



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-T-1	Potrero-Mission (AX) 115kV Cable	Potrero-Larkin #2 (AY-2) 115kV Cable	P1	N-1	96.09	99.16	101.58	75.98	61.78	105.24	104.32	105.52	Short Term: Action Plan Long Term: Modifying TBC DC Runback Scheme
GBA-T-2	Newark-Dixon Landing 115kV Line	Piercy-Metcalf 115 kV	P1	N-1	112.83	72.00	60.00	59.75	30.00	41.53	31.00	22.00	Short Term : Action Plan; Long Term : Evergreen-Mabury Voltage Conversion Project
GBA-T-3	Piercy-Metcalf 115 kV Line	Newark-Dixon Landing 115kV Line	P1	N-1	104.41	64.53	66.27	54.07	20.82	55.98	38.09	37.54	Short Term : Action Plan; Long Term : Evergreen-Mabury Voltage Conversion Project
GBA-T-4	Moraga-Oakland J 115kV Line	SN LNDRO-DMTARSL #1 115 kV	P2-1	Line section w/o fault	125.17	58.33	55.88	82.40	27.20	126.42	49.77	50.55	Short Term: Action plan - Open Grant-J line at Oakland J following RCEC outage Long Term: Reconductor Moraga-Oakland J 115 kV Line
GBA-T-5	Oleum-Christie 115kV Line	BUS-TIE BREAKER FAULT AT 33010 SOBRANTE 115.00	P2	Bus-tie breaker	101.14	56.99	58.18	80.79	51.27	66.21	36.73	36.37	Short Term : Action Plan ; Long Term : North Tower 115 kV Looping Project
GBA-T-6	Sobrante-El Cerrito STA G #2 115kV Line	BUS 1 FAULT AT 33010 SOBRANTE 115.00	P2	Bus	103.59	94.70	93.60	64.83	50.32	71.21	62.84	62.55	Short Term : Action Plan; Long Term : North Tower 115 kV Looping Project
GBA-T-7	Oakland D - Oakland L 115kV Cable	BUS-TIE BREAKER FAULT AT 32790 STATIN X 115.00	P2	Bus-tie breaker	59.42	92.81	128.82	88.04	66.64	136.52	133.46	68.29	Increase generation in the Oakland Area
GBA-T-8	Oakland C - Oakland X #2 115kV Cable	BUS-TIE BREAKER 162 FAULT AT 32780 CLARMNT 115.00	P2	Bus-tie breaker	27.94	89.63	111.58	75.92	61.54	118.51	116.16	35.70	Increase generation in the Oakland Area
GBA-T-9	Martinez-Oleum 115kV Line	BUS-TIE BREAKER FAULT AT 33010 SOBRANTE 115.00	P2	Bus-tie breaker	256.30	218.08	219.47	174.53	142.53	171.27	143.11	140.14	SPS or system upgrade
GBA-T-10	Oleum-Martinez 115kV Line	BUS-TIE BREAKER FAULT AT 33010 SOBRANTE 115.00	P2	Bus-tie breaker	237.63	202.19	203.48	161.81	132.13	190.24	158.97	155.67	SPS or system upgrade
GBA-T-11	Moraga-Claremont #1 115kV Line	BUS-TIE BREAKER FAULT AT 32790 STATIN X 115.00	P2	Bus-tie breaker	67.43	107.62	129.40	68.62	58.05	89.19	96.88	59.23	Increase generation in the Oakland Area
GBA-T-12	Moraga-Claremont #2 115kV Line	BUS-TIE BREAKER FAULT AT 32790 STATIN X 115.00	P2	Bus-tie breaker	67.53	107.78	129.59	68.72	58.13	89.32	97.02	59.32	Increase generation in the Oakland Area
GBA-T-13	Moraga-Oakland J 115kV Line	BUS D FAULT AT 35101 SN LNDRO 115.00	P2	Bus	124.96	61.82	59.04	82.37	29.00	126.24	51.84	52.44	Short Term: Action plan - Open Grant-J line at Oakland J following RCEC outage Long Term: Reconductor Moraga-Oakland J 115 kV Line

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					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-T-14	Sobrante-Moraga 115kV Line	BUS-TIE BREAKER FAULT AT 30550 MORAGA 230.00	P2	Bus-tie breaker	101.27	85.14	88.25	83.39	50.32	114.63	69.42	48.34	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-15	Moraga-Station X 115 kV #1 Line	BUS-TIE BREAKER 162 FAULT AT 32780 CLARMNT 115.00	P2	Bus-tie breaker	39.42	91.49	109.91	75.15	60.14	117.98	115.20	45.70	Increase generation in the Oakland Area
