



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Vaca-Plainfield 60 kV line (32088 32090)	Base Case	P0	N-0	122	115	111	72	19	117	60	11	System Upgrade/ Preferred Resources/Operating Solution as needed
Vaca-Plainfield 60 kV line (32082 32090)	Base Case	P0	N-0	130	122	116	72	20	124	62	13	
Vaca-Plainfield 60 kV line (32082 32092)	Base Case	P0	N-0	131	121	116	72	19	123	62	13	
Weber - Morman Jct. 60 kV Line (33650 33646)	Base Case	P0	N-0	118	119	121	<100	<100	120	<100	<100	System Upgrade/ Preferred Resources/Operating Solution as needed
Rio Oso - Lockeford 230 kV Line (30330 30482)	LOCKFORD 230kV - Ring R3 & R4	P2-3	Non-Bus Tie Breaker Fault	108	<100	<100	36	<100	<100	66	32	- Lockeford - Lodi 230 kV Project - Expected ISD: Dec. 2025 - Short term: Action Plan
	LOCKFORD 230kV - Ring R3 & R2	P2-3	Non-Bus Tie Breaker Fault	108	<100	<100	36	<100	<100	66	32	- Lockeford - Lodi 230 kV Project - Expected ISD: Dec. 2025 - Short term: Action Plan
	LOCKFORD 230/60kV TB 2 & LOCKEFORD-BELLOTA 230kV	P6	N-1-1	108	<100	<100	<100	<100	<100	<100	<100	- Lockeford - Lodi 230 kV Project - Expected ISD: Dec. 2025 - Short term: Action Plan
	LOCKFORD 230/60kV TB 3 & LOCKEFORD-BELLOTA 230kV	P6	N-1-1	108	<100	<100	<100	<100	<100	<100	<100	- Lockeford - Lodi 230 kV Project - Expected ISD: Dec. 2025 - Short term: Action Plan
Woodland - Davis 115 kV Line (31962 31970)	BRIGHTN 115KV SECTION ME	P2-2	Bus Fault	110	68	74	67	1	69	85	17	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	BRIGHTON 230KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	139	80	92	77	3	81	98	21	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	RIO OSO-BRIGHTON 230KV & BRIGHTON-BELLOTA 230KV	P6	N-1-1	142	<100	<100	<100	<100	<100	<100	<100	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	Rio Oso-Brighton 230 kV Line & Rio Oso-Lockeford 230 kV Line	P7	DCTL	102	73	82	45	13	73	59	19	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
Woodland - Davis 115 kV Line (31962 36593)	BRIGHTN 115KV SECTION ME	P2-2	Bus Fault	107	67	72	65	15	67	82	29	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	BRIGHTON 230KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	136	78	90	75	15	79	95	33	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan



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				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
	RIO OSO-BRIGHTON 230KV & BRIGHTON-BELLOTA 230KV	P6	N-1-1	139	<100	<100	<100	<100	<100	<100	<100	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
Woodland - Davis 115 kV Line (36593 31990)	BRIGHTON 230KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	110	78	90	75	11	79	77	40	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	RIO OSO-BRIGHTON 230KV & BRIGHTON-BELLOTA 230KV	P6	N-1-1	112	<100	<100	<100	<100	<100	<100	<100	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
West Sacramento - Brighton 115 kV Line (31978 31984)	RIO OSO 115kV - Section 2D & 1D	P2-4	Bus Tie Breaker Fault	103	101	98	78	4	102	64	28	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
Brighton - Davis 115 kV Line (31984 31983)	BRIGHTN-W.SCRMNO 115KV	P1	N-1	108	87	88	77	11	88	47	38	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	RIO OSO 115kV - Section 2D & 1D	P2-4	Bus Tie Breaker Fault	145	142	131	110	6	144	88	34	SPS recommended in 2017-2018 TPP
	W.SCRMNO - DE 115KV & BRIGHTN-W.SCRMNO LINE	P2-3	Non-Bus Tie Breaker Fault	119	103	108	86	12	105	54	37	
	RIO OSO 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	133	133	116	103	5	134	83	33	
	WOODLAND-DAVIS 115KV & WEST SACRAMENTO-DAVIS 115KV	P6	N-1-1	<100	138	178	107	<100	139	<100	<100	
	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	P7	DCTL	119	103	108	45	11	103	26	22	
Brighton - Davis 115 kV Line (31983 31993)	BRIGHTN-W.SCRMNO 115KV	P1	N-1	108	87	88	78	11	88	47	39	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	RIO OSO 115kV - Section 2D & 1D	P2-4	Bus Tie Breaker Fault	145	142	131	110	6	144	88	35	SPS recommended in 2017-2018 TPP
	RIO OSO 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	133	133	116	103	4	134	83	33	
	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	P7	DCTL	120	103	108	46	11	103	26	23	
Brighton - Davis 115 kV Line (31993 31992)	RIO OSO 115kV - Section 2D & 1D	P2-4	Bus Tie Breaker Fault	122	120	110	93	3	121	74	29	
	RIO OSO 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	112	112	98	86	2	113	69	28	

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				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Brighton-Davis 115 kV Line (31993 32001)	WOODLAND-DAVIS 115KV & WEST SACRAMENTO-DAVIS 115KV	P6	N-1-1	118	116	151	<100	<100	117	<100	<100	
	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	P7	DCTL	101	86	90	45	7	87	25	24	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
Rio Oso 230/115 kV Bank No. 1 (32214 30330)	BRIGHTN - ME 115KV & BRIGHTON-DAVIS LINE	P2-3	Non-Bus Tie Breaker Fault	112	<100	<100	30	<100	<100	68	5	- Rio Oso Transformer Upgrade Project - Expected ISD: Jun. 2024 - Short term: Action Plan
Rio Oso 230/115 kV Bank No. 1 (32214 30330)	FREC 13.80kV Gen Unit 1 & RIO OSO-BRIGHTON 230KV	P3	N-G-1	100	<100	<100	<100	<100	<100	<100	<100	- Rio Oso Transformer Upgrade Project - Expected ISD: Jun. 2024 - Short term: Action Plan
Rio Oso 230/115 kV Bank No. 1 (32214 30330)	BRIGHTON 230KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	103	46	53	33	12	46	79	6	- Rio Oso Transformer Upgrade Project - Expected ISD: Jun. 2024 - Short term: Action Plan
Rio Oso 230/115 kV Bank No. 1 (32214 30330)	BRIGHTON 230/115KV TB 9 & BRIGHTON 230/115KV TB 10	P6	N-1-1	121	<100	<100	<100	<100	<100	<100	<100	- Rio Oso Transformer Upgrade Project - Expected ISD: Jun. 2024 - Short term: Action Plan
Rio Oso 230/115 kV Bank No. 1 (32214 30330)	Rio Oso-Atlantic 230 kV Line & Rio Oso-Gold Hill 230 kV Line	P7	DCTL	125	48	65	82	13	49	52	14	- Rio Oso Transformer Upgrade Project - Expected ISD: Jun. 2024 - Short term: Action Plan
Rio Oso 230/115 kV Bank No. 1 (32214 30330)	Rio Oso-Brighton 230 kV Line & Rio Oso-Lockeford 230 kV Line	P7	DCTL	113	43	54	82	12	43	52	14	- Rio Oso Transformer Upgrade Project - Expected ISD: Jun. 2024 - Short term: Action Plan
Rio Oso 230/115 kV Bank No. 2 (32214 30330)	Rio Oso-Atlantic 230 kV Line & Rio Oso-Gold Hill 230 kV Line	P7	DCTL	105	48	65	82	13	49	36	14	- Rio Oso Transformer Upgrade Project - Expected ISD: Jun. 2024 - Short term: Action Plan
Rio Oso - West Sacramento 115 kV Line (32214 31986)	BRIGHTN 115KV - SECTION ME & MD	P2-4	Bus Tie Breaker Fault	100	79	84	77	6	79	76	30	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	BRIGHTON 230KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	102	91	103	87	9	92	84	33	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
	BRIGHTON 230/115KV TB 9 & BRIGHTON 230/115KV TB 10	P6	N-1-1	121	<100	101	<100	<100	<100	<100	<100	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan
Vaca 115/60 kV transformer #5 (32088 31998)	VACA-DIX 115/60KV TB 9	P1	N-1	108	44	46	31	5	45	64	14	- Vaca Davis Area Reinforcement Project - Expected ISD: Dec. 2025 - Short term: Action Plan

