115kV [9130]	P6	N-1-1	<100	<100	107	<100	<100	<100	<100	<100	109	Monitor future load forecast
34393 EXCELSIORSS 115 34354 SCHINDLR 115 1 1	EXCELSIORSS-SCHINDLR #2 115kV [0] & GATES 230/70kV TB 5	P6	N-1-1	<100	<100	<100	<100	<100	<100	142	109	109	Sensitivity Only
	EXCELSIORSS-SCHINDLR #1 115kV [0] & GATES 230/70kV TB 5	P6	N-1-1	<100	<100	<100	<100	<100	<100	142	109	<100	Sensitivity Only
34402 CAL AVE 115 34366 SANGER 115 1 1	CALIFORNIA AVE-MCCALL 115kV [2360] & MCCALL-WEST FRESNO #2 115kV [2370]	P6	N-1-1	<100	<100	102	<100	<100	<100	<100	<100	102	Monitor future load forecast
	CALIFORNIA AVE-MCCALL 115KV [2360] & MCCALL-WEST FRESNO #2 115KV [2370]	P7	DCTL	91	93	102	3	4	97	8	63	102	Monitor future load forecast
	MCCALL 115KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	93	95	104	3	4	98	8	64	105	Protection Upgrade
34402 CAL AVE 115 34390 DANISHCM 115 1 1	MCCALL-WEST FRESNO #2 115kV [2370] & SANGER-CALIFORNIA AVE 115kV [9130]	P6	N-1-1	<100	<100	103	<100	<100	<100	<100	<100	103	Monitor future load forecast
34408 BARTON 115 34412 HERNDON 115 1 1	HERNDON-MANCHESTER 115kV [1780] & HERNDON-WOODWARD 115kV [1790]	P6	N-1-1	<100	<100	<100	<100	100	<100	<100	<100	<100	Generation Re-dispatch
	HERNDON 115kV Section 2D	P2	Bus/Breaker	89	87	89	100	106	82	114	55	87	Generation Re-dispatch
	MUSTANGSS 230kV - Middle Breaker Bay 3	P2	Bus/Breaker	50	48	52	85	91	49	109	10	51	Generation Re-dispatch
	HERNDON - 2D 115kV & HERNDON-BULLARD #2 line	P2	Bus/Breaker	89	N/A	N/A	100	N/A	N/A	N/A	55	N/A	Generation Re-dispatch
	HERNDON - 2D 115kV & HERNDON-BULLARD #2 line	P2	Bus/Breaker	N/A	87	89	N/A	106	82	114	N/A	87	Generation Re-dispatch
	HERNDON - 2D 115kV & HERNDON-WOODWARD line	P2	Bus/Breaker	89	N/A	N/A	100	N/A	N/A	N/A	54	N/A	Generation Re-dispatch



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
	HERNDON - 2D 115kV & HERNDON-WOODWARD line	P2	Bus/Breaker	N/A	87	88	N/A	107	82	114	N/A	87	Generation Re-dispatch
34409 PNDLJ2 115 34416 BULLARD 115 1 1	HERNDON-BULLARD #1 115kV [1760] (HERNDON-PNDLJ1)	P2	L1 w/o fault	115	N/A	N/A	15	N/A	N/A	N/A	87	N/A	Project: Herndon-Bullard Reconductoring Project In-service date: 01/21 Short term: Action Plan
	HERNDON 115kV Section 1D	P2	Bus/Breaker	115	N/A	N/A	15	N/A	N/A	N/A	87	N/A	Project: Herndon-Bullard Reconductoring Project In-service date: 01/21 Short term: Action Plan
34410 MANCHSTR 115 34368 LASPALMS 115 1 1	HERNDON-BARTON 115kV [1750] & HERNDON-WOODWARD 115kV [1790]	P6	N-1-1	<100	<100	<100	<100	100	<100	<100	<100	<100	Generation Re-dispatch
	MUSTANGSS 230kV - Middle Breaker Bay 3	P2	Bus/Breaker	9	9	12	85	87	8	103	38	12	Sensitivity Only
34414 WOODWARD 115 34422 CHLDHOSP 115 1 1	HERNDON-BARTON 115KV [1750] & MANCHESTER-AIRWAYS-SANGER 115KV [2180]	P7	DCTL	63	62	65	90	93	59	101	27	64	Sensitivity Only
	BARTON-AIRWAYS-SANGER 115KV [1060] & MANCHESTER-AIRWAYS-SANGER 115KV [2180]	P7	DCTL	43	41	43	92	94	37	101	12	42	Sensitivity Only
34418 KINGSBURGD 115 34419 KINGSBURGE 115 1 1	HENRIETTA-LEPRINO SW STA 115kV [1737] & MC CALL-SUNMAID-KNGSCOGN-KINGSBURGD 115kV [2290]	P6	N-1-1	<100	<100	<100	<100	<100	<100	134	<100	109	Sensitivity Only
34418 KINGSBURGD 115 34434 WAUKENA_SS 115 2 1	CORCORAN 115/70kV TB 1 & KINGSBURG-CORCORAN #1 115kV [2040]	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	108	109	Sensitivity Only
	KINGSBURG-CORCORAN #1 115kV [2040] (KINGSBURGE-Q529TP)	P2	L1 w/o fault	60	N/A	N/A	100	N/A	N/A	N/A	101	N/A	Sensitivity Only
34418 KINGSBURGD 115 364621 JACKSONSWSTA 115 2 1	HENRIETTA-LEPRINO SW STA 115kV [1737] & KINGSBURGD-JACKSONSWSTA #3 115kV [0]	P6	N-1-1	<100	<100	<100	<100	<100	<100	125	<100	<100	Sensitivity Only
34419 KINGSBURGE 115 364621 JACKSONSWSTA 115 1 1	HENRIETTA-LEPRINO SW STA 115kV [1737] & KINGSBURGD-JACKSONSWSTA #3 115kV [0]	P6	N-1-1	<100	<100	<100	<100	<100	<100	128	<100	109	Sensitivity Only
34419 KINGSBURGE 115 34436 Q529TP 115 1 1	CORCORAN 115/70kV TB 1 & KINGSBURG-WAUKENA SW STA 115kV [2050]	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	108	109	Sensitivity Only
	KINGSBURG-WAUKENA SW STA 115kV [2050]	P1	N-1	60	N/A	N/A	100	N/A	N/A	N/A	101	N/A	Sensitivity Only
	KINGSBURGD 115kV Section 1D	P2	Bus/Breaker	60	N/A	N/A	100	N/A	N/A	N/A	100	N/A	Sensitivity Only
	KINGSBURGD - 1D 115kV & MC CALL-SUNMAID-KNGSCOGN-KINGSBURGD line	P2	Bus/Breaker	60	N/A	N/A	100	N/A	N/A	N/A	100	N/A	Sensitivity Only
	KINGSBURGD - 1D 115kV & GWF-KINGSBURG line	P2	Bus/Breaker	60	N/A	N/A	100	N/A	N/A	N/A	100	N/A	Sensitivity Only
34423 GAURD J1 115 34370 MC CALL 115 2 1	JACKSONSWSTA-GWF_HEP 115kV [1743] & MC CALL-SUNMAID-KNGSCOGN-KINGSBURGD 115kV [2290]	P6	N-1-1	<100	<100	109	N/A	<100	102	<100	N/A	109	Monitor future load forecast