GBA-T-16	Moraga-Oakland X #2 115kV Line	BUS-TIE BREAKER 162 FAULT AT 32780 CLARMNT 115.00	P2	Bus-tie breaker	39.42	91.49	109.91	75.15	60.14	117.98	115.20	45.70	Increase generation in the Oakland Area
GBA-T-17	Moraga-Station X 115 kV #3 Line	BUS-TIE BREAKER FAULT AT 33020 MORAGA 115.00	P2	Bus-tie breaker	39.42	133.96	157.68	75.15	60.14	117.98	145.57	55.02	Increase generation in the Oakland Area
GBA-T-18	Moraga-Station X 115 kV #4 Line	BUS-TIE BREAKER FAULT AT 33020 MORAGA 115.00	P2	Bus-tie breaker	39.42	133.96	157.68	75.15	60.14	117.98	145.57	55.02	Increase generation in the Oakland Area
GBA-T-19	Moraga-San Leandro #1 115kV Line	BUS 2E FAULT AT 33020 MORAGA 115.00	P2	Bus	120.59	72.23	69.73	74.18	36.24	103.68	54.62	54.04	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-20	Moraga-San Leandro #2 115kV Line	BUS 1E FAULT AT 33020 MORAGA 115.00	P2	Bus	142.63	89.19	85.89	86.78	46.22	118.81	66.32	66.68	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-21	Piercy-Metcalf 115 kV Line	BUS-TIE BREAKER 730 AT 35120 NEWARK D 115.00	P2	Bus-tie breaker	104.72	76.12	78.13	54.16	21.85	66.70	39.95	38.39	Action Plan before Evergreen-Mabury Voltage Conversion
GBA-T-22	Pittsburg 230/115kV Transformer #13	BUS 2D FAULT AT 30526 PITSBG D 230.00	P2	Bus	112.69	67.43	68.04	68.80	72.45	50.66	53.60	50.78	Short Term: Action plan Long Term: Pittsburg 230/115 kV Transformer Addition project
GBA-T-23	Martinez-Sobrante 115kV Line	BUS-TIE BREAKER FAULT AT 30526 PITSBG D 230.00	P2	Bus-tie breaker	127.42	31.15	33.24	74.47	70.91	29.44	38.02	39.22	Increase generation in Pittsburg 115 kV
GBA-T-24	Moraga-San Leandro #3 115kV Line	BUS 2E FAULT AT 33020 MORAGA 115.00	P2	Bus	103.72	62.11	59.96	63.81	31.05	89.93	47.36	46.86	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-25	Loyola-Monta Vista 60 kV Line	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	112.49	79.46	75.40	49.43	17.56	58.81	32.50	30.17	Short Term : Action Plan; Long Term : Monta Vista 230 kV Bus Upgrade Project
GBA-T-26	Potrero-Larkin #2 (AY-2) 115kV Cable	BUS-TIE BREAKER 102 FAULT AT 33204 POTRERO 115.00	P2	Bus-tie breaker	116.12	118.23	120.05	94.33	74.87	124.02	123.08	124.59	Short Term: Action Plan Long Term: Modifying TBC DC Runback Scheme
GBA-T-27	Potrero-Mission (AX) 115kV Cable	NON-BUS-TIE BREAKER CBXX5 FAILURE AT POTRERO 115 kV	P2	Bus-tie breaker	99.19	100.56	102.02	79.47	64.59	106.37	105.56	106.53	Short Term: Action Plan Long Term: Modifying TBC DC Runback Scheme
GBA-T-28	San Mateo-Belmont 115kV Line	BUS FAULT AT 33321 RVNSWD D 115.00	P2	Bus	105.91	99.17	98.46	66.02	66.97	84.25	82.65	79.82	Short Term: Action Plan Long Term: South of San Mateo Capacity Increase Project
GBA-T-29	Ravenswood-San Mateo #1 115kV Line	BUS-TIE BREAKER 112 FAULT AT 30700 SANMATEO 230.00	P2	Bus-tie breaker	89.43	48.29	47.06	61.74	14.91	100.01	51.59	48.65	Short Term: Action Plan Long Term: South of San Mateo Capacity Increase Project