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				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Dixon-Vaca #2 60 kV (32100 32101)	VACA-DXN-DIXON-J1-TRAVIS 60KV MOAS OPENED ON TRAVIS_TRAVISJT	P1	N-1	124	52	57	37	5	52	75	12	- Vaca Davis Area Reinforcement Project - Expected ISD: Dec. 2025 - Short term: Action Plan
Table Mountain-Pease 60 kV Line (Peachton-Gridley) (32326 32332)	PEASE 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	131	126	42	24	39	125	6	6	- East Marysville 115/60 kV Transformer Project - Expected ISD: Dec. 2025 - Short term: Action Plan
Table Mountain-Pease 60 kV Line (Peachton-Gridley) (32326 32334)	PEASE 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	130	125	41	25	38	124	5	7	
Table Mountain-Pease 60 kV Line (Peachton-Gridley) (38054 32334)	PEASE 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	107	102	17	40	44	100	7	8	
Tesla - Salado - Manteca 115 kV Line (33514 33970)	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	191	179	69	37	68	181	158	14	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	SCHULTE SW STA-LAMMERS 115kV & SCHULTE SW STA-KASSON-MANTECA 115kV	P6	N-1-1	215	234	<100	<100	<100	234	157	<100	
	TESLA-SCHULTE SW STA #2 115KV & TESLA-SCHULTE SW STA #1 115KV	P7	DCTL	119	105	20	23	49	116	61	10	
Bellota-Riverbank-Melones 115 kV Line (33562 33950)	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	105	<100	<100	31	<100	<100	102	38	
	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	96	109	86	87	16	108	76	31	
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	104	87	38	31	73	90	102	42	
	SCHULTE SW STA-LAMMERS 115kV & SCHULTE SW STA-KASSON-MANTECA 115kV	P6	N-1-1	118	123	<100	<100	<100	125	<100	<100	
Lockeford - Industrial 60 kV Line (33724 38060)	LOCKFORD 230kV - Ring R3 & R4	P2-3	Non-Bus Tie Breaker Fault	104	<100	<100	40	<100	<100	66	36	- Lockeford - Lodi Area 230 kV Project - Expected ISD: Dec. 2025 - Short term: Action Plan
	LOCKFORD 230kV - Ring R3 & R2	P2-3	Non-Bus Tie Breaker Fault	104	<100	<100	40	<100	<100	67	36	
	LOCKEFORD-LODI #2 60kV (LOCKEFRD-VICTOR)	P2-1	Line Section w/o Fault	103	<100	<100	63	<100	<100	95	55	
	LOCKEFRD-INDUSTRL 60kV & LODI-INDUSTRIAL 60kV	P6	N-1-1	141	<100	<100	<100	<100	<100	141	<100	
Lockeford - Lodi 60 kV Line No. 2 (33735 38060)	LOCKEFORD-INDUSTRIAL 60kV & LODI-INDUSTRIAL 60kV	P6	N-1-1	141	<100	<100	<100	<100	<100	141	<100	
Lodi - Industrial 60 kV Line (38060 33728)	LOCKEFORD-INDUSTRIAL 60kV & LOCKEFRD-INDUSTRL 60kV	P6	N-1-1	176	<100	<100	102	<100	<100	174	102	
Cortina 230/115/60 kV Transformer No. 1 (32056 30451)	CORTINA 230/115KV TB 4	P1	N-1	138	110	103	73	100	117	43	48	Existing operating procedure
	Brighton-Bellota 230 kV Line & Rio Oso-Lockeford 230 kV Line	P7	DCTL	72	91	96	23	7	91	222	171	Sensitivity only

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				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Poe-Rio Oso 230 kV Line (30280 30330)	GOLD HILL-EIGHT MILE ROAD 230KV & GOLD HILL-LODI STIG 230KV	P7	DCTL	71	91	96	23	7	91	222	171	Sensitivity only
	Rio Oso-Brighton 230 kV Line & Rio Oso-Lockeford 230 kV Line	P7	DCTL	71	91	95	23	7	91	222	171	Sensitivity only
Rio Oso - Atlantic 230 kV Line No. 1 (30330 30335)	RIO OSO-GOLD HILL 230kV	P1	N-1	80	79	105	21	14	79	66	17	Continue to monitor future forecast
	GOLDHILL - 2D 230kV & MIDDLE FORK-GOLD HILL line	P2-3	Non-Bus Tie Breaker Fault	99	97	114	39	15	97	81	29	Continue to monitor future forecast
	GOLDHILL 230kV Section 2D	P2-2	Bus Fault	99	97	114	39	15	97	81	29	Continue to monitor future forecast
Vaca - Lambie 230 kV Line (30460 30 30)	BDLSWSTA 230KV - MIDDLE BREAKER BAY 2	P2-3	Non-Bus Tie Breaker Fault	<100	91	102	<100	26	91	<100	<100	Continue to monitor future forecast
Rio Oso - Woodland 115 kV No. 2 (31964 31968)	WEST SACRAMENTO-DAVIS 115KV & RIO OSO-WOODLAND #1 115KV	P6	N-1-1	<100	<100	110	<100	<100	<100	<100	<100	Continue to monitor future forecast
Rio Oso - Woodland 115 kV No. 1 (31965 31966)	WEST SACRAMENTO-DAVIS 115KV & RIO OSO-WOODLAND #2 115KV	P6	N-1-1	<100	<100	102	<100	<100	<100	<100	<100	Continue to monitor future forecast
Rio Oso - Woodland 115 kV No. 2 (31968 31970)	WEST SACRAMENTO-DAVIS 115KV & RIO OSO-WOODLAND #1 115KV	P6	N-1-1	<100	<100	102	<100	<100	<100	<100	<100	Continue to monitor future forecast
West Sacramento - Davis 115 kV Line (31980 31986)	BRIGHTON-DAVIS 115KV MOAS OPENED ON HOWARDJCT3_BRKRJCT & WOODLAND-DAVIS 115KV	P6	N-1-1	<100	<100	110	<100	<100	<100	<100	<100	Continue to monitor future forecast
West Sacramento - Davis 115 kV Line (31980 31990)	BRIGHTON-DAVIS 115KV MOAS OPENED ON HOWARDJCT3_BRKRJCT & WOODLAND-DAVIS 115KV	P6	N-1-1	<100	<100	108	<100	<100	<100	<100	<100	Continue to monitor future forecast
Brighton - Davis 115 kV Line (32001 31990)	WOODLAND-DAVIS 115KV & WEST SACRAMENTO-DAVIS 115KV	P6	N-1-1	<100	<100	122	<100	<100	<100	<100	<100	Continue to monitor future forecast
Vaca - Suisun - Jameson 115 kV Line (31998 31997)	VACA-VACAVILLE-JAMESON-NORTH TOWER 115KV MOAS OPENED ON HALE J1_HALE & VACA-SUISUN 115KV MOAS OPENED ON VACA-DIX_WEC (2)	P6	N-1-1	<100	<100	116	<100	<100	103	<100	<100	Continue to monitor future forecast
Placer - Gold Hill 115 kV Line No. 2 (32018 32231)	PLACER-GOLD HILL #1 115kV & DRUM-HIGGINS 115kV MOAS OPENED on CHCGO PK_HIGGINS	P6	N-1-1	<100	<100	113	<100	<100	<100	<100	<100	Continue to monitor future forecast
Dixon-Vaca #2 60 kV (32101 32109)	DIXON-VACA #1 60KV (VACA-DXN-VACA-JT1)	P2-1	Line Section w/o Fault	<100	101	107	<100	27	101	<100	<100	Continue to monitor future forecast
Dixon-Vaca #2 60 kV (32109 32094)	DIXON-VACA #1 60KV (VACA-DXN-VACA-JT1)	P2-1	Line Section w/o Fault	96	100	106	59	27	102	63	33	Continue to monitor future forecast
Rio Oso - Woodland 115 kV No. 2 (32214 31964)	RIO OSO-BRIGHTON 230KV & RIO OSO-WOODLAND #1 115KV	P6	N-1-1	<100	<100	111	<100	<100	<100	<100	<100	Continue to monitor future forecast
Rio Oso - Woodland 115 kV No. 1 (32214 31965)	RIO OSO-BRIGHTON 230KV & RIO OSO-WOODLAND #2 115KV	P6	N-1-1	<100	<100	100	<100	<100	<100	<100	<100	Continue to monitor future forecast