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
34429 GWF_HEP 115 34428 CONTADNA 115 1 1	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	67	96	94	21	32	102	45	28	96	Sensitivity Only
	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	75	94	96	26	39	99	53	32	104	Sensitivity Only
34430 HENRETTA 115 30881 HENRIETA 230 3 1	MC CALL-CHSR09SWSTA #1 230kV [0] & TRANQUILLITY SW STA-HELM 230kV [5370]	P6	N-1-1	<100	<100	<100	<100	116	<100	117	<100	<100	FRTSPS drops pumps
	CHSR09SWSTA-MUSTANGSS 230kV [4710]	P1	N-1	N/A	32	28	N/A	94	39	111	N/A	27	Sensitivity Only
	MUSTANGSS 230kV - Middle Breaker Bay 2	P2	Bus/Breaker	N/A	32	28	N/A	94	39	111	N/A	27	Sensitivity Only
	PANOCH 230kV - Section 2D & 1D	P2	Bus/Breaker	18	36	31	86	101	43	116	63	30	FRTSPS drops pumps
	HERNDON 230kV - Section 1E & 2E	P2	Bus/Breaker	N/A	52	50	N/A	92	56	107	N/A	49	Sensitivity Only
	HERNDON 115kV - Section 1D & 2D	P2	Bus/Breaker	N/A	49	46	N/A	94	53	108	N/A	45	Sensitivity Only
	KINGSBURGD Section 1D & KINGSBURGE Section 1E 115kV	P2	Bus/Breaker	N/A	7	13	N/A	91	6	107	N/A	15	Sensitivity Only
	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	47	66	61	79	91	71	107	22	67	Sensitivity Only
	MCCALL 115KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	17	63	60	60	92	68	111	46	57	Sensitivity Only
	PANOCH-TRANQLTYSS #1 230KV [0] & PANOCH-TRANQLTYSS #2 230KV [0]	P7	DCTL	20	38	32	85	101	44	115	63	31	FRTSPS drops pumps
	MCCALL-KINGSBURG #1 115KV [2290] & MCCALL-KINGSBURG #2 115KV [2301]	P7	DCTL	62	63	59	86	92	68	111	47	57	Sensitivity Only
	HELM-MCCALL 230KV [4860] & HENTAP2-MUSTANGSS #1 230KV [0]	P7	DCTL	30	50	43	98	117	58	136	55	43	FRTSPS drops pumps
	TRANQLTYSS-HELM #1 230KV [0] & TRANQLTYSS-MCMULLN1 #1 230KV [0]	P7	DCTL	20	38	32	75	89	43	104	50	31	Sensitivity Only
	MC CALL-CHSR09SWSTA #1 230kV [0] & TRANQUILLITY SW STA-HELM 230kV [5370]	P6	N-1-1	<100	<100	<100	<100	115	<100	114	<100	<100	FRTSPS drops pumps
	CHSR09SWSTA-MUSTANGSS 230kV [4710]	P1	N-1	N/A	32	28	N/A	93	39	108	N/A	27	Sensitivity Only
	MUSTANGSS 230kV - Middle Breaker Bay 2	P2	Bus/Breaker	N/A	32	28	N/A	93	39	108	N/A	27	Sensitivity Only
	PANOCH 230kV - Section 2D & 1D	P2	Bus/Breaker	18	36	30	85	100	43	114	63	30	FRTSPS drops pumps
	HERNDON 230kV - Section 1E & 2E	P2	Bus/Breaker	N/A	51	50	N/A	92	56	105	N/A	49	Sensitivity Only
	HERNDON 115kV - Section 1D & 2D	P2	Bus/Breaker	N/A	49	46	N/A	93	53	106	N/A	45	Sensitivity Only
	KINGSBURGD Section 1D & KINGSBURGE Section 1E 115kV	P2	Bus/Breaker	N/A	5	11	N/A	90	3	104	N/A	14	Sensitivity Only

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
34430 HENRETTA 115 34519 LPRNJCTSS 115 1 1	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	47	66	60	78	91	71	104	22	65	Sensitivity Only
	MCCALL 115KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	16	63	59	59	90	67	108	46	56	Sensitivity Only
	PANOCHÉ-TRANQLTYSS #1 230KV [0] & PANOCHÉ-TRANQLTYSS #2 230KV [0]	P7	DCTL	20	37	32	85	101	44	113	62	31	FRTSPS drops pumps
	MCCALL-KINGSBURG #1 115KV [2290] & MCCALL-KINGSBURG #2 115KV [2301]	P7	DCTL	62	63	59	84	90	67	108	47	56	Sensitivity Only
	HELM-MCCALL 230KV [4860] & HENTAP2-MUSTANGSS #1 230KV [0]	P7	DCTL	29	50	43	96	116	58	133	55	43	FRTSPS drops pumps
	TRANQLTYSS-HELM #1 230KV [0] & TRANQLTYSS-MCMULLN1 #1 230KV [0]	P7	DCTL	20	37	32	75	88	43	102	49	31	Sensitivity Only
34432 WESTLND 115 34393 EXCELSIORSS 115 1 1	GATES 230/70kV TB 5 & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	189	154	<100	Sensitivity Only
	CANTUA_DIST 12kV Gen Unit 1 & GATES 230/70kV TB 5	P3	G1/N1	<100	<100	<100	<100	<100	<100	101	<100	<100	Sensitivity Only
	GATES 230kV Section 2D	P2	Bus/Breaker	N/A	29	28	N/A	90	30	104	N/A	29	Sensitivity Only
34436 Q529TP 115 34420 CORCORAN 115 1 1	JACKSONSWSTA-WAUKENA_SS #1 115kV [0] & CORCORAN 115/70kV TB 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	141	<100	<100	Sensitivity Only
	JACKSONSWSTA-WAUKENA_SS #1 115kV [0]	P1	N-1	N/A	63	80	N/A	99	66	137	N/A	80	Sensitivity Only
	JACKSONSWSTA 115kV - Middle Breaker Bay 2	P2	Bus/Breaker	N/A	63	80	N/A	99	66	137	N/A	80	Sensitivity Only
34469 GFFNJCT 70.0 34470 GIFFEN 70.0 1 1	Base Case	P0	Base case	36	36	35	100	76	39	68	101	36	Sensitivity Only
34474 HELM 70.0 34473 SNJQTP 70.0 1 1	Base Case	P0	Base case	24	21	27	88	43	19	101	43	37	Sensitivity Only
34492 REEDLEY 70.0 34380 REEDLEY 115 2 1	DNUBAEGY 70/13.8kV TB 1 & REEDLEY 115/70kV TB 4	P6	N-1-1	104	108	108	<100	<100	112	<100	<100	108	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Action Plan
	DINUBA E 14kV Gen Unit 1 & REEDLEY 115/70kV TB 4	P3	G1/N1	104	108	108	<100	<100	112	<100	<100	108	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Action Plan
	REEDLEY 115/70kV TB 4	P1	N-1	94	97	98	8	19	101	25	67	98	Sensitivity Only
	REEDLEY 115kV - Ring R3 & R4	P2	Bus/Breaker	N/A	97	98	N/A	19	101	25	N/A	98	Sensitivity Only
	REEDLEY 115kV - Ring R5 & R4	P2	Bus/Breaker	N/A	97	99	N/A	19	101	25	N/A	99	Sensitivity Only

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
34492 REEDLEY 70.0 34497 DNUBAJCT 70.0 1 1	DNUBAEGY 70/13.8kV TB 1 & REEDLEY-OROSI 70kV [9061]	P6	N-1-1	<100	108	112	<100	<100	112	<100	<100	112	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	DINUBA E 14kV Gen Unit 1 & REEDLEY-OROSI 70kV [9061]	P3	G1/N1	<100	108	112	<100	<100	112	<100	<100	112	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-OROSI 70kV [9060] (REEDLEY-ORSI JCT)	P2	L1 w/o fault	46	104	110	14	20	109	25	28	110	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
34492 REEDLEY 70.0 34526 ORSI JCT 70.0 1 1	REEDLEY-DINUBA #1 70kV [9050] & MCCALL-REEDLEY 115kV [2320]	P6	N-1-1	<100	<100	112	<100	<100	<100	<100	<100	112	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-DINUBA #1 70kV [9050] & REEDLEY 115/70kV TB 2	P6	N-1-1	<100	107	109	<100	<100	112	<100	<100	<100	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-DINUBA #1 70kV [9050]	P1	N-1	N/A	104	109	N/A	7	108	11	N/A	109	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-DINUBA #1 70kV [9050] (DNUBAJCT-DINUBA)	P2	L1 w/o fault	N/A	103	108	N/A	7	107	11	N/A	108	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
34496 STCRRL J 70.0 34500 DINUBA 70.0 1 1	REEDLEY-DINUBA #1 70kV [9050] & MCCALL-REEDLEY 115kV [2320]	P6	N-1-1	<100	<100	110	<100	<100	<100	<100	<100	110	Monitor future load forecast
	REEDLEY-DINUBA #1 70kV [9050] & REEDLEY 115/70kV TB 2	P6	N-1-1	<100	105	107	<100	<100	110	<100	<100	<100	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-DINUBA #1 70kV [9050]	P1	N-1	N/A	102	107	N/A	12	107	17	N/A	107	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
	REEDLEY-DINUBA #1 70kV [9050] (DNUBAJCT-DINUBA)	P2	L1 w/o fault	N/A	101	106	N/A	12	106	17	N/A	106	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
34497 DNUBAJCT 70.0 34500 DINUBA 70.0 1 1	REEDLEY-OROSI 70kV [9061]	P1	N-1	N/A	107	111	N/A	9	111	14	N/A	111	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-OROSI 70kV [9060] (REEDLEY-ORSI JCT)	P2	L1 w/o fault	59	119	125	2	8	123	13	41	125	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-OROSI 70kV [9060] (OROSI-ORSI JCT)	P2	L1 w/o fault	N/A	107	111	N/A	9	111	14	N/A	111	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
34502 OROSI 70.0 34526 ORSI JCT 70.0 1 1	REEDLEY-DINUBA #1 70kV [9050] & MCCALL-REEDLEY 115kV [2320]	P6	N-1-1	<100	<100	119	<100	<100	<100	<100	<100	119	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-DINUBA #1 70kV [9050] & REEDLEY 115/70kV TB 2	P6	N-1-1	<100	114	116	<100	<100	119	<100	<100	<100	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-DINUBA #1 70kV [9050]	P1	N-1	N/A	110	116	N/A	9	115	14	N/A	116	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
	REEDLEY-DINUBA #1 70kV [9050] (DNUBAJCT-DINUBA)	P2	L1 w/o fault	N/A	110	115	N/A	9	114	14	N/A	115	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Short term: Summer Setup in Place
34552 GATES 70.0 30900 GATES 230 5 1	PANOCHE1 Section 1D & PANOCHE2 Section 2D 115kV	P2	Bus/Breaker	24	22	21	105	105	25	130	102	22	Short term rating followed by a redispatch
	EXCELSIORSS-PANOCHE1 115KV [3250] & EXCELSIORSS-PANOCHE2 115KV [3231]	P7	DCTL	40	38	37	99	101	40	123	99	38	Short term rating followed by a redispatch
	PANOCHE-SCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHE2 115KV [3231]	P7	DCTL	45	45	43	105	105	47	130	102	44	Short term rating followed by a redispatch