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GBA-T-30	Cooley Landing-Palo Alto 115kV Line	BUS FAULT AT 33315 RVNSWD E 115.00	P2	Bus	112.30	112.89	114.62	47.34	26.66	69.68	70.04	70.74	Palo Alto interim SPS
GBA-T-31	Ravenswood-Cooley Landing #1 115kV Line	BUS FAULT AT 33315 RVNSWD E 115.00	P2	Bus	162.96	124.90	125.77	79.66	37.37	117.40	96.68	94.06	Palo Alto interim SPS
GBA-T-32	San Mateo-Bair 60kV Line	BUS-TIE BREAKER FAULT AT 33316 CLY LND2 115.00	P2	Bus-tie breaker	134.27	130.99	57.61	80.27	62.65	104.56	100.07	41.27	Short Term: Action Plan Long Term: San Mateo-Bair 60 kV Line Reconductor Project
GBA-T-33	Bair 115/60kV Transformer #1	BUS-TIE BREAKER FAULT AT 33316 CLY LND2 115.00	P2	Bus-tie breaker	157.72	157.45	157.07	103.08	62.52	143.77	138.16	129.27	Review Stanford 60 kV system configuration
GBA-T-34	Bair-Cooley Landing #1 60kV Line	BUS-TIE BREAKER FAULT AT 33316 CLY LND2 115.00	P2	Bus-tie breaker	130.04	129.38	126.54	79.32	44.75	105.23	100.64	92.07	Review Stanford 60 kV system configuration
GBA-T-35	Bair-Cooley Landing #2 60kV Line	BUS-TIE BREAKER FAULT AT 33316 CLY LND2 115.00	P2	Bus-tie breaker	126.65	125.78	122.58	78.14	50.69	83.85	80.42	73.27	Review Stanford 60 kV system configuration
GBA-T-36	Eastshore 230/115kV Transformer #2	NON-BUS-TIE BREAKER CB2222 FAILURE AT EAST SHORE 230 kV	P2	Bus-tie breaker	103.33	104.22	103.80	20.34	88.77	43.93	93.89	95.48	Action Plan - reduce RCEC generation
GBA-T-37	Newark-Lawrence 115kV Line	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	323.12	324.89	320.60	148.46	113.31	137.56	137.46	133.26	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completed
GBA-T-38	Newark-Applied Materials 115kV Line	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	255.06	215.60	210.73	116.65	74.92	119.42	112.54	107.73	Short Term : Action Plan; Long Term : Monta Vista 230 kV Bus Upgrade Project
GBA-T-39	Newark-Dixon Landing 115kV Line	BUS FAULT AT 35643 MTCALF E 115.00	P2	Bus	113.51	107.63	107.67	60.07	40.32	66.68	65.99	64.42	SPS or rerate
GBA-T-40	Lawrence - Monta Vista 115 kV	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	224.99	220.44	212.89	100.23	64.58	93.93	90.98	85.80	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completed
GBA-T-41	Britton-Monta Vista 115 kV Line	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	140.68	139.08	135.35	62.72	39.71	70.59	69.26	66.08	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completed
GBA-T-42	Applied Materials-Britton 115 kV Line	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	193.87	191.95	187.01	91.07	59.62	101.94	99.99	95.34	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completed
GBA-T-43	Metcalf 230/115 kV Trans No. 1	BUS-TIE BREAKER 322 FAULT AT 30735 METCALF 230.00	P2	Bus-tie breaker	98.52	108.75	93.65	65.97	43.72	97.66	72.55	60.83	Short Term: Action Plan Long Term: Morgan Hill Area Reinforcement Project
GBA-T-44	Metcalf-Llagas 115 kV Line	BUS FAULT AT 35648 LLAGAS F 115.00	P2	Bus	90.72	85.72	126.42	18.26	10.63	5.38	6.64	5.78	Reduce Gilroy generation