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Drum - Higgins 115 kV Line (32218 32220)	GOLDHILL - 2D 230kV & MIDDLE FORK-GOLD HILL line	P2-3	Non-Bus Tie Breaker Fault	98	93	110	16	12	93	60	27	Continue to monitor future forecast
	GOLDHILL 230kV Section 2D	P2-2	Bus Fault	98	93	110	16	12	93	60	27	Continue to monitor future forecast
	Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	123	123	186	26	31	127	35	19	System Upgrade/ Preferred Resources/Operating Solution as needed
	Rio Oso-Atlantic 230 kV Line & Rio Oso-Gold Hill 230 kV Line	P7	DCTL	<100	98	124	26	9	98	35	19	Continue to monitor future forecast
Drum - Higgins 115 kV Line (32220 32224)	Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	80	80	116	8	17	82	56	35	Continue to monitor future forecast
Drum - Higgins 115 kV Line (32224 32232)	Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	93	104	137	42	17	106	83	74	System Upgrade/ Preferred Resources/Operating Solution as needed
	Atlantic-Gold Hill 230 kV Line & Rio Oso-Gold Hill 230 kV Line	P7	DCTL	78	88	101	42	3	88	83	74	Continue to monitor future forecast
Placer - Bell 115 kV Line (32228 32238)	Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	70	84	113	5	18	86	38	59	Continue to monitor future forecast
Higgins - Bell 115 kV Line (32232 32238)	Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	84	96	128	22	17	98	60	67	Continue to monitor future forecast
Eldorado - Missouri Flat 115 kV No. 1 Line (32250 32482)	MISSOURI FLAT-GOLD HILL #1 115kV (SHPRING1-CLRKSVLT)	P2-1	Line Section w/o Fault	94	92	102	56	23	93	43	10	Continue to monitor future forecast
	MISSOURI FLAT-GOLD HILL #1 115kV (GOLDHILL-CPM TAP)	P2-1	Line Section w/o Fault	94	91	101	56	23	93	43	10	Continue to monitor future forecast
Eldorado - Missouri Flat 115 kV No. 2 Line (32250 32481)	MISSOURI FLAT-GOLD HILL #1 115kV (SHPRING1-CLRKSVLT)	P2-1	Line Section w/o Fault	94	99	107	49	27	101	33	11	Continue to monitor future forecast
	MISSOURI FLAT-GOLD HILL #1 115kV (GOLDHILL-CPM TAP)	P2-1	Line Section w/o Fault	93	99	107	49	28	101	33	11	Continue to monitor future forecast
Eldorado - Missouri Flat 115 kV No. 2 Line (32481 32257)	MISSOURI FLAT-GOLD HILL #1 115kV (SHPRING1-CLRKSVLT)	P2-1	Line Section w/o Fault	94	99	107	49	27	101	33	11	Continue to monitor future forecast
	MISSOURI FLAT-GOLD HILL #1 115kV (GOLDHILL-CPM TAP)	P2-1	Line Section w/o Fault	93	99	107	49	28	101	33	11	Continue to monitor future forecast
Colgate - Smartville 60 kV Line No. 2 (32308 32313)	RIO OSO-WOODLAND #2 115KV & COLGATE-SMARTVILLE #1 60kV MOAS OPENED on COLGATE_NRRWS1TP	P6	N-1-1	<100	<100	103	<100	<100	<100	<100	<100	Continue to monitor future forecast
Masysville-Plumas 60 kV Line (32320 32344)	PEASE-MARYSVILLE-HARTER 60kV	P1	N-1	104	105	<100	35	14	105	60	15	Disable Automatics
	E.MRYSVE-MRYSVLE #1 60kV	P1	N-1	<100	<100	121	<100	<100	<100	<100	<100	Disable Automatics
Pease - Marysville - Harter 60 kV Line (32332 32333)	RIO OSO-NICOLAUS 115kV & PALERMO-NICOLAUS 115kV MOAS OPENED on PALERMO_E.MRY J2	P6	N-1-1	<100	<100	123	<100	<100	<100	<100	<100	Continue to monitor future forecast
Pease - Marysville - Harter 60 kV Line (32333 32325)	PEASE 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	<100	<100	117	24	<100	<100	<100	13	Continue to monitor future forecast