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
	EXCELSIORSS-PANOCHE1 115kV [3250] & EXCELSIORSS-PANOCHE2 115kV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	123	<100	<100	Sensitivity Only
34552 GATES 70.0 34555 JAYNESWSTA 70.0 1 1	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	108	<100	<100	Sensitivity Only
34552 GATES 70.0 34559 HURONJ 70.0 2 1	EXCELSIORSS-PANOCHE2 115kV [3231] & GATES-HURON 70kV [8690]	P6	N-1-1	<100	<100	<100	<100	<100	<100	105	<100	<100	Sensitivity Only
	PANOCHE1 Section 1D & PANOCHE2 Section 2D 115kV	P2	Bus/Breaker	N/A	3	5	N/A	86	5	101	N/A	5	Sensitivity Only
	PANOCHE-SCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHE2 115KV [3231]	P7	DCTL	28	26	24	84	86	28	101	77	25	Sensitivity Only
34555 JAYNESWSTA 70.0 34578 JACALITO 70.0 1 1	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	108	103	<100	Sensitivity Only
34559 HURONJ 70.0 34560 CALFLAX 70.0 1 1	PANOCHE 230/115kV TB 2 & PANOCHE 230/115kV TB 1	P6	N-1-1	<100	<100	<100	<100	100	<100	153	<100	<100	Short term rating followed by a redispatch
	PANOCHE1 Section 1D & PANOCHE2 Section 2D 115kV	P2	Bus/Breaker	11	15	19	177	177	12	214	169	19	Short term rating followed by a redispatch
	EXCELSIORSS-PANOCHE1 115KV [3250] & EXCELSIORSS-PANOCHE2 115KV [3231]	P7	DCTL	41	36	35	160	166	39	197	161	36	Short term rating followed by a redispatch
	PANOCHE-SCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHE2 115KV [3231]	P7	DCTL	55	54	47	175	177	57	215	168	49	Short term rating followed by a redispatch
	PANOCHE1-EXCELSIORSS 115kV [0] & EXCELSIORSS-PANOCHE2 115kV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	197	161	<100	Sensitivity Only
	HURON_DIST 12kV Gen Unit 1 & EXCELSIORSS-PANOCHE2 115kV [3231]	P3	G1/N1	<100	<100	<100	<100	<100	<100	100	<100	<100	Sensitivity Only
	EXCELSIORSS 115kV - Middle Breaker Bay 2	P2	Bus/Breaker	N/A	29	27	N/A	96	32	130	N/A	28	Sensitivity Only
34561 Q526TP 70.0 34566 PLSNTVLY 70.0 1 1	PANOCHE1 Section 1D & PANOCHE2 Section 2D 115kV	P2	Bus/Breaker	25	26	27	135	129	24	156	141	28	Short term rating followed by a redispatch
	EXCELSIORSS-PANOCHE1 115KV [3250] & EXCELSIORSS-PANOCHE2 115KV [3231]	P7	DCTL	13	11	11	122	121	12	143	135	11	Short term rating followed by a redispatch
	PANOCHE-SCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHE2 115KV [3231]	P7	DCTL	18	22	17	133	129	23	156	141	16	Short term rating followed by a redispatch
	EXCELSIORSS-PANOCHE1 115kV [3250] & EXCELSIORSS-PANOCHE2 115kV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	143	135	<100	Sensitivity Only
34562 SCHINDLR 70.0 34564	PANOCHE1 Section 1D & PANOCHE2 Section 2D 115kV	P2	Bus/Breaker	20	18	20	138	139	16	152	126	20	Short term rating followed by a redispatch
	EXCELSIORSS-PANOCHE1 115KV [3250] & EXCELSIORSS-PANOCHE2 115KV [3231]	P7	DCTL	19	21	20	123	129	22	137	120	20	Short term rating followed by a redispatch

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
34562 SCHINDLER 70.0 34554 SCHINDLR 115 1 1	PANOCHÉ-SCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P7	DCTL	31	37	32	137	139	39	152	126	32	Short term rating followed by a redispatch
	COALINGA #1-SAN MIGUEL 70kV [8580] & GATES 230/70kV TB 5	P6	N-1-1	<100	<100	<100	<100	<100	<100	143	116	<100	Sensitivity Only
	GATES 230kV Section 2D	P2	Bus/Breaker	N/A	59	56	N/A	77	59	105	N/A	59	Sensitivity Only
34562 SCHLNDLR 70.0 34561 Q526TP 70.0 1 1	PANOCHÉ1 Section 1D & PANOCHÉ2 Section 2D 115kV	P2	Bus/Breaker	25	27	27	103	115	25	122	103	29	Short term rating followed by a redispatch
	EXCELSIORSS-PANOCHÉ1 115KV [3250] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P7	DCTL	9	7	7	90	106	8	110	101	7	Short term rating followed by a redispatch
	PANOCHÉ-SCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P7	DCTL	16	19	15	101	115	20	123	104	13	Short term rating followed by a redispatch
	SCHLNDLR-FIVEPOINTSSS #1 70kV [0] & GATES 230/70kV TB 5	P6	N-1-1	<100	<100	<100	<100	<100	<100	138	104	<100	Sensitivity Only
34562 SCHLNDLR 70.0 34567 FIVEPOINTSSS 70.0 1 1	PANOCHÉ1 Section 1D & PANOCHÉ2 Section 2D 115kV	P2	Bus/Breaker	14	10	13	155	144	8	159	127	13	Short term rating followed by a redispatch
	EXCELSIORSS-PANOCHÉ1 115KV [3250] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P7	DCTL	28	32	31	139	134	33	143	120	32	Short term rating followed by a redispatch
	PANOCHÉ-SCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P7	DCTL	41	48	44	153	144	51	159	127	45	Short term rating followed by a redispatch
	PANOCHÉ1-EXCELSIORSS 115kV [0] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	142	120	<100	Sensitivity Only
	Q678 0kV Gen Unit 1 & GATES 230/70kV TB 5	P3	G1/N1	<100	<100	<100	<100	<100	<100	106	<100	<100	Sensitivity Only
	GATES 230/70kV TB 5	P1	N-1	51	44	43	58	73	45	101	79	45	Sensitivity Only
	GATES 230kV Section 2D	P2	Bus/Breaker	N/A	51	49	N/A	82	52	110	N/A	51	Sensitivity Only
34566 PLSNTVLY 70.0 34570 COLNGA 2 70.0 1 1	PANOCHÉ1 Section 1D & PANOCHÉ2 Section 2D 115kV	P2	Bus/Breaker	5	8	6	111	107	8	132	116	7	Short term rating followed by a redispatch
	PANOCHÉ-SCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P7	DCTL	43	42	40	110	107	45	133	116	39	Short term rating followed by a redispatch
	PANOCHÉ1-EXCELSIORSS 115kV [0] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	120	111	<100	Sensitivity Only
	EXCELSIORSS-PANOCHÉ1 115KV [3250] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P7	DCTL	31	29	28	99	99	31	120	111	27	Sensitivity Only
34567 FIVEPOINTSSS 70.0 34560 CALIFAX 70.0 1 1	EXCELSIORSS 115kV - Middle Breaker Bay 2	P2	Bus/Breaker	N/A	27	26	N/A	87	29	117	N/A	28	Short term rating followed by a redispatch
	PANOCHÉ1 Section 1D & PANOCHÉ2 Section 2D 115kV	P2	Bus/Breaker	16	12	16	163	160	11	194	163	15	Short term rating followed by a redispatch
	EXCELSIORSS-PANOCHÉ1 115KV [3250] & EXCELSIORSS-PANOCHÉ2 115KV [3231]	P7	DCTL	30	34	33	148	150	35	179	156	34	Short term rating followed by a redispatch