GBA-T-45	Metcalf 230/115 kV Trans No. 3	BUS-TIE BREAKER 322 FAULT AT 30735 METCALF 230.00	P2	Bus-tie breaker	97.92	108.13	93.78	65.13	43.15	96.78	71.68	60.46	Short Term: Action Plan Long Term: Morgan Hill Area Reinforcement Project
GBA-T-46	Potrero-Mission (AX) 115kV Cable	DEC CTG1 18.00 Generator ID 1 & Potrero-Larkin #2 (AY-2) 115kV Cable	P3	G-1/N-1	<90	102.33	104.31	<90	<90	107.43	107.63	108.56	Short Term: Action Plan Long Term: Modifying TBC DC Runback Scheme

Study Area: PG&E Greater Bay Area

Thermal Overloads



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-T-47	Christie-Sobrante (Oleum-Sobrante) 115kV Line	Sobrante-El Cerrito STA G #1 115kV Line & Sobrante-El Cerrito STA G #2 115kV Line	P6	N-1/N-1	128.31	117.17	116.29	<90	<90	94.10	<90	<90	Action plan or explore potential mitigation
GBA-T-48	San Leandro - Oakland J #1 115kV Line	Moraga-Oakland J 115kV Line & Oakland C - Alameda 115kV Cable	P6	N-1/N-1	104.18	<90	<90	<90	<90	100.84	<90	<90	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-49	Pittsburg 230/115kV Transformer #13	LMEC GSU CC1 & Pittsburg 230/115kV Transformer #12	P6	N-1/N-1	137.87	139.52	<90	<90	<90	99.67	99.51	<90	Short Term: Action plan Long Term: Pittsburg 230/115 kV Transformer Addition project
GBA-T-50	Martinez-Oleum 115kV Line	Sobrante-El Cerrito STA G #2 115kV Line & Sobrante-El Cerrito STA G #1 115kV Line	P6	N-1/N-1	108.09	<90	92.35	<90	<90	<90	<90	<90	Short Term: Action Plan; Long Term :North Tower 115 kV Looping Project
GBA-T-51	Moraga-Claremont #1 115kV Line	Oakland C - Oakland X #2 115kV Cable & Oakland C - Oakland X #3 115kV Cable	P6	N-1/N-1	<90	99.36	107.06	<90	<90	<90	<90	<90	Increase generation in the Oakland Area
GBA-T-52	Moraga-Claremont #1 115kV Line	Moraga-Claremont #2 115kV Line & Oakland C - Oakland L #1 115kV Cable	P6	N-1/N-1	<90	102.82	107.84	<90	<90	<90	<90	<90	Increase generation in the Oakland Area
GBA-T-53	Moraga-Claremont #2 115kV Line	Oakland C - Oakland X #2 115kV Cable & Oakland C - Oakland X #3 115kV Cable	P6	N-1/N-1	<90	99.50	107.21	<90	<90	<90	<90	<90	Increase generation in the Oakland Area
GBA-T-54	Moraga-Claremont #2 115kV Line	Moraga-Claremont #1 115kV Line & Oakland C - Oakland L #1 115kV Cable	P6	N-1/N-1	<90	103.00	107.90	<90	<90	<90	<90	<90	Increase generation in the Oakland Area
GBA-T-55	Moraga-San Leandro #1 115kV Line	Moraga-San Leandro #3 115kV Line & Moraga-San Leandro #2 115kV Line	P6	N-1/N-1	142.05	93.03	<90	<90	<90	118.55	<90	<90	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-56	Moraga-San Leandro #2 115kV Line	Moraga-San Leandro #3 115kV Line & Moraga-San Leandro #1 115kV Line	P6	N-1/N-1	142.49	93.47	90.32	<90	<90	118.93	<90	<90	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-57	Potrero-Mission (AX) 115kV Cable	Potrero-Larkin #1 (AY-1) 115kV Cable & Potrero-Larkin #2 (AY-2) 115kV Cable	P6	N-1/N-1	118.86	122.59	125.15	93.40	<90	130.28	129.37	130.64	Short Term: Action Plan Long Term: Modifying TBC DC Runback Scheme
GBA-T-58	Martin-Larkin (HY-1) 115kV Cable	Potrero-Larkin #1 (AY-1) 115kV Cable & Mission-Larkin (XY-1) 115kV Cable	P6	N-1/N-1	149.34	149.97	150.49	94.67	<90	177.18	177.40	177.83	Short Term: Action Plan Long Term: Modifying TBC DC Runback Scheme