Study Area: PG&E Central Valley

Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Nicolaus - Marysville 60 kV Line (Plumas-East Nicolaus) (32342 32344)	E.MRYSVE-MRYSVLE #1 60kV	P1	N-1	<100	<100	191	<100	<100	<100	<100	<100	Continue to monitor future forecast
	PEASE-MARYSVILLE-HARTER 60kV	P1	N-1	167	168	<100	29	25	170	76	22	Disable Automatics
Lincoln - Pleasant Grove 115 kV Line (32356 32398)	RIO OSO-ATLANTIC 230kV & ATLANTIC-GOLD HILL 230kV	P6	N-1-1	<100	<100	119	<100	<100	<100	<100	<100	Continue to monitor future forecast
	Rio Oso-Atlantic 230 kV Line & Rio Oso-Gold Hill 230 kV Line	P7	DCTL	64	81	115	4	12	81	25	14	Continue to monitor future forecast
Lincoln - Pleasant Grove 115 kV Line (32356 32404)	ATLANTIC-GOLD HILL 230kV & RIO OSO-ATLANTIC 230kV	P6	N-1-1	128	121	145	<100	<100	122	<100	<100	Operating Procedure
	Rio Oso-Atlantic 230 kV Line & Rio Oso-Gold Hill 230 kV Line	P7	DCTL	91	109	146	33	19	110	46	17	Continue to monitor future forecast
Lincoln - Pleasant Grove 115 kV Line (32398 32408)	ATLANTIC-GOLD HILL 230kV & RIO OSO-ATLANTIC 230kV	P6	N-1-1	111	105	127	<100	<100	105	<100	<100	Operating Procedure
	Rio Oso-Atlantic 230 kV Line & Rio Oso-Gold Hill 230 kV Line	P7	DCTL	75	93	128	6	15	93	47	35	Continue to monitor future forecast
RIO OSO-SPI JCT 115 kV (32214 32404)	ATLANTIC-GOLD HILL 230kV & RIO OSO-ATLANTIC 230kV	P6	N-1-1	125	119	141	<100	<100	120	<100	<100	Operating Procedure
RIO OSO-SPI JCT 115 kV (32214 32404)	Rio Oso-Atlantic 230 kV Line & Rio Oso-Gold Hill 230 kV Line	P7	DCTL	90	107	144	40	19	108	40	10	Continue to monitor future forecast
Spaulding - Summit 60 kV Line (32365 30993)	BRNSWALT 115kV - Ring R5 & R6	P2-3	Non-Bus Tie Breaker Fault	101	102	104	46	12	99	56	120	Continue to monitor future forecast
	BRNSWALT 115kV - Ring R7 & R6	P2-3	Non-Bus Tie Breaker Fault	101	102	104	46	12	99	56	120	Continue to monitor future forecast
64109 SUMMIT 3 60.0 30993 SUMMIT 60.0 1 1	BRNSWALT 115kV - Ring R5 & R6	P2-3	Non-Bus Tie Breaker Fault	<100	99	103	43	12	95	<100	117	Continue to monitor future forecast
	BRNSWALT 115kV - Ring R7 & R6	P2-3	Non-Bus Tie Breaker Fault	<100	99	103	43	12	95	<100	117	Continue to monitor future forecast
Drum - Grass Valley - Weimar 60 kV Line (32367 32369)	ROLLINSF 6.60kV Gen Unit 1 & COLGATE-GRASS VALLEY 60kV	P3	N-G-1	<100	<100	100	<100	<100	<100	<100	<100	Continue to monitor future forecast
Drum - Grass Valley - Weimar 60 kV Line (32374 32376)	ROLLINSF 6.60kV Gen Unit 1 & COLGATE-GRASS VALLEY 60kV	P3	N-G-1	108	106	114	<100	<100	109	<100	<100	Disable Automatics
Drum - Grass Valley - Weimar 60 kV Line (32376 32367)	ROLLINSF 6.60kV Gen Unit 1 & COLGATE-GRASS VALLEY 60kV	P3	N-G-1	102	101	110	<100	<100	103	<100	<100	Disable Automatics
Drum 115/60 kV Transformer No. 1 (32374 32242)	RIO OSO-DRUM-BRUNSWCK 115kV & DRUM-HIGGINS 115kV MOAS OPENED on CHCGO PK_HIGGINS	P6	N-1-1	102	104	106	<100	<100	102	<100	121	Disable Automatics
BRDSLY J-SPRNG GJ 115 kV (33902 33912)	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	98	86	104	<100	30	87	<100	71	SPS recommended in 2019-2020 TPP
	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	<100	<100	102	<100	<100	<100	<100	<100	Continue to monitor future forecast
	Base Case	P0	N-0	100	100	100	<100	54	100	<100	89	Continue to monitor future forecast



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Spring Gap-MI-WUK 115 kV Line (33912 33914)	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	124	109	130	<100	49	110	<100	78	SPS recommended in 2019-2020 TPP
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	104	94	90	<100	47	94	<100	78	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	122	110	<100	<100	<100	110	<100	<100	SPS recommended in 2019-2020 TPP
MI-WUK-FBERBORD 115 kV (33914 33917)	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	115	102	121	9	50	102	<100	74	SPS recommended in 2019-2020 TPP
	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	112	102	119	<100	<100	102	<100	<100	SPS recommended in 2019-2020 TPP
CURTISS-MI-WUK 115 kV (33916 33917)	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	116	104	122	6	52	105	8	77	SPS recommended in 2019-2020 TPP
	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	114	104	120	<100	<100	104	<100	<100	SPS recommended in 2019-2020 TPP
Stanislaus-Melones-Manteca 115 kV Line No. 1 (33932 33500)	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	149	140	<100	33	36	142	91	25	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	102	103	123	191	100	102	133	38	SPS recommended in 2019-2020 TPP
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	148	139	63	34	13	142	91	21	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	101	102	122	<100	<100	103	<100	<100	SPS recommended in 2019-2020 TPP
Bellota-Riverbank-Melones 115 kV Line (33932 33934)	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	155	125	<100	23	39	129	134	41	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	145	175	132	163	49	173	130	28	SPS recommended in 2019-2020 TPP
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	154	124	55	22	71	128	134	46	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	145	174	134	100	<100	174	<100	<100	SPS recommended in 2019-2020 TPP
Stanislaus - Melones Sw 115 kV Line (33932 33936)	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	146	137	<100	33	33	140	88	26	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	100	100	119	199	97	100	131	39	SPS recommended in 2019-2020 TPP
	STANISLS 13.80kV Gen Unit 1 & MANTECA-RIPON 115kV	P3	N-G-1	101	104	107	<100	<100	107	<100	<100	Continue to monitor future forecast