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
34578 COLNGA 1 70.0 34578 JACALITO 70.0 1 1	PANOCHESCHINDLER #1 115KV [3250] & EXCELSIORSS-PANOCHES2 115KV [3231]	P7	DCTL	42	50	45	162	160	52	195	163	46	Short term rating followed by a redispatch
	PANOCHES1-EXCELSIORSS 115kv [0] & EXCELSIORSS-PANOCHES2 115kv [3231]	P6	N-1-1	<100	<100	<100	<100	<100	<100	178	156	<100	Sensitivity Only
34574 COLNGA 1 70.0 34578 JACALITO 70.0 1 1	GATES 230/70kv TB 5 & SCHINDLER 115/70kv TB 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	103	102	<100	Sensitivity Only
36354 SAN MIGUEL 70.0 34574 COLNGA 1 70.0 1 1	Q877PH3 0kv Gen Unit 3 & GATES 230/70kv TB 5	P3	G1/N1	<100	<100	<100	<100	<100	<100	132	117	<100	Sensitivity Only
	GATES 230/70kv TB 5	P1	N-1	2	4	3	100	87	5	116	113	5	Generation re-dispatch
	GATES 230kv Section 2D	P2	Bus/Breaker	18	N/A	N/A	78	N/A	N/A	N/A	101	N/A	Sensitivity Only
36354 SAN MIGUEL 70.0 36353 ESTRELLA 70.0 1 1	GATES 230/70kv TB 5 & SCHINDLER 115/70kv TB 1	P6	N-1-1	220	185	195	<100	<100	217	<100	<100	212	Operating Solution
364621 JACKSONSWSTA 115 34434 WAUKENA_SS 115 1 1	JACKSONSWSTA-CORCORAN 115kv [2040] & CORCORAN 115/70kv TB 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	142	<100	<100	Sensitivity Only
	JACKSONSWSTA-CORCORAN 115kv [2040]	P1	N-1	N/A	63	80	N/A	100	66	137	N/A	80	Sensitivity Only
	JACKSONSWSTA-Q529TP 115kv [0] No Fault	P2	L1 w/o fault	N/A	57	56	N/A	100	60	138	N/A	56	Sensitivity Only
	KINGSBURG-CORCORAN #1 115kv [2040] (Q529TP-CORCORAN)	P2	L1 w/o fault	N/A	63	80	N/A	100	66	137	N/A	80	Sensitivity Only
	JACKSONSWSTA 115kv - Middle Breaker Bay 1	P2	Bus/Breaker	N/A	63	80	N/A	100	66	137	N/A	80	Sensitivity Only
	Q529TP-Q529 #1 115KV [0] & KINGSBURG-WAUKENA SW STA 115KV [2050]	P7	DCTL	N/A	63	80	N/A	100	66	137	N/A	80	Sensitivity Only
364621 JACKSONSWSTA 115 34436 Q529TP 115 1 1	JACKSONSWSTA-WAUKENA_SS #1 115kv [0] & CORCORAN 115/70kv TB 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	141	<100	<100	Sensitivity Only
	JACKSONSWSTA-WAUKENA_SS #1 115kv [0]	P1	N-1	N/A	57	56	N/A	100	60	137	N/A	56	Sensitivity Only
	JACKSONSWSTA 115kv - Middle Breaker Bay 2	P2	Bus/Breaker	N/A	57	56	N/A	100	60	137	N/A	56	Sensitivity Only
364621 JACKSONSWSTA 115 34428 CONTADNA 115 1 1	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	N/A	91	93	N/A	42	96	56	N/A	101	Sensitivity Only
38615 DS AMIGO 230 30790 PANOCHES 230 1 1	GATES 230/12.47kv TB 4 & GATES 500/230kv TB 11	P6	N-1-1	<100	<100	<100	<100	<100	<100	100	<100	<100	Sensitivity Only
	PANOCHES 230kv - Section 1E & 1D	P2	Bus/Breaker	25	20	26	87	78	22	104	79	27	Sensitivity Only
30805 BORDEN 230 30810 GREGG 230 2 1	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	148	148	155	103	97	153	99	148	157	Protection Upgrade

Study Area: PG&E Greater Fresno

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
ADAMS_E 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
ADAMS_E TP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
AIRPROD 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
AIRWAYJ2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
AIRWAYS 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
ALPAUGH 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
ALPAUGHN_20P 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
ALPAUGHN_50P 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
ALPAUGHN_JCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
ALPAUGHNRTH 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
AMSTG SW 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
ANGIOLA 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.09	<1.05	<1.05	<1.05	1.06	<1.05	
ANTELOPE 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Under Review
ANTLP JC 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
ARBURU T 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	Under Review
ARMSTRNG 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
ARVIN 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
ATWATER 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	1.09	<1.05	<1.05	Under Review
ATWATR J 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	1.09	<1.05	<1.05	Under Review
ATWELL&1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM)
ATWELL_ISL 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
ATWELL_JCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
AUBERRY 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
AUBRYTP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
BALCH 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
BELRDG B 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
BELRDG J 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
BELRDG T 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
BELRIDGE 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM)
BLUSTNPP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	

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Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
BOSWELL 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.09	<1.05	<1.05	<1.05	1.06	<1.05	In-service date: 12/20 Short term: Action plan
BRRNDA A 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
BRRNDA C 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
BSWLL TP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.09	<1.05	<1.05	<1.05	1.06	<1.05	
CAL AVE 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
CAL_TAP3 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
CAL_TAP4 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
CALEVRAS 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
CAMDEN 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	
CARRIZO 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
CARUTHRS 70kV	Base Case	P0	Base case	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.06	<1.05	
CASTLE 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	1.09	<1.05	<1.05	Under Review
CAWELO C 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
CERTAN T 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
CERTANJ1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
CERTANJ2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
CERTTEED 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
CHLME JT 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
CHOLAME 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
CHWCGN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	1.07	<1.05	<1.05	Under Review
CHWCGNJT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
CHWCHLA2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	1.07	<1.05	<1.05	Under Review
CHWCHLASLR 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
CHWCHLASLRJT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	

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Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
CHWCHLLA 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
CLOVIS-1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
CLOVIS-2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
CLOVISJ1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
CLOVISJ2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
CMDN JCT 70kV	Base Case	P0	Base case	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.07	<1.05	
CORCORAN 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.10	<1.05	<1.05	<1.05	1.07	<1.05	
CORCORAN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
CORCORANPV_P 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
CORSGOLD 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	1.06	<1.05	1.07	<1.05	<1.05	Under Review
CRESSEY 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
DANISHCM 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
DEVLDNPP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
DEXZEL 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
DINUBA 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
DISCOVER 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
DNUBAEGY 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
DNUBAJCT 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
DSCVRYTP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
DUNLAP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	
EL CAPTN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	
EL NIDO 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	
GALLO 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	1.09	<1.05	<1.05	Under Review
GATES 115kV	Base Case	P0	Base case	1.10	<1.05	<1.05	1.11	<1.05	<1.05	<1.05	1.10	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
GAURD J1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
GAURD J2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
GIFFEN 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	1.05	<1.05	
GODN_BER 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
GRDNGLS1WB 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
GRDNGLS2EB 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
GUERNSEY 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
GUR3TPT 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
HARDWICK 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	

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Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
HNFRD SW 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
HRDWK TP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
JGBSWLL 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.09	<1.05	<1.05	<1.05	1.06	<1.05	
JR WOOD 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	1.09	<1.05	<1.05	Under Review
JRWD GEN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	1.09	<1.05	<1.05	Under Review
K1-JCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	1.06	<1.05	1.06	<1.05	<1.05	Under Review
KERCKHF1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
KERCKHF2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
KERN OIL 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KERN PWR 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KERNFRNT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
KERNRDGE 115kV	Base Case	P0	Base case	1.06	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	1.06	<1.05	
KERNWATR 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KINGS J1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KINGS J2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KINGSBURGD 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KINGSBURGE 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KNGLOBUS 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KNGSCOGN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KNGSRVR1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KNSBGCGNJCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KRCDP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KRN OL J 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
KRNFRNTT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
LE GRAND 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	1.07	<1.05	<1.05	Under Review
LE GRNDJ 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	1.10	<1.05	<1.05	Under Review
LERDO 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
LIVE OAK 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
LIVNGSTN 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
LIVNGSTN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	1.09	<1.05	<1.05	Under Review
LOSBANOS 230kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review