GBA-T-59	San Mateo-Belmont 115kV Line	Ravenswood 230/115kV Transformer #1 & Ravenswood 230/115kV Transformer #2	P6	N-1/N-1	118.48	109.29	108.73	<90	<90	<90	<90	<90	Action plan or explore potential mitigation
GBA-T-60	Ravenswood-Coolley Landing #1 115kV Line	Ravenswood-Palo Alto #2 115kV Line & Ravenswood-Palo Alto #1 115kV Line	P6	N-1/N-1	138.09	98.00	98.35	<90	<90	92.64	<90	<90	Palo Alto interim SPS
GBA-T-61	Millbrae-Sneath Lane 60kV Line	Martin-Sneath Lane 60kV Line & Hillsdale JCT - Half Moon Bay 60kV Line	P6	N-1/N-1	104.80	109.52	114.42	<90	<90	124.56	128.99	133.67	Action plan or explore potential mitigation
GBA-T-62	San Mateo-Hillsdale JCT 60kV Line	Jefferson 230/60kV Transformer #1 & Jefferson 230/60kV Transformer #2	P6	N-1/N-1	202.79	201.54	197.40	122.52	101.75	203.83	196.42	183.56	Review Stanford 60 kV system configuration

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GBA-T-63	San Mateo-Bair 60kV Line	Ravenswood-Cooley Landing #2 115kV Line & Cooley Landing 115/60kV Transformer #1	P6	N-1/N-1	134.34	130.15	<90	<90	<90	104.61	100.12	<90	San Mateo-Bair 60 kV Line Reconductor Project
GBA-T-64	San Mateo-Hillsdale JCT 60kV Line (Beresford-Hillsdale)	Jefferson 230/60kV Transformer #1 & Jefferson 230/60kV Transformer #2	P6	N-1/N-1	231.74	230.56	226.30	139.74	97.77	198.41	191.55	179.62	Review Stanford 60 kV system configuration
GBA-T-65	San Mateo-Hillsdale JCT 60kV Line (Hillsdale-Hillsdale JCT)	Jefferson 230/60kV Transformer #1 & Jefferson 230/60kV Transformer #2	P6	N-1/N-1	222.01	221.19	217.41	133.76	93.42	227.11	219.63	206.48	Review Stanford 60 kV system configuration
GBA-T-66	Jefferson-Hillsdale JCT 60kV Line	Jefferson 230/60kV Transformer #1 & Jefferson 230/60kV Transformer #2	P6	N-1/N-1	172.67	171.11	167.53	110.81	<90	167.38	160.14	149.24	Review Stanford 60 kV system configuration
GBA-T-67	Bair-Cooley Landing #1 60kV Line	Ravenswood-Cooley Landing #2 115kV Line & Cooley Landing 115/60kV Transformer #1	P6	N-1/N-1	130.11	129.45	126.59	<90	<90	105.28	100.69	92.12	Review Stanford 60 kV system configuration
GBA-T-68	Grant-Eastshore #1 115kV Line	Grant-Eastshore #2 115kV Line & San Leandro Oakland J #1 115kV Line	P6	N-1/N-1	103.01	<90	<90	<90	<90	<90	<90	<90	Short Term : Action Plan Long Term :East shore-Oakland J project
GBA-T-69	Grant-Eastshore #2 115kV Line	Grant-Eastshore #1 115kV Line & San Leandro Oakland J #1 115kV Line	P6	N-1/N-1	103.01	<90	<90	<90	<90	<90	<90	<90	Short Term : Action Plan Long Term :East shore-Oakland J project
GBA-T-70	Newark-Dixon Landing 115kV Line	Piercy-Metcalf 115 kV & Evergreen-Mabury 115 kV	P6	N-1/N-1	NA	122.06	123.66	<90	<90	<90	<90	<90	Action plan or rerate
GBA-T-71	Newark-Milpitas #1 115kV Line	Newark-Milpitas #2 115kV Line & Swift-Metcalf 115 kV	P6	N-1/N-1	131.63	133.30	134.63	<90	<90	<90	<90	<90	Action plan or explore potential mitigation
GBA-T-72	Metcalf-Llagas 115 kV Line	Metcalf-Morgan Hill 115 kV & Llagas-Gilroy Foods 115 kV	P6	N-1/N-1	115.75	131.14	98.77	<90	<90	<90	<90	<90	Short Term: Action Plan Long Term: Morgan Hill Area Reinforcement Project