Study Area: PG&E Central Valley

Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	145	137	60	34	9	139	88	22	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	<100	<100	117	100	<100	101	<100	<100	SPS recommended in 2019-2020 TPP
Stanislaus - Melones Sw 115 kV Line (33936 33947)	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	155	149	<100	14	56	152	68	59	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	60	50	96	129	105	50	104	69	SPS recommended in 2019-2020 TPP
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	154	149	83	14	37	151	68	56	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	TESLA-SCHULTE SW STA #2 115KV & TESLA-SCHULTE SW STA #1 115KV	P7	DCTL	105	96	54	2	46	102	14	39	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
Riverbank Jct - Manteca 115 kV Line (33947 33951)	MANTECA-RIPON 115kV	P1	N-1	109	120	117	56	23	121	67	13	Operating Procedure
	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	149	143	<100	13	53	145	65	56	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	RPNJ2-RIPON 115kV No Fault	P2-1	Line Section w/o Fault	108	120	117	56	23	121	67	13	Reconductor overloaded line
	RIPON-MANTECA 115kV (RPNJ2-MANTECA)	P2-1	Line Section w/o Fault	108	119	117	56	22	121	67	13	Reconductor overloaded line
	MANTECA 115kV - Ring R4 & R5	P2-3	Non-Bus Tie Breaker Fault	107	<100	117	56	<100	<100	66	13	Reconductor overloaded line
	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	57	46	91	123	100	46	99	65	SPS recommended in 2019-2020 TPP
	MANTECA 115kV - Ring R6 & R5	P2-3	Non-Bus Tie Breaker Fault	<100	120	117	<100	22	121	<100	<100	Reconductor overloaded line
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	148	143	80	13	35	145	66	53	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
Bellota Riverbank Melones 115 kV Line	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	187	213	172	163	33	212	130	46	SPS recommended in 2019-2020 TPP
	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	126	95	<100	22	62	100	134	57	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Belota-Riverbank-Meriones 115 kV Line (33950 33934)	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	125	95	36	22	94	99	134	62	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	186	213	174	107	<100	212	<100	<100	SPS recommended in 2019-2020 TPP
	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Fault	91	104	87	77	17	104	55	16	SPS recommended in 2019-2020 TPP
Tesla - Salado - Manteca 115 kV Line (33959 33970)	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	174	158	<100	44	49	160	128	23	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	173	157	72	44	86	159	128	29	
	SCHULTE SW STA-LAMMERS 115kV & SCHULTE SW STA-KASSON-MANTECA 115kV	P6	N-1-1	197	204	<100	<100	<100	205	138	<100	
	TESLA-SCHULTE SW STA #2 115KV & TESLA-SCHULTE SW STA #1 115KV	P7	DCTL	118	99	32	27	70	110	27	25	
Tesla - Salado 115 kV Line No. 1 (33962 33964)	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	124	108	<100	27	33	109	95	2	
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	124	107	58	27	57	109	95	6	
	LAMMERS-KASSON 115kV & SCHULTE SW STA-KASSON-MANTECA 115kV	P6	N-1-1	128	127	<100	<100	<100	128	<100	<100	
Tesla - Salado - Manteca 115 kV Line (33965 33964)	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	113	110	<100	11	28	112	116	34	
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	113	110	34	11	6	111	116	30	
Tesla - Salado - Manteca 115 kV Line (33970 33965)	TESLA-SALADO #1 115kV (TCHRT_T1-MDSTO CN)	P2-1	Line Section w/o Fault	Cont not found	4	Cont not found	Cont not found	105	5	Cont not found	Cont not found	
	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	121	117	<100	12	30	119	123	36	
	KASSON 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	120	117	37	12	7	119	123	32	
	SCHULTE SW STA-LAMMERS 115kV & SCHULTE SW STA-KASSON-MANTECA 115kV	P6	N-1-1	127	152	<100	<100	<100	152	<100	<100	
Salado-Newman 115 kV Line (34000 34016)	SALADO-NEWMAN #2 60kV MOAS OPENED on CRWS LDG_CRWS LDJ	P1	N-1	<100	95	104	<100	27	97	<100	<100	
	SALADO-NEWMAN #2 60kV (PATTERSN-CRWS LDJ)	P2-1	Line Section w/o Fault	102	103	113	66	29	107	41	16	
	SALADO-NEWMAN #2 60kV (SALADO-PATTERSN)	P2-1	Line Section w/o Fault	102	103	113	66	28	107	41	16	



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
34000-MEDLIN 60 kV (34000-34018)	SALADO-NEWMAN #2 60kV (CRWS LDJ-GUSTN JT)	P2-1	Line Section w/o Fault	93	95	104	61	27	97	37	15	Existing operating procedure
	SALADO-NEWMAN #2 60kV (GUSTN JT-NEWMAN)	P2-1	Line Section w/o Fault	93	95	104	61	27	97	37	15	
	SALADO-CROW CREEK SW STA 60kV (SALADO-STNSLSRP)	P2-1	Line Section w/o Fault	47	106	49	35	80	106	94	73	
Crow Creek Sw St-Newman 60 kV Line (34014 34018)	SALADO-CROW CREEK SW STA 60kV (SALADO-STNSLSRP)	P2-1	Line Section w/o Fault	14	83	12	14	106	82	90	88	
Lawrence Lab 115 kV Tap #1 (37649 33574)	TESLA D 230kV Section 2D	P2-2	Bus Fault	36	31	15	28	100	37	33	103	Sensitivity only
NA	TESLA 115kV - Section 2D & 1D	P2-4	Bus Tie Breaker Fault	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	System Upgrade/ Preferred Resources/Operating Solution as needed
NA	GOLDHILL 230/115kV TB 1 & GOLDHILL 230/115kV TB 2	P6	N-1-1	Diverge	Diverge	<100	Diverge	<100	Diverge	<100	<100	- Gold Hill 230/115 kV Transformer Additoin Project - Expected ISD: Dec. 2026 - Short term: Action Plan
NA	TESLA 115kV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5-5	Non-Redundant Relay	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	System Upgrade/ Preferred Resources/Operating Solution as needed

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Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
BRKR SLG 115 kV	BRIGHTN 115KV SECTION ME	P2-2	Bus Fault	0.89	0.99	0.92	0.99	1.06	0.99	0.95	1.03	- Rio Oso Transformer Upgrade and SVC Projects - Expected ISD: Jun. 2024 - Short term: Action Plan - Continue to monitor the long term issue
DAVIS 115 kV		P2-2	Bus Fault	0.89	0.99	0.92	0.99	1.06	0.99	0.95	1.02	
DEEPWATR 115 kV		P2-2	Bus Fault	0.90	1.00	0.93	1.00	1.06	1.00	0.96	1.03	
POST 115 kV		P2-2	Bus Fault	0.90	1.00	0.93	1.00	1.06	1.00	0.96	1.03	
DEEPWATR 115 kV	BRIGHTON 230/115KV TB 10 & BRIGHTON 230/115KV TB 9	P6	N-1-1	0.84	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
ZAMORA 115 kV		P6	N-1-1	0.90	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	
BRKR SLG 115 kV		P6	N-1-1	0.84	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
DAVIS 115 kV		P6	N-1-1	0.84	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
GRAND IS 115 kV		P6	N-1-1	0.81	>0.9	0.85	>0.9	>0.9	>0.9	>0.9	>0.9	
POST 115 kV		P6	N-1-1	0.84	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
W.SCRMNO 115 kV		P6	N-1-1	0.84	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
WOODLD 115 kV		P6	N-1-1	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	
ZAMORA 115 kV		P6	N-1-1	0.90	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	
DEEPWATR 115 kV	BRIGHTON 230KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.89	1.00	0.86	0.98	1.07	1.00	0.93	1.03	
GRAND IS 115 kV		P5	Non-Redundant Relay	0.87	1.02	0.84	0.96	1.08	1.01	0.92	1.02	
POST 115 kV		P5	Non-Redundant Relay	0.90	1.01	0.87	0.98	1.07	1.00	0.93	1.03	
W.SCRMNO 115 kV		P5	Non-Redundant Relay	0.90	1.01	0.87	0.98	1.07	1.00	0.93	1.03	
MOBILCHE 115 kV	BRIGHTON-DAVIS 115KV MOAS OPENED ON HOWARDJCT3_BRKRJCT & WEST SACRAMENTO-DAVIS 115KV	P6	N-1-1	0.89	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
DIST2047 60 kV	CORTINA 115/60KV TB 5	P1	N-1	0.91	0.91	0.88	0.95	0.96	0.91	0.94	0.97	Continue to monitor future forecast
WILKINS 60 kV		P1	N-1	0.93	0.93	0.90	0.96	0.99	0.93	0.96	0.98	
MERIDIAN 60 kV	CORTINA 115/60KV TB 5 & CORTINA #4 60KV	P6	N-1-1	>0.9	>0.9	0.90	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
DUNNIGAN 60 kV	CORTINA 230KV - RING R2 & R3	P2-3	Non-Bus Tie Breaker Fault	>0.9	0.98	0.90	>0.9	1.06	0.99	>0.9	>0.9	Continue to monitor future forecast
DUNNIGAN 60 kV	CORTINA 230KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.97	0.99	0.90	0.99	1.06	0.99	1.02	1.05	Continue to monitor future forecast
GUSTINE 60 kV	CROW CREEK SW STA-FRONTIER SOLAR PV 60kV	P1	N-1	>0.9	0.96	0.86	>0.9	1.07	0.96	>0.9	>0.9	Continue to monitor future forecast
NEWMAN 60 kV		P1	N-1	>0.9	0.98	0.89	>0.9	1.07	0.98	>0.9	>0.9	
NEWMAN 60 kV	CROW CREEK SW STA-NEWMAN 60kV (MEDLIN J-NWMN JCT)	P2-1	Line Section w/o Fault	0.96	0.97	0.89	0.97	1.06	0.96	1.03	1.02	Continue to monitor future forecast
MRYSVLLE 60 kV	E.MRYSVE-MRYSVLLE #1 60kV	P1	N-1	>0.9	>0.9	0.86	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
INGRM C. 115 kV	KASSON - 1D 115kV & SCHULTE SW STA-KASSON-MANTECA line	P2-3	Non-Bus Tie Breaker Fault	0.80	0.86	>0.9	>0.9	1.04	0.85	>0.9	>0.9	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
WESTLEY 60 kV	KASSON 115/60kV TB 1	P1	N-1	0.77	0.82	0.75	0.96	1.03	0.81	0.89	0.98	Kasson SPS
CH.STN 115 kV	KASSON 115KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.81	0.90	0.96	1.00	1.04	0.90	0.85	1.03	- Vierra Looping in Project - Expected ISD: Dec. 2026
INGRM C. 115 kV		P5	Non-Redundant Relay	0.80	0.86	0.93	1.03	1.04	0.86	0.88	1.04	
PEORIA 115 kV		P5	Non-Redundant Relay	0.81	0.90	0.95	1.01	1.04	0.89	0.85	1.03	