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Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
LRDO JCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
MAGUNDEN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
MALAGA 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
MALAGATP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
MANCHSTR 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
MC CALL 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.05	<1.05	
MERCED 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	
MIDWAY 115kV	Base Case	P0	Base case	1.05	1.05	<1.05	<1.05	<1.05	1.05	1.05	<1.05	<1.05	Under Review
MOCCASIN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
NRTHFORK 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	
OAKH_JCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	1.06	<1.05	1.06	<1.05	<1.05	Under Review
OAKHURST 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	1.06	<1.05	1.07	<1.05	<1.05	Under Review
OGLE JCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
OGLE TAP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
OLIVE_SS 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
ORION 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
ORIONTP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
ORO LOMAJ1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
OROSI 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
ORSI JCT 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
PARLIER 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
PIEDRA 1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
PIEDRA 2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
POLPASPP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
PONDROAD 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
POSO J2 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
POSO MT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
POSOMTJT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
PPG 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
PSE MCKJ 115kV	Base Case	P0	Base case	1.06	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
PSE MCKT 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.05	<1.05	

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
PTRL JCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
PUMPJACK 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
PUMPJACK_TP 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
Q482 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
Q529 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
Q529TP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
Q557 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
Q558 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
Q577 230kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
Q632B 70kV	Base Case	P0	Base case	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.06	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
Q679 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	1.05	<1.05	
Q972 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
QUEBEC 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.05	<1.05	
QUEBECTP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	Under Review
QUINTO_SS 230kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	
RAINBW 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
RAINBWTP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
RANCHRS 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
RASMSNTP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
RASMUSEN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
REEDLEY 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
REEDLEY 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
RESERVE 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
RIOBRAVO1 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
ROSEDAL 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
S_KERN 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
S_KERN_TP 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
SAN EMDO 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
SANDCRK 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	
SANGER 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
SCWAX 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
SCWAXJCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
SESWTF 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
SESWTFTP 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
SHARON 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
SHARON T 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	1.06	<1.05	<1.05	Under Review
SJNO2 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
SJNO3 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
SMYRNA 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
SNGRCOGN 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
SNGRJCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
STALIONJ 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
STALLION 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
STCKDLJ 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
STCRRL J 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
STOCKDLE 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
STONCRRL 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	
STRD JCT 70kV	Base Case	P0	Base case	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.05	<1.05	
STROUD 70kV	Base Case	P0	Base case	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.06	<1.05	
SUNMAID 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
SUNMAIDJCT 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
SW85 J1 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
SW85 J2 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
TAFT A 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
TAFT_SW_TAFC 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
TAFT_SW_TAFM 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
TEMBLOR 115kV	Base Case	P0	Base case	1.06	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
TEVIS 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
TEVIS2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
TEVISJ1 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
TEVISJ2 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
TVY VLLY 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	<1.05	<1.05	<1.05	
TX_ROSDL 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
ULTPWRJ 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
VEDDER 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
WAHTOKE 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	

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Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
WARNERVL 230kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.07	<1.05	<1.05	Under Review
WAUKENA_SS 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.08	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
WEEDPTCH 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
WESTPARK 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	<1.05	<1.05	<1.05	
WHITERIVER_P 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	1.06	<1.05	
WILSON A 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	1.09	<1.05	<1.05	Under Review
WILSON B 115kV	Base Case	P0	Base case	1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
WISHON 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	
WRIGHT T 70kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	<1.05	<1.05	<1.05	1.05	<1.05	<1.05	Under Review
WST FRSO 115kV	Base Case	P0	Base case	<1.05	<1.05	<1.05	1.06	<1.05	<1.05	<1.05	<1.05	<1.05	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
BER VLLY 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	<1.1	Under Review
BRCEBG J 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	<1.1	Under Review
CANAL 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940]	P1	N-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Monitor future load forecast
DINUBA 70kV	REEDLEY-DINUBA #1 70kV [9050]	P1	N-1	>0.9	0.92	0.91	>0.9	>0.9	0.92	>0.9	>0.9	0.91	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) Turn On Battery In-service date: 05/21
EXCHEQUR 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	<1.1	Under Review
EXCHEQUR 115kV	EXCHEQUER-LE GRAND 115kV [1560]	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	<1.1	Under Review
INDN FLT 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	<1.1	Under Review
MARIPOS2 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.12	<1.1	<1.1	Under Review
MC SWAIN 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.10	<1.1	<1.1	Under Review
MCSWAINJ 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.10	<1.1	<1.1	Under Review
MENDOTA 115kV	PANOCHÉ-MENDOTA 115kV [3230]	P1	N-1	>0.9	>0.9	0.92	>0.9	>0.9	>0.9	>0.9	>0.9	0.91	Monitor future load forecast
MRCDFLLS 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.10	<1.1	<1.1	Under Review
NORTHSTAR 115kV	PANOCHÉ-MENDOTA 115kV [3230]	P1	N-1	>0.9	>0.9	0.92	>0.9	>0.9	>0.9	>0.9	>0.9	0.91	Under Review
SAXONCRK 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	<1.1	Under Review

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Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
YOSEMITE 70kV	EXCHEQUR 70/115kV TB 1	P1	N-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	<1.1	Under Review
ARBURU T 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.98	0.86	NA	>0.9	0.98	>0.9	NA	0.86	Monitor future load forecast
ARBURUA 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.98	0.86	NA	>0.9	0.97	>0.9	NA	0.86	Monitor future load forecast
CANAL 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CANAL-LVNGSTNT)	P2	Bus/Breaker	NA	>0.9	>0.9	NA	>0.9	>0.9	>0.9	NA	>0.9	Under Review
CANAL 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.97	0.78	NA	>0.9	0.96	>0.9	NA	0.78	Monitor future load forecast
CANAL 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (SNTA NLA-LVNGSTNT)	P2	Bus/Breaker	NA	>0.9	>0.9	NA	>0.9	>0.9	>0.9	NA	>0.9	Under Review
CHEVPIPE 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.94	0.77	NA	>0.9	0.93	>0.9	NA	0.77	Monitor future load forecast
LIVNGSTN 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.97	0.78	NA	>0.9	0.96	>0.9	NA	0.78	Monitor future load forecast
LIVNGSTN 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (SNTA NLA-LVNGSTNT)	P2	Bus/Breaker	NA	>0.9	>0.9	NA	>0.9	>0.9	>0.9	NA	>0.9	Under Review
LVNGSTNT 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.96	0.78	NA	>0.9	0.96	>0.9	NA	0.78	Under Review
LVNGSTNT 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (SNTA NLA-LVNGSTNT)	P2	Bus/Breaker	NA	>0.9	>0.9	NA	>0.9	>0.9	>0.9	NA	>0.9	Under Review
MERCYSPRNGSS70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.98	0.84	NA	>0.9	0.97	>0.9	NA	0.84	Monitor future load forecast
MRCYSPRS 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.98	0.83	NA	>0.9	0.97	>0.9	NA	0.83	Monitor future load forecast
ORTIGA 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.98	0.81	NA	>0.9	0.97	>0.9	NA	0.81	Monitor future load forecast
SNTA NLA 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.94	0.77	NA	>0.9	0.93	>0.9	NA	0.77	Monitor future load forecast
VEGA 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] (CHEVPIPE-LOS BANS)	P2	Bus/Breaker	NA	0.98	0.84	NA	>0.9	0.97	>0.9	NA	0.84	Monitor future load forecast
BER VLLY 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.02	1.00	NA	1.11	1.02	1.12	NA	1.00	Under Review

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
BRCEBG J 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.02	1.00	NA	1.11	1.01	1.12	NA	1.00	Under Review
EXCHEQUR 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.03	1.01	NA	1.11	1.02	1.12	NA	1.01	Under Review
EXCHEQUR 115 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.03	1.01	NA	1.12	1.03	1.12	NA	1.01	Under Review
INDN FLT 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.01	0.99	NA	1.11	1.01	1.12	NA	0.99	Under Review
MARIPOS2 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.02	0.99	NA	1.12	1.01	1.13	NA	0.99	Under Review
MC SWAIN 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.04	1.02	NA	1.11	1.04	1.11	NA	1.02	Under Review
MCSWAINJ 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.04	1.02	NA	1.11	1.03	1.11	NA	1.02	Under Review
MRCDFLLS 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.04	1.02	NA	1.11	1.03	1.11	NA	1.02	Under Review
SAXONCRK 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.02	1.00	NA	1.11	1.01	1.12	NA	1.00	Under Review
YOSEMITE 70 kV	LE GRAND 115kV Section MA	P2	Bus/Breaker	NA	1.01	0.98	NA	1.11	1.00	1.12	NA	0.98	Under Review
ATWATER 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.98	0.89	0.95	1.10	1.12	0.87	1.12	1.00	0.95	Under Review
ATWATR J 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.98	0.89	0.95	1.10	1.12	0.87	1.12	1.00	0.95	Under Review
BORDEN 230 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.93	0.87	0.91	1.05	1.07	0.85	1.07	0.95	0.91	Under Review
CASTLE 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.98	0.90	0.95	1.10	1.12	0.87	1.12	1.00	0.95	Under Review
CHSR06A 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	>0.9, <1.1	0.91	0.95	>0.9, <1.1	1.12	0.89	1.12	>0.9, <1.1	0.95	Under Review
CHSR06B 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	>0.9, <1.1	0.91	0.95	>0.9, <1.1	1.12	0.89	1.12	>0.9, <1.1	0.95	Under Review