GBA-T-73	Oleum-Christie 115kV Line	Sobrante-G Nos. 1 & 2 115 kV lines	P7	DCTL	96.40	103.32	100.40	79.53	39.92	65.30	64.55	64.22	SPS or system upgrade
GBA-T-74	Christie-Sobrante (Oleum-Sobrante) 115kV Line	Sobrante-G Nos. 1 & 2 115 kV lines	P7	DCTL	132.15	118.20	116.72	82.84	64.10	94.10	80.28	79.33	SPS or system upgrade
GBA-T-75	Martinez-Oleum 115kV Line	Sobrante-G Nos. 1 & 2 115 kV lines	P7	DCTL	104.78	87.80	91.68	87.61	73.39	83.97	71.87	70.79	Short Term: Action Plan; Long Term :North Tower 115 kV Looping Project
GBA-T-76	Moraga-San Leandro #1 115kV Line	Moraga-Oakland J 115 kV and Moraga-San Leandro No. 3 115 kV lines	P7	DCTL	126.40	74.64	72.04	77.59	37.42	108.65	56.40	55.85	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-77	Moraga-San Leandro #2 115kV Line	Moraga-Oakland J 115 kV and Moraga-San Leandro No. 3 115 kV lines	P7	DCTL	127.68	75.39	72.76	78.37	37.79	109.74	56.97	56.41	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-78	Moraga-San Leandro #3 115kV Line	Moraga-San Leandro Nos. 1 & 2 115 kV lines	P7	DCTL	114.12	75.87	73.37	69.53	38.26	96.09	56.86	56.08	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-T-79	Cooley Landing-Palo Alto 115kV Line	Ravenswood-Palo Alto Nos. 1 & 2 115 kV lines	P7	DCTL	110.26	110.93	112.49	46.83	26.58	68.65	68.78	69.53	Palo Alto interim SPS



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					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-T-80	Ravenswood-Cooley Landing #1 115kV Line	Ravenswood-Palo Alto Nos. 1 & 2 115 kV lines	P7	DCTL	138.09	98.00	98.35	64.98	38.70	92.64	75.66	73.85	Palo Alto interim SPS
GBA-T-81	San Mateo 115/60kV Transformer #8	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	109.73	105.69	103.90	66.44	55.82	109.74	106.32	100.47	Review Stanford 60 kV system configuration
GBA-T-82	San Mateo-Hillsdale JCT 60kV Line	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	208.44	206.07	202.39	122.70	103.21	209.58	201.34	187.30	Review Stanford 60 kV system configuration
GBA-T-83	San Mateo-Hillsdale JCT 60kV Line (Beresford-Hillsdale)	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	238.44	235.94	232.22	139.98	99.26	204.16	196.48	183.35	Review Stanford 60 kV system configuration
GBA-T-84	San Mateo-Hillsdale JCT 60kV Line (Hillsdale-Hillsdale JCT)	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	228.67	226.55	223.31	134.03	94.92	233.87	225.44	210.87	Review Stanford 60 kV system configuration
GBA-T-85	Jefferson-Hillsdale JCT 60kV Line	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	178.27	175.70	172.41	111.69	83.53	173.08	165.04	153.08	Review Stanford 60 kV system configuration
GBA-T-86	Jefferson-Stanford #1 60kV Line	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	108.10	107.79	107.95	74.78	73.00	116.53	113.92	110.01	Review Stanford 60 kV system configuration
GBA-T-87	Newark-Lawrence 115kV Line	Newark-Applied Materials & Lawrence-Monta Vista 115 kV Lines	P7	DCTL	104.00	109.95	114.11	56.32	63.15	50.84	53.55	54.99	SPS or system upgrade