Study Area: PG&E Central Valley

Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
R.TRACK 115 kV	RANCHO SECO 115KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.80	0.88	0.95	1.01	1.04	0.88	0.84	1.03	- Short term: Action Plan - Continue to monitor the long term issue
SPRNG GP 115 kV		P5	Non-Redundant Relay	0.88	0.98	1.01	1.00	1.05	0.98	0.84	1.04	
VALLY HM 115 kV		P5	Non-Redundant Relay	0.63	0.73	0.87	1.01	1.03	0.72	0.75	1.02	
DEL MAR 60 kV	MIDDLE FORK-GOLD HILL 230kV	P1	N-1	0.95	0.98	0.87	1.05	1.10	0.98	0.99	1.06	Continue to monitor future forecast
ROCKLIN 60 kV		P1	N-1	0.97	0.99	0.90	1.05	1.09	0.99	0.99	1.06	
SIERRAPI 60 kV		P1	N-1	0.95	0.98	0.87	1.05	1.10	0.98	0.99	1.06	
CPM 115 kV	MISSOURI FLAT-GOLD HILL #1 115kV (GOLDHILL-CPM TAP)	P2-1	Line Section w/o Fault	0.93	0.95	0.87	0.99	1.08	0.94	0.99	1.03	Continue to monitor future forecast
SHPRING 115 kV	MISSOURI FLAT-GOLD HILL #1 115kV (SHPRING1-CLRKSVLT)	P2-1	Line Section w/o Fault	0.93	0.95	0.87	0.99	1.08	0.94	0.99	1.03	Continue to monitor future forecast
E.MRYSVE 115 kV	PALERMO-NICOLAUS 115kV (E.MRYSVE-E.MRY J2)	P2-1	Line Section w/o Fault	>0.9	>0.9	0.87	1.06	>0.9	>0.9	>0.9	1.12	Continue to monitor future forecast
BARRY 60 kV	PALERMO-NICOLAUS 115kV MOAS OPENED on PALERMO_E.MRY J2 & RIO OSO-NICOLAUS 115kV	P6	N-1-1	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
CATLETT 60 kV		P6	N-1-1	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	
DIST1500 60 kV		P6	N-1-1	>0.9	>0.9	0.84	>0.9	>0.9	>0.9	>0.9	>0.9	
E.MRYSVE 115 kV		P6	N-1-1	>0.9	>0.9	0.78	>0.9	>0.9	>0.9	>0.9	>0.9	
E.NICOLS 115 kV		P6	N-1-1	>0.9	>0.9	0.73	>0.9	>0.9	>0.9	>0.9	>0.9	
TUDOR 60 kV		P6	N-1-1	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	
ENCINAL 60 kV	PEACHTON-PEASE 60kV (ENCL TAP-PEASE)	P2-1	Line Section w/o Fault	0.94	0.99	0.88	0.99	1.01	0.99	0.99	1.01	Continue to monitor future forecast
LIVE OAK 60 kV		P2-1	Line Section w/o Fault	0.94	0.99	0.88	0.99	1.01	0.99	0.99	1.01	
BELL PGE 115 kV	PLACER-GOLD HILL #1 115kV & DRUM-HIGGINS 115kV MOAS OPENED on CHCGO PK_HIGGINS	P6	N-1-1	>0.9	>0.9	0.83	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
FLINT 115 kV		P6	N-1-1	>0.9	>0.9	0.85	>0.9	>0.9	>0.9	>0.9	>0.9	
HIGGINS 115 kV		P6	N-1-1	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	
PLACER 115 kV	PLACER-GOLD HILL #1 115kV & PLACER-GOLD HILL #2 115kV	P6	N-1-1	>0.9	>0.9	0.83	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
AUBURN 60 kV		P6	N-1-1	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	
HALSEY 60 kV		P6	N-1-1	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	
PLACER 115 kV	Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	0.89	0.86	0.82	0.99	>0.9	>0.9	0.99	1.04	System Upgrade/ Preferred Resources/Operating Solution as needed
DEL MAR 60 kV	RANCHO SECO-BELLOTA #1 230KV & RANCHO SECO-BELLOTA #2 230KV	P7	DCTL	0.96	>0.9	>0.9	1.05	>0.9	>0.9	0.71	1.06	Sensitivity Only
BRKR SLG 115 kV	RIO OSO 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.98	0.99	0.89	1.02	1.05	0.99	1.01	1.07	Continue to monitor future forecast
WOODLD 115 kV		P5	Non-Redundant Relay	0.95	0.96	0.87	0.99	1.06	0.96	0.99	1.05	
BRKR SLG 115 kV	RIO OSO 115kV - Section 2D & 1D	P2-4	Bus Tie Breaker Falut	0.96	0.99	0.86	1.01	1.06	0.98	1.00	1.07	Continue to monitor future forecast
KNIGHTLD 115 kV		P2-4	Bus Tie Breaker Falut	0.94	0.97	0.83	0.97	1.07	0.96	0.99	1.05	
MOBILCHE 115 kV		P2-4	Bus Tie Breaker Falut	0.94	0.97	0.83	0.97	1.06	0.96	0.99	1.05	
W.SCRMNO 115 kV		P2-4	Bus Tie Breaker Falut	1.00	1.02	0.89	1.02	1.06	1.02	1.03	1.07	
WOODLD 115 kV		P2-4	Bus Tie Breaker Falut	0.94	0.97	0.83	0.97	1.06	0.96	0.99	1.05	
PLUMAS 60 kV	RIO OSO 230.00kV Gen Unit VW & E.MRYSVE-MRYSVLE #1 60kV	P3	N-G-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast



Study Area: PG&E Central Valley

Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
PLSNT GR 115 kV	RIO OSO 230.00kV Gen Unit VW & RIO OSO-LINCLN-SPI-LINC 115kV	P3	N-G-1	>0.9	>0.9	0.90	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
NA	RIO OSO 230kV - Section 2D & 1D	P2-4	Bus Tie Breaker Falut	0.93	0.95	Diverge	1.00	1.08	0.95	0.96	1.04	Continue to monitor future forecast
LINCLN 115 kV	RIO OSO-LINCLN-SPI-LINC 115kV	P1	N-1	0.95	0.98	0.90	1.03	1.06	0.98	0.98	1.04	Continue to monitor future forecast
TAYLOR 60 kV		P1	N-1	0.97	1.00	0.90	1.05	1.09	0.99	1.00	1.06	
BANGOR 60 kV	RIO OSO-WOODLAND #1 115KV & COLGATE2 13.80kV Gen Unit 1	P6	N-1-1	>0.9	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
PIKE CTY 60 kV		P6	N-1-1	>0.9	>0.9	0.90	>0.9	>0.9	>0.9	>0.9	>0.9	
BEALE_1 60 kV	RIO OSO-WOODLAND #1 115KV & COLGATE-SMARTVILLE #1 60kV MOAS OPENED on COLGATE_NRRWS1TP	P6	N-1-1	>0.9	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
BEALE_2 60 kV		P6	N-1-1	>0.9	>0.9	0.86	>0.9	>0.9	>0.9	>0.9	>0.9	
BRWNS VY 60 kV		P6	N-1-1	>0.9	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	
NARRWS 1 60 kV		P6	N-1-1	>0.9	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	
SMRTVLLE 60 kV		P6	N-1-1	>0.9	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
YUBAGOLD 60 kV		P6	N-1-1	>0.9	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	
ELDORAD 115 kV	RIO OSO-WOODLAND #1 115KV & MISSOURI FLAT-GOLD HILL #2 115kV	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
PLCRVLB2 115 kV		P6	N-1-1	>0.9	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
PLCRVLB3 115 kV		P6	N-1-1	>0.9	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
BONNIE N 60 kV	RIO OSO-WOODLAND #1 115KV & ROLLINS 60/6.6kV TB 1	P6	N-1-1	>0.9	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
CAPEHORN 60 kV		P6	N-1-1	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	
SHADYGLN 60 kV		P6	N-1-1	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	
CAPEHORN 60 kV	ROLLINSF 6.60kV Gen Unit 1 & COLGATE-GRASS VALLEY 60kV	P3	N-G-1	>0.9	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
GRSS VLY 60 kV		P3	N-G-1	0.90	>0.9	0.86	>0.9	>0.9	>0.9	>0.9	>0.9	
SHADYGLN 60 kV		P3	N-G-1	>0.9	>0.9	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	
WEMR SWS 60 kV		P3	N-G-1	>0.9	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	
GUSTINE 60 kV	SCHULTE SW STA-KASSON-MANTECA 115kV & LAMMERS-KASSON 115kV	P6	N-1-1	0.90	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	
GUSTINE 60 kV	SCHULTE SW STA-KASSON-MANTECA 115kV & SCHULTE SW STA-LAMMERS 115kV	P6	N-1-1	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	
CRWS LDG 60 kV	SCHULTE SW STA-LAMMERS 115kV & SCHULTE SW STA-KASSON-MANTECA 115kV	P6	N-1-1	0.90	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	- Vierra Looping in Project - Expected ISD: Dec. 2026 - Short term: Action Plan
GUSTINE 60 kV		P6	N-1-1	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	
INGRM C. 115 kV		P6	N-1-1	0.76	0.77	>0.9	>0.9	>0.9	0.77	0.85	>0.9	
MILLER 115 kV		P6	N-1-1	0.86	0.89	>0.9	>0.9	>0.9	0.89	>0.9	>0.9	
VALLY HM 115 kV		P6	N-1-1	0.56	0.59	0.87	>0.9	>0.9	0.59	0.70	>0.9	
CURTISS 115 kV	STANISLS 13.80kV Gen Unit 1 & BELLOTA-RIVERBANK-MELONES SW STA 115kV	P3	N-G-1	>0.9	>0.9	0.85	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
MI-WUK 115 kV		P3	N-G-1	>0.9	>0.9	0.85	>0.9	>0.9	>0.9	>0.9	>0.9	
SPRNG GP 115 kV		P3	N-G-1	>0.9	>0.9	0.86	>0.9	>0.9	>0.9	>0.9	>0.9	

Study Area: PG&E Central Valley

Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
VALLY HM 115 kV	STANISLS 13.80kV Gen Unit 1 & MANTECA-RIPON 115kV	P3	N-G-1	0.84	0.80	0.76	>0.9	>0.9	0.79	>0.9	>0.9	Operating Procedure
PLAINFLD 60 kV	VACA-DIX 115/60KV TB 9	P1	N-1	0.81	0.99	0.88	1.05	1.08	0.98	0.94	1.06	- Vaca Davis Area Reinforcement Project - Expected ISD: Dec. 2025 - Short term: Action Plan - Continue to monitor the long term issue
FORST HL 60 kV	WEIMAR #1 60kV (ENVRO_HY-FORST HL)	P2-1	Line Section w/o Fault	0.93	0.95	0.90	0.93	1.02	0.94	0.97	0.99	Continue to monitor future forecast
BRKR SLG 115 kV	WEST SACRAMENTO-DAVIS 115KV & WOODLAND-DAVIS 115KV	P6	N-1-1	>0.9	>0.9	0.80	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor future forecast
NA	TESLA 115kV - Section 2D & 1D	P2-4	Bus Tie Breaker Falut	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	System Upgrade/ Preferred Resources/Operating Solution as needed
DEL MAR 60 kV	ATLANTIC-GOLD HILL 230kV & RIO OSO-ATLANTIC 230kV	P6	N-1-1	0.85	>0.9	0.78	>0.9	>0.9	>0.9	>0.9	>0.9	Operating Procedure
PLSNT GR 115 kV				0.88	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	
ROCKLIN 60 kV				0.86	>0.9	0.81	>0.9	>0.9	>0.9	>0.9	>0.9	
SIERRAPI 60 kV				0.85	>0.9	0.78	>0.9	>0.9	>0.9	>0.9	>0.9	
TAYLOR 60 kV				0.86	>0.9	0.81	>0.9	>0.9	>0.9	>0.9	>0.9	
RVRBANK 115 kV	BELLOTA 230/115kV TB 1 & BELLOTA 230/115kV TB 2	P6	N-1-1	0.52	0.57	0.48	0.88	>0.9	0.57	0.82	>0.9	Operating Procedure
CH.STN 115 kV				0.68	0.76	0.66	0.00		0.75	0.88		
CURTISS 115 kV				0.69	0.77	0.65	>0.9	>0.9	0.76	0.89	>0.9	
MI-WUK 115 kV				0.71	0.79	0.66	>0.9	>0.9	0.79	>0.9	>0.9	
PEORIA 115 kV				0.68	0.75	0.66	>0.9	>0.9	0.74	0.88	>0.9	
R.TRACK 115 kV				0.68	0.74	0.66	>0.9	>0.9	0.74	0.87	>0.9	
SPRNG GP 115 kV				0.74	0.83	0.70	>0.9	>0.9	0.82	>0.9	>0.9	
CH.STN 115 kV	BELLOTA 230kV - Section 1E & 2E	P2-4	Bus Tie Breaker Falut	0.68	0.76	0.65	0.69	1.07	0.75	0.66	1.03	SPS recommended in 2019-2020 TPP
CURTISS 115 kV				0.68	0.77	0.64	0.67	1.07	0.76	0.65	1.03	
GRAND IS 115 kV				0.98	1.04	0.89	1.07	1.05	1.04	1.03	1.08	
MI-WUK 115 kV				0.70	0.79	0.65	0.67	1.07	0.79	0.65	1.03	
PEORIA 115 kV				0.67	0.75	0.65	0.69	1.07	0.74	0.65	1.03	
R.TRACK 115 kV				0.67	0.74	0.65	0.69	1.08	0.74	0.65	1.03	
RVRBANK 115 kV				0.52	0.57	0.47	0.55	1.12	0.57	0.55	1.02	
SPRNG GP 115 kV				0.73	0.83	0.68	0.67	1.06	0.82	0.65	1.04	
VALLY HM 115 kV				0.75	0.82	0.76	0.86	1.03	0.81	0.77	1.03	
BELL PGE 115 kV		P5	Non-Redundant Relay	0.90	0.91	0.74	0.99	1.08	0.90	0.99	1.04	
HALSEY 60 kV		P5	Non-Redundant Relay	0.95	0.97	0.75	1.02	1.03	0.96	1.02	1.03	
HIGGINS 115 kV		P5	Non-Redundant Relay	0.92	0.93	0.78	1.00	1.07	0.92	1.00	1.04	
MTN_QUAR 60 kV		P5	Non-Redundant Relay	0.95	0.97	0.74	1.02	1.03	0.97	1.02	1.03	
PENRYN 60 kV		P5	Non-Redundant Relay	0.94	0.97	0.72	1.01	1.04	0.96	1.01	1.03	
PLACER 115 kV		P5	Non-Redundant Relay	0.89	0.91	0.73	0.99	1.08	0.90	0.99	1.04	