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
CHSR07A 230 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	>0.9, <1.1	0.88	0.93	>0.9, <1.1	1.07	0.86	1.07	>0.9, <1.1	0.93	Under Review
CHSR07B 230 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	>0.9, <1.1	0.88	0.93	>0.9, <1.1	1.07	0.86	1.07	>0.9, <1.1	0.93	Under Review
CHSR08A 230 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	>0.9, <1.1	0.87	0.92	>0.9, <1.1	1.07	0.85	1.07	>0.9, <1.1	0.92	Under Review
CHSR08B 230 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	>0.9, <1.1	0.87	0.92	>0.9, <1.1	1.07	0.85	1.07	>0.9, <1.1	0.92	Under Review
CRESSEY 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.97	0.88	0.95	1.10	1.12	0.86	1.12	0.99	0.95	Under Review
EL CAPTN 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.99	0.90	0.96	1.10	1.12	0.88	1.12	1.01	0.96	Under Review
EL NIDO 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.99	0.91	0.95	1.11	1.12	0.89	1.12	1.02	0.95	Under Review
GALLO 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.97	0.88	0.95	1.10	1.11	0.85	1.11	0.99	0.95	Under Review
JR WOOD 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.98	0.89	0.95	1.10	1.12	0.87	1.12	1.00	0.95	Under Review
JRWD GEN 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.98	0.89	0.95	1.10	1.12	0.87	1.12	1.00	0.95	Under Review
LE GRNDJ 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.99	0.91	0.96	1.10	1.12	0.89	1.12	1.02	0.96	Under Review
LIVNGSTN 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.97	0.88	0.95	1.10	1.11	0.86	1.12	0.99	0.95	Under Review
MERCED 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.99	0.91	0.96	1.10	1.11	0.89	1.11	1.01	0.96	Under Review
ORO LOMAJ1 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.97	0.89	0.93	1.11	1.13	0.86	1.13	1.01	0.93	Under Review
STOREY 230 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	>0.9, <1.1	0.87	0.92	>0.9, <1.1	1.07	0.85	1.07	>0.9, <1.1	0.92	Under Review
WILSON 230 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	0.96	0.88	0.93	1.05	1.07	0.86	1.07	0.98	0.93	Under Review

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
WILSON A 115 kV	GREGG 230kV - Middle Breaker Bay 1	P2	Bus/Breaker	1.00	0.92	0.97	1.10	1.11	0.90	1.11	1.02	0.97	Under Review
BER VLLY 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.02	1.00	NA	<1.1	1.02	1.12	NA	1.00	Under Review
BRCEBG J 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.02	1.00	NA	<1.1	1.01	1.12	NA	0.99	Under Review
EXCHEQUR 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.03	1.01	NA	<1.1	1.02	1.12	NA	1.01	Under Review
EXCHEQUR 115kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.04	1.01	NA	<1.1	1.03	1.12	NA	1.01	Under Review
INDN FLT 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.01	0.99	NA	<1.1	1.01	1.12	NA	0.99	Under Review
MARIPOS2 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.02	<1.1	NA	<1.1	1.01	1.13	NA	<1.1	Under Review
MC SWAIN 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.04	1.02	NA	<1.1	1.04	1.11	NA	1.02	Under Review
MCSWAINJ 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.04	1.02	NA	<1.1	1.04	1.11	NA	1.02	Under Review
MRCDFLLS 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.04	1.02	NA	<1.1	1.04	1.11	NA	1.02	Under Review
SAXONCRK 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.02	0.99	NA	<1.1	1.01	1.12	NA	0.99	Under Review
YOSEMITE 70kV	LE GRAND - MA 115kV & LE GRAND-CHOWCHILLA line	P2	Bus/Breaker	NA	1.01	0.98	NA	<1.1	1.00	1.12	NA	0.98	Under Review
ATWATER 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.19	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
ATWATR J 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.19	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
CASTLE 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.19	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
CRESSEY 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.19	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
EL CAPTN 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.19	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
GALLO 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.18	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
JR WOOD 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.19	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
JRWD GEN 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.19	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
LIVNGSTN 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.19	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
MERCED 70 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.10	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
MERCED 115 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.18	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
POSO J2 70 kV	WILSON A Section 1D & WILSON B Section 2D 115kV	P2	Bus/Breaker	Diverge	NA	NA	1.10	NA	NA	NA	Diverge	NA	Project: Wilson 115kV Reinforcement Project In-service date: 12/20 Short term: Action plan
ANGIOLA 70 kV	Q558 0kV Gen Unit 1 & JACKSONSWSTA-GWF_HEP 115kV [1743]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	>0.9, <1.1	Under Review
BOSWELL 70 kV	Q558 0kV Gen Unit 1 & JACKSONSWSTA-GWF_HEP 115kV [1743]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	>0.9, <1.1	Under Review

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
BSWLL TP 70 kV	Q558 0kV Gen Unit 1 & JACKSONSWSTA-GWF_HEP 115kV [1743]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	>0.9, <1.1	Under Review
CORCORAN 70 kV	Q558 0kV Gen Unit 1 & JACKSONSWSTA-GWF_HEP 115kV [1743]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	1.10	>0.9, <1.1	>0.9, <1.1	Under Review
JGBSWLL 70 kV	Q558 0kV Gen Unit 1 & JACKSONSWSTA-GWF_HEP 115kV [1743]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	>0.9, <1.1	Under Review
MENDOTA 115 kV	BIO PWR 9kV Gen Unit 1 & PANOCHE-MENDOTA 115kV [3230]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.89	Monitor future load forecast
NORTHSTAR 115 kV	BIO PWR 9kV Gen Unit 1 & PANOCHE-MENDOTA 115kV [3230]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.89	Monitor future load forecast
ASHLAN 230kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.00	1.00	0.94	<1.1	<1.1	1.00	1.10	<1.1	0.92	Protection Upgrade
ATWATER 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.99	0.99	0.94	<1.1	<1.1	0.98	1.12	1.02	0.94	Protection Upgrade
ATWATR J 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.99	0.99	0.94	<1.1	<1.1	0.98	1.12	1.02	0.94	Protection Upgrade
BULLARD 115kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	1.12	<1.1	<1.1	Protection Upgrade
CASTLE 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.00	0.99	0.94	<1.1	<1.1	0.98	1.12	1.02	0.94	Protection Upgrade
CHLDHOSP 115kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.02	1.03	0.97	<1.1	1.10	1.02	1.11	1.04	0.96	Protection Upgrade

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
CHSR06A 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<1.1	1.00	0.93	<1.1	<1.1	1.00	1.12	<1.1	0.93	Protection Upgrade
CHSR06B 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<1.1	1.00	0.93	<1.1	<1.1	1.00	1.12	<1.1	0.93	Protection Upgrade
CRESSEY 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.98	0.98	0.93	<1.1	<1.1	0.97	1.12	1.01	0.93	Protection Upgrade
EL CAPTN 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.00	1.00	0.94	<1.1	<1.1	0.99	1.12	1.03	0.94	Protection Upgrade
EL NIDO 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.00	1.00	0.93	<1.1	<1.1	1.00	1.12	1.03	0.93	Protection Upgrade
GALLO 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.98	0.97	0.93	<1.1	<1.1	0.97	1.12	1.01	0.93	Protection Upgrade
HERNDON 115kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	1.11	<1.1	<1.1	Protection Upgrade
JR WOOD 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.99	0.98	0.94	<1.1	<1.1	0.98	1.12	1.02	0.93	Protection Upgrade
JRWD GEN 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.99	0.98	0.94	<1.1	<1.1	0.98	1.12	1.02	0.93	Protection Upgrade
LE GRNDJ 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.01	1.00	0.94	<1.1	<1.1	1.00	1.12	1.03	0.94	Protection Upgrade
LIVNGSTN 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.98	0.97	0.93	<1.1	<1.1	0.97	1.12	1.01	0.93	Protection Upgrade