GBA-T-88	Newark-Dixon Landing 115kV Line	Swift - Metcalf & Piercy - Metcalf 115 kV Lines	P7	DCTL	113.23	63.83	64.73	59.96	28.04	37.07	44.98	45.19	Short Term : Action Plan; Long Term : Evergreen-Mabury Voltage Conversion Project
GBA-T-89	Trimble-San Jose 'B' 115 kV Line	Metcalf - El Patio No. 1 & 2 115 kV Lines	P7	DCTL	100.08	97.18	94.90	40.02	23.80	38.54	70.01	68.78	SPS or system upgrade
GBA-T-90	Piercy-Metcalf 115 kV Line	Newark - Dixon Landing & Newark - Milpitas #1 115 kV Lines	P7	DCTL	104.50	64.45	66.19	54.08	20.77	55.91	37.99	37.43	Short Term : Action Plan; Long Term : Evergreen-Mabury Voltage Conversion Project

Study Area: **PG&E Greater Bay Area**

Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-VD-1	DIXON LD 115 kV	Newark-Dixon Landing 115kV Line	P1	N-1	6.22	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	Evergreen-Mabury Voltage Conversion
GBA-VD-2	EDES 115 kV	Oakland J - Grant 115kV Line	P1	N-1	<5.0	5.04	5.18	<5.0	<5.0	<5.0	<5.0	<5.0	Flip flop scheme. Not instanteneous
GBA-VD-3	HLF MNBY 60 kV	Hillsdale JCT - Half Moon Bay 60kV Line	P1	N-1	<5.0	<5.0	<5.0	<5.0	<5.0	6.18	7.12	7.37	Flip flop scheme. Not instanteneous
GBA-VD-4	ALHAMBRA 115 kV	MARTNZ D-ALHAMTP1 #1 115 kV	P2-1	Line section w/o fault	<5.0	<5.0	5.09	<5.0	<5.0	<5.0	<5.0	<5.0	Mitigation under investigation
GBA-VD-5	DMTAR_SL 115 kV	SN LNDRO-DMTARSL #1 115 kV	P2-1	Line section w/o fault	<5.0	<5.0	<5.0	<5.0	<5.0	6.15	<5.0	<5.0	Mitigation under investigation
GBA-VD-6	EDES 115 kV	EDS GRNT-GRANT #1 115 kV	P2-1	Line section w/o fault	<5.0	5.44	5.55	<5.0	<5.0	<5.0	5.32	5.21	Mitigation under investigation
GBA-VD-7	LOCKHD 1 115 kV	NEWARK F-LCKHD J1 #1 115 kV	P2-1	Line section w/o fault	<5.0	5.24	5.61	<5.0	<5.0	<5.0	<5.0	<5.0	Mitigation under investigation
GBA-VD-8	MOFT.FLD 115 kV	NEWARK F-LCKHD J1 #1 115 kV	P2-1	Line section w/o fault	<5.0	5.23	5.60	<5.0	<5.0	<5.0	<5.0	<5.0	Mitigation under investigation
GBA-VD-9	DIXON LD 115 kV	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	6.51	5.25	4.83	1.62	0.82	1.83	1.59	1.60	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completetd
GBA-VD-10	LOCKHD 1 115 kV	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	17.22	17.17	16.38	5.17	3.10	6.03	6.28	5.51	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completetd
GBA-VD-11	MOFT.FLD 115 kV	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	17.18	17.13	16.35	5.17	3.09	6.02	6.27	5.51	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completetd

Study Area: **PG&E Greater Bay Area**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-V-1	A.M.D 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-2	Agnew 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.08	1.02	1.03	1.02	Mitigation under investigation
GBA-V-3	Agnew 115kV	Basecase	P0	N-0	1.03	1.03	1.03	1.02	1.06	1.03	1.04	1.04	Mitigation under investigation
GBA-V-4	ALMADEN 60kV	Basecase	P0	N-0	1.03	1.03	1.03	1.05	1.08	1.03	1.04	1.03	Mitigation under investigation
GBA-V-5	ALTAMONT 60kV	Basecase	P0	N-0	1.04	1.05	1.04	1.08	1.10	1.05	1.07	1.05	Mitigation under investigation
GBA-V-6	AMES DST 115kV	Basecase	P0	N-0	1.03	1.03	1.02	1.04	1.08	1.03	1.04	1.03	Mitigation under investigation