Study Area: PG&E Central Valley

Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
NA		P5	Non-Redundant Relay	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	Diverge	
BELL PGE 115 kV		P2-4	Bus Tie Breaker Falut	0.83	0.57	0.53	0.96	1.12	0.56	1.00	1.04	
BONNIE N 60 kV		P2-4	Bus Tie Breaker Falut	0.96	0.90	0.87	0.98	1.03	0.89	1.01	1.01	
CAPEHORN 60 kV		P2-4	Bus Tie Breaker Falut	0.95	0.90	0.86	0.95	1.04	0.89	1.00	1.01	
DRUM 60 kV		P2-4	Bus Tie Breaker Falut	0.96	0.90	0.88	0.99	1.02	0.89	1.01	1.01	
FLINT 115 kV		P2-4	Bus Tie Breaker Falut	0.82	0.56	0.52	0.96	1.12	0.55	0.99	1.04	
HALSEY 60 kV		P2-4	Bus Tie Breaker Falut	0.88	0.58	0.52	1.02	1.04	0.57	1.02	1.03	
HIGGINS 115 kV		P2-4	Bus Tie Breaker Falut	0.86	0.61	0.59	0.98	1.11	0.61	1.00	1.04	
HORSESHE 115 kV		P2-4	Bus Tie Breaker Falut	0.82	0.55	0.50	0.95	1.13	0.54	1.00	1.04	
MTN_QUAR 60 kV		P2-4	Bus Tie Breaker Falut	0.87	0.58	0.51	1.02	1.04	0.57	1.02	1.03	
PENRYN 60 kV		P2-4	Bus Tie Breaker Falut	0.87	0.57	0.49	1.01	1.04	0.56	1.02	1.03	
PLACER 115 kV		P2-4	Bus Tie Breaker Falut	0.82	0.56	0.52	0.96	1.12	0.55	0.99	1.04	
SHADYGLN 60 kV		P2-4	Bus Tie Breaker Falut	0.96	0.90	0.86	0.95	1.04	0.89	1.00	1.01	
WEMR SWS 60 kV		P2-4	Bus Tie Breaker Falut	0.96	0.90	0.85	0.94	1.04	0.89	1.01	1.01	

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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
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
CH.STN 115 kV	STANISLS 13.80kV Gen Unit 1 & BELLOTA-RIVERBANK-MELONES SW STA 115kV	P3	N-G-1	<8	<8	10	<8	<8	<8	<8	<8	Continue to monitor future forecast
CURTISS 115 kV		P3	N-G-1	<8	<8	10	<8	<8	<8	<8	<8	Continue to monitor future forecast
PEORIA 115 kV		P3	N-G-1	<8	<8	10	<8	<8	<8	<8	<8	Continue to monitor future forecast
R.TRACK 115 kV		P3	N-G-1	<8	<8	10	<8	<8	<8	<8	<8	Continue to monitor future forecast
SPRNG GP 115 kV		P3	N-G-1	<8	<8	10	<8	<8	<8	<8	<8	Continue to monitor future forecast
MI-WUK 115 kV		P3	N-G-1	<8	<8	10	<8	<8	<8	<8	<8	Continue to monitor future forecast
VALLY HM 115 kV	STANISLS 13.80kV Gen Unit 1 & MANTECA-RIPON 115kV	P3	N-G-1	12	17	18	<8	<8	18	<8	<8	Operating procedure
E.NICOLS 115 kV	RIO OSO-NICOLAUS 115kV	P1	N-1	5	5	10	<8	<8	6	2	<8	Continue to monitor future forecast
LINCLN 115 kV	RIO OSO-LINCLN-SPI-LINC 115kV	P1	N-1	3	4	8	1	<8	4	3	1	Continue to monitor future forecast
GRSS VLY 60 kV	ROLLINSF 6.60kV Gen Unit 1 & COLGATE-GRASS VALLEY 60kV	P3	N-G-1	10	<8	12	<8	<8	<8	<8	<8	Disable automatics
GUSTINE 60 kV	CROW CREEK SW STA-FRONTIER SOLAR PV 60kV	P1	N-1	<8	2	10	<8	<8	2	<8	<8	Continue to monitor future forecast
NEWMAN 60 kV		P1	N-1	<8	1	8	<8	<8	2	<8	<8	Continue to monitor future forecast
MRYSVLE 60 kV	E.MRYSVE-MRYSVLE #1 60kV	P1	N-1	<8	<8	15	<8	<8	<8	<8	<8	Continue to monitor future forecast
MRYSVLE 60 kV	PEASE-MARYSVILLE-HARTER 60kV	P1	N-1	11	10	<8	1	<8	10	6	<8	- East Marysville 115/60 kV Transformer Project - Expected ISD: Dec. 2026 - Short term: Action Plan
WESTLEY 60 kV	KASSON 115/60kV TB 1	P1	N-1	20	16	22	1	<8	17	11	<8	Kasson SPS

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Transient Stability



Contingency	Category	Category Description	Transient Stability Performance						Potential Mitigation Solutions
			Baseline Scenarios				Sensitivity Scenarios		
			2023 Spring Off-Peak	2026 Summer Peak	2031 Summer Peak	2031 Spring Off-Peak	2026 SP High CEC Forecast	2023 OP Heavy Renewable & Min Gas Gen	
In accordance with TPL-001-4- Requirement R2.6, this area relies on the past studies from the 2019-20 Transmission Planning Process for transient stability studies:									
<a href="http://www.aiso.com/Documents/AppendixC-BoardApprovedt2019-2020TransmissionPlan.pdf">http://www.aiso.com/Documents/AppendixC-BoardApprovedt2019-2020TransmissionPlan.pdf</a>									



Study Area: PG&E Central Valley



Single Contingency Load Drop

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)									Potential Mitigation Solutions
			2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2031 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	

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

Study Area: **PG&E Central Valley**



**Single Source Substation with more than 100 MW Load**

Substation	Load Served (MW)									Potential Mitigation Solutions
	2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2031 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	

No single source substation with more than 100 MW