Study Area: PG&E Greater Fresno

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
MERCED 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.01	1.00	0.95	<1.1	<1.1	1.00	1.12	1.03	0.94	Protection Upgrade
ORO LOMAJ1 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	0.98	0.98	0.91	<1.1	<1.1	0.98	1.13	1.03	0.91	Protection Upgrade
PNDLJ1 115kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	1.11	<1.1	<1.1	Protection Upgrade
PNDLJ2 115kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	1.11	<1.1	<1.1	Protection Upgrade
PNEDLE 115kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	1.11	<1.1	<1.1	Protection Upgrade
PNEDLE2 115kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	1.11	<1.1	<1.1	Protection Upgrade
WILSON A 115kV	GREGG 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.01	1.01	0.95	<1.1	<1.1	1.01	1.11	1.03	0.95	Protection Upgrade
WOODWARD 115kV	GREGG 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	1.02	1.03	0.97	<1.1	1.10	1.03	1.10	1.03	0.96	Protection Upgrade
EL CAPTN 115 kV	EL CAPITAN-WILSON 115KV [1510] & WILSON-ATWATER #2 115KV [4160]	P7	DCTL	0.94	0.92	0.90	1.09	1.11	0.92	1.11	0.96	0.90	Atwater SPS
ANGIOLA 70kV	KINGSBURGD-JACKSONSWSTA #3 115kV [0] & JACKSONSWSTA-GWF_HEP 115kV [1743]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	1.10	<1.1	1.11	<1.1	<1.1	Under Review
ATWATER 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.13	<1.1	<1.1	Sensitivity Only
ATWATR J 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.13	<1.1	<1.1	Sensitivity Only

Study Area: PG&E Greater Fresno

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
AVENAL 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.70	Diverge	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch/Summer Setup
AVENAL T 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.71	Diverge	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch/Summer Setup
AVNLPARK 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.70	Diverge	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch/Summer Setup
BER VLLY 70kV	PANOCHÉ 230/115kV TB 2 & EXCHEQUR 70/115kV TB 1	P6	N-1-1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	Diverge	1.15	>0.9,<1.1	>0.9,<1.1	Sensitivity Only
BIOMSJCT 70kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	Diverge	>0.9,<1.1	>0.9,<1.1	0.90	Sensitivity Only
BOSWELL 70kV	HERNDON-WOODWARD 115kV [1790] & JACKSONSWSTA-GWF_HEP 115kV [1743]	P6	N-1-1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	Diverge	1.10	>0.9,<1.1	>0.9,<1.1	Sensitivity Only
BRCEBG J 70kV	PANOCHÉ 230/115kV TB 1 & EXCHEQUR 70/115kV TB 1	P6	N-1-1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	Diverge	1.15	>0.9,<1.1	>0.9,<1.1	Sensitivity Only
BSWLL TP 70kV	KINGSBURGD-JACKSONSWSTA #3 115kV [0] & JACKSONSWSTA-GWF_HEP 115kV [1743]	P6	N-1-1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	1.10	Diverge	1.11	>0.9,<1.1	>0.9,<1.1	Under Review
CAL AVE 115kV	MCCALL-WEST FRESNO #2 115kV [2370] & SANGER-CALIFORNIA AVE 115kV [9130]	P6	N-1-1	>0.9,<1.1	>0.9,<1.1	0.85	>0.9,<1.1	>0.9,<1.1	Diverge	>0.9,<1.1	>0.9,<1.1	0.85	Monitor future load forecast
CALFLAX 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.73	Diverge	>0.9,<1.1	>0.9,<1.1	Diverge	>0.9,<1.1	>0.9,<1.1	0.58	Short term rating followed by a redispatch
CASTLE 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	>0.9,<1.1	Diverge	1.13	>0.9,<1.1	>0.9,<1.1	Sensitivity Only
CERTAN T 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Sensitivity Only
CERTANJ1 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Sensitivity Only
CERTANJ2 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Sensitivity Only
CERTTEED 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Sensitivity Only
CHEVPL T 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.71	Diverge	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
CHEVPLIN 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.71	Diverge	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch

Study Area: PG&E Greater Fresno

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
CHSR06A 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.14	<1.1	<1.1	Sensitivity Only
CHSR06B 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.14	<1.1	<1.1	Sensitivity Only
CHWCGN 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.90	Sensitivity Only
CHWCGNJT 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Sensitivity Only
CHWCHLA2 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.90	Sensitivity Only
CHWCHLASLR 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.85	Sensitivity Only
CHWCHLASLRJT 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.85	Sensitivity Only
CHWCHLLA 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Sensitivity Only
COLCGN T 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.78	0.73	>0.9	>0.9	Diverge	>0.9	>0.9	0.64	Short term rating followed by a redispatch
COLNGA 1 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.75	0.69	>0.9	>0.9	Diverge	>0.9	>0.9	0.61	Short term rating followed by a redispatch
COLNGA 2 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.75	0.69	>0.9	>0.9	Diverge	>0.9	>0.9	0.61	Short term rating followed by a redispatch
CORCORAN 70kV	CORCORAN-ANGIOLA 70kV [8600] & WAUKENA SW STA-CORCORAN 115kV [8773]	P6	N-1-1	<1.1	<1.1	<1.1	1.12	<1.1	<1.1	<1.1	<1.1	<1.1	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
CORCORAN 70kV	HERNDON-WOODWARD 115kV [1790] & JACKSONSWSTA-GWF_HEP 115kV [1743]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	1.10	<1.1	1.11	<1.1	<1.1	Project: Wilson Voltage Support (Wilson 115 kV STATCOM) In-service date: 12/20 Short term: Action plan
CRESSEY 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.13	<1.1	<1.1	Sensitivity Only
DAIRYLND 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.84	Sensitivity Only
DANISHCM 115kV	SANGER-CALIFORNIA AVE 115kV [9130] & MCCALL-WEST FRESNO #2 115kV [2370]	P6	N-1-1	>0.9	>0.9	0.86	>0.9	>0.9	>0.9	>0.9	>0.9	0.85	Monitor future load forecast
DERRCK T 70kV	GATES 230/70kV TB 5 & SCHINDLR 115/70kV TB 1	P6	N-1-1	Diverge	0.75	0.70	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch

Study Area: PG&E Greater Fresno

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
DINUBA 70kV	REEDLEY 115/70kV TB 2 & REEDLEY-DINUBA #1 70kV [9050]	P6	N-1-1	>0.9	0.90	0.89	>0.9	>0.9	0.89	>0.9	>0.9	0.89	Monitor future load forecast
EL CAPTN 115kV	WILSON-ATWATER #2 115kV [4160] & EL CAPITAN-WILSON 115kV [1510]	P6	N-1-1	>0.9	>0.9	0.90	>0.9	>0.9	>0.9	>0.9	>0.9	0.90	Sensitivity Only
EL NIDO 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.14	<1.1	<1.1	Sensitivity Only
ELNIDOTP 70kV	PANOCHE 230/115kV TB 2 & EXCHEQUER-LE GRAND 115kV [1560]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.12	<1.1	<1.1	Sensitivity Only
EXCHEQUR 115kV	PANOCHE 230/115kV TB 1 & EXCHEQUER-LE GRAND 115kV [1560]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.15	<1.1	<1.1	Sensitivity Only
FIVEPOINTSSS 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
GALLO 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.13	<1.1	<1.1	Sensitivity Only
GATES 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.70	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
GATS2_TP 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
GILLRAN 115kV	PANOCHE-MENDOTA 115kV [3230] & WILSON-LE GRAND 115kV [4170]	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.80	Monitor future load forecast
GILLTAP 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.80	Monitor future load forecast
HENRIETA 230kV	MUSTANG SW STA-GREGG 230kV [4700] & MUSTANG SW STA-MCCALL 230kV [4710]	P6	N-1-1	0.89	0.89	0.87	>0.9	>0.9	0.90	>0.9	0.88	0.87	FRTSPS
HENTAP2 230kV	MUSTANG SW STA-GREGG 230kV [4700] & MUSTANG SW STA-MCCALL 230kV [4710]	P6	N-1-1	0.89	0.89	0.87	>0.9	>0.9	0.90	>0.9	0.88	0.87	FRTSPS
HURON 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.70	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
HURONJ 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.70	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
INDN FLT 70kV	PANOCHE 230/115kV TB 2 & EXCHEQUER-LE GRAND 115kV [1560]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.14	<1.1	<1.1	Sensitivity Only

Study Area: PG&E Greater Fresno

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
JACALITO 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.74	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
JAYNESWSTA 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
JGBSWLL 70kV	KINGSBURGD-JACKSONSWSTA #3 115kV [0] & JACKSONSWSTA-GWF_HEP 115kV [1743]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	1.10	<1.1	1.10	<1.1	<1.1	Under Review
JRWD GEN 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.13	<1.1	<1.1	Sensitivity Only
KETLMN T 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.71	0.68	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
KETTLEMN 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.71	0.67	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
KPH3_11 230kV	PANOCH 230/115kV TB 2 & WARNERVILLE-WILSON 230kV [5870]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.12	<1.1	<1.1	Sensitivity Only
LE GRAND 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	Sensitivity Only
LE GRNDJ 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.13	<1.1	<1.1	Sensitivity Only
LIVNGSTN 115kV	ATWATER-LIVNGSTN-MERCED 115kV [1030] & WILSON-ATWATER #2 115kV [4160]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	0.90	>0.9	>0.9	>0.9	Sensitivity Only
MADERAPR 115kV	PANOCH 230/115kV TB 1 & EXCHEOUR 70/115kV TB 1	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.80	Monitor future load forecast
MARIPOS2 70kV	PANOCH 230/115kV TB 1 & EXCHEOUR 70/115kV TB 1	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.16	<1.1	<1.1	Sensitivity Only
MC SWAIN 70kV	PANOCH 230/115kV TB 2 & EXCHEQUER-LE GRAND 115kV [1560]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.14	<1.1	<1.1	Sensitivity Only
MCSWAINJ 70kV	PANOCH 230/115kV TB 1 & EXCHEOUR 70/115kV TB 1	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.14	<1.1	<1.1	Sensitivity Only
MENDOTA 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.80	Monitor future load forecast
MERCED 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.13	<1.1	<1.1	Sensitivity Only

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High/Low Voltages

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
MERCYSPRNGSS 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] & LOSBANOS 230/70kV TB 3	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Monitor future load forecast
MRCDFLLS 70kV	PANOCHE 230/115kV TB 1 & EXCHEOUR 70/115kV TB 1	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.14	<1.1	<1.1	Sensitivity Only
MRCYSPRS 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] & LOSBANOS 230/70kV TB 3	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Monitor future load forecast
NEWHALL 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.81	Monitor future load forecast
NORTHSTAR 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.80	Monitor future load forecast
OIL CITYT 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.75	0.73	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
ORO LOMAJ1 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.14	<1.1	<1.1	Sensitivity Only
ORTIGA 70kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940] & LOSBANOS 230/70kV TB 3	P6	N-1-1	>0.9	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	0.88	Monitor future load forecast
PENNZIER 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.75	0.73	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
PENZIR J 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.75	0.73	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
PLSNTVLY 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
PMTFMPP 115kV	PANOCHE-MENDOTA 115kV [3230] & WILSON-LE GRAND 115kV [4170]	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.80	Monitor future load forecast
PMTFMPPJT 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.80	Monitor future load forecast
POSO J2 70kV	GATES 230/12.47kV TB 4 & EXCHEOUR 70/115kV TB 1	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.12	<1.1	<1.1	Sensitivity Only
Q526 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.74	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
Q526TP 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.74	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
Q532 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
Q633 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch

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High/Low Voltages

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
SAXONCRK 70kV	PANOCHE 230/115kV TB 1 & EXCHEQUR 70/115kV TB 1	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.15	<1.1	<1.1	Sensitivity Only
SCHLNDLR 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.73	0.71	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
SHARON 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.90	Sensitivity Only
SHARON T 115kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.90	Sensitivity Only
SUN CITY 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.70	0.67	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
TOMATAK 70kV	ANOCHE-MENDOTA 115kV [3230]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.88	Sensitivity Only
TORNADO 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.77	0.75	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
TORNDO J 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.76	0.74	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
TORNDO T 70kV	SCHINDLR 115/70kV TB 1 & GATES 230/70kV TB 5	P6	N-1-1	Diverge	0.77	0.75	>0.9	>0.9	Diverge	>0.9	>0.9	Diverge	Short term rating followed by a redispatch
VEGA 70kV	LOSBANOS 230/70kV TB 3 & LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940]	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Monitor future load forecast
WARNERVL 230kV	PANOCHE 230/115kV TB 2 & WARNERVILLE-WILSON 230kV [5870]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.11	<1.1	<1.1	Sensitivity Only
WILSON A 115kV	STOREY-BORDEN #1 230kV [0] & BORDEN-STOREY #2 230kV [0]	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.13	<1.1	<1.1	Sensitivity Only
WST FRSO 115kV	SANGER-CALIFORNIA AVE 115kV [9130] & MCCALL-WEST FRESNO #2 115kV [2370]	P6	N-1-1	>0.9	>0.9	0.84	>0.9	>0.9	0.89	>0.9	>0.9	0.83	Monitor future load forecast
YOSEMITE 70kV	PANOCHE 230/115kV TB 1 & EXCHEQUR 70/115kV TB 1	P6	N-1-1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.15	<1.1	<1.1	Sensitivity Only

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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
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Off-Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
MENDOTA 115 kV	PANOCHÉ-MENDOTA 115kV [3230]	P1	N-1	<8	<8	9	<8	<8	<8	<8	<8	10	Monitor future load forecast
NORTHSTAR 115 kV	PANOCHÉ-MENDOTA 115kV [3230]	P1	N-1	<8	<8	9	<8	<8	<8	<8	<8	10	Monitor future load forecast
CANAL 70 kV	LOS BANOS-LIVINGSTON JCT-CANAL 70kV [8940]	P1	N-1	<8	<8	9	<8	<8	<8	<8	<8	9	Monitor future load forecast
DINUBA 70 kV	REEDLEY-DINUBA #1 70kV [9050]	P1	N-1	<8	8	9	<8	<8	9	<8	<8	9	Project: Reedley 70 kV Reinforcement (Dinuba Battery Energy Storage) In-service date: 05/21 Turn On Battery
MENDOTA 115 kV	BIO PWR 9kV Gen Unit 1 & PANOCHÉ-MENDOTA 115kV [3230]	P3	G1/N1	<8	<8	12	<8	<8	<8	<8	<8	12	Monitor future load forecast
NORTHSTAR 115 kV	BIO PWR 9kV Gen Unit 1 & PANOCHÉ-MENDOTA 115kV [3230]	P3	G1/N1	<8	<8	12	<8	<8	<8	<8	<8	12	Monitor future load forecast

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Transient Stability



Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2020 Summer Peak	2028 Summer Peak	2023 Spring Off-Peak	2020 SP Heavy Renewable & Min Gas Gen	2023 SpOP Hi Renew & Min Gas Gen	
Helms unit 1	P1-1	N-1	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Gates 500/230kV Transformer #11	P1-3	T-1	Stable/WECC Criteria Met	Stable/WECC Criteria Not Met	Stable/WECC Criteria Met	Stable/WECC Criteria Not Met	Stable/WECC Criteria Met	Modeling of VER under review
Gates 500/230kV Transformer #12	P1-3	T-1	Stable/WECC Criteria Met	Stable/WECC Criteria Not Met	Stable/WECC Criteria Met	Stable/WECC Criteria Not Met	Stable/WECC Criteria Met	Modeling of VER under review
Wilson 230/115kV TB #1	P1-3	T-2	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Gates 230kV Bus	P2-4	Bus Breaker	Stable/WECC Criteria Not Met	Stable/WECC Criteria Not Met	Stable/WECC Criteria Met	Stable/WECC Criteria Not Met	Stable/WECC Criteria Met	Modeling of VER under review
McCall 230kV Bus	P2-4	Bus Breaker	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Borden 230kV Bus	P2-4	Bus Breaker	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
McCall 115kV Middle breaker	P2-4	Bus Breaker	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
McCall 230kV TB plus Helms unit 1	P3-3	G-1/T-1	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
GREGG 230 KV BAAH BUS #2 with delayed clearing time	P5	Non-Redundant Relay	Stable/WECC Criteria Not Met	Stable/WECC Criteria Not Met	Stable/WECC Criteria Met	Stable/WECC Criteria Not Met	Stable/WECC Criteria Met	Protection Upgrade
Wilson 230/115kV TB #1 & #2	P6	N-1-1	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Bellota-Warnerville 230kV and Warnerville-Wilson 230kV lines	P7-1	DCTL	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Panoche-Tranquility #1 and #2 230kV Lines	P7-1	DCTL	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Gates-McCall 230kV and Helms-McCall 230kV Lines	P7-1	DCTL	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Gregg-Helms #1 and #2 230kV Lines Temporary	P7-1	DCTL	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Gregg-Helms #1 and #2 230kV Lines Permanent	P7-1	DCTL	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Gates-Mustang #1 and #2	P7-1	DCTL	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
Herndon-Barton 115kV Line and Sanger-Manchester 115kV line	P7-1	DCTL	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation
McCall-Reedley 115kV Line and McCall- Sanger #1 115kV Line	P7-1	DCTL	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	Stable/WECC Criteria Met	No Violation

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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 Fresno



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 substation with more than 100 MW load