GBA-V-7	ANTIOCH 60kV	Basecase	P0	N-0	1.07	1.07	1.07	1.08	1.11	1.08	1.08	1.07	Mitigation under investigation
GBA-V-8	APP MAT 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-9	BAIR 60kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-10	BAIR 115kV	Basecase	P0	N-0	1.03	1.03	1.02	1.03	1.07	1.03	1.03	1.02	Mitigation under investigation
GBA-V-11	BALFOUR 60kV	Basecase	P0	N-0	1.06	1.06	1.06	1.07	1.11	1.07	1.07	1.07	Mitigation under investigation
GBA-V-12	BAY MDWS 115kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-13	BAYSHOR1 115kV	Basecase	P0	N-0	1.05	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-14	BELMONT 115kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-15	BERESFRD 60kV	Basecase	P0	N-0	1.03	1.03	1.02	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-16	BIXLER 60kV	Basecase	P0	N-0	1.02	1.02	1.02	1.06	1.10	1.04	1.06	1.04	Mitigation under investigation
GBA-V-17	BRIONES 60kV	Basecase	P0	N-0	1.05	1.06	1.05	1.07	1.11	1.07	1.07	1.06	Mitigation under investigation
GBA-V-18	BRITTN 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-19	Brokaw 60kV	Basecase	P0	N-0	1.00	1.00	1.00	1.02	1.07	1.01	1.02	1.02	Mitigation under investigation
GBA-V-20	BURLNGME 115kV	Basecase	P0	N-0	1.04	1.03	1.02	1.03	1.08	1.03	1.03	1.02	Mitigation under investigation
GBA-V-21	CAL MEC 230kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.05	1.02	1.02	1.01	Mitigation under investigation
GBA-V-22	CALEVRAS 115kV	Basecase	P0	N-0	1.03	1.03	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-23	CALMAT60 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.01	1.02	1.02	Mitigation under investigation
GBA-V-24	CAROLD1 60kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-25	CAROLD2 60kV	Basecase	P0	N-0	1.02	1.01	1.01	1.04	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-26	CAROLNDS 60kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-27	CC SUB 60kV	Basecase	P0	N-0	1.07	1.07	1.07	1.08	1.11	1.08	1.08	1.07	Mitigation under investigation
GBA-V-28	CC SUB 115kV	Basecase	P0	N-0	1.05	1.05	1.05	1.05	1.08	1.05	1.05	1.05	Mitigation under investigation
GBA-V-29	CCA 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.02	1.07	1.01	1.02	1.02	Mitigation under investigation
GBA-V-30	Central 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-31	CHRISTIE 60kV	Basecase	P0	N-0	1.03	1.03	1.03	1.05	1.07	1.03	1.04	1.04	Mitigation under investigation
GBA-V-32	CLAYTN 115kV	Basecase	P0	N-0	1.02	1.01	1.02	1.03	1.05	1.02	1.03	1.03	Mitigation under investigation
GBA-V-33	CLMBA_ST 115kV	Basecase	P0	N-0	1.03	1.02	1.03	1.04	1.05	1.03	1.04	1.04	Mitigation under investigation
GBA-V-34	CLY LND 115kV	Basecase	P0	N-0	1.04	1.04	1.03	1.04	1.09	1.04	1.04	1.04	Mitigation under investigation
GBA-V-35	CP LECEF 115kV	Basecase	P0	N-0	1.03	1.03	1.03	1.03	1.06	1.03	1.04	1.04	Mitigation under investigation
GBA-V-36	CROWN Z 115kV	Basecase	P0	N-0	1.05	1.05	1.05	1.05	1.08	1.05	1.05	1.05	Mitigation under investigation
GBA-V-37	CRYOGEN 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-38	CRYSTLSG 60kV	Basecase	P0	N-0	1.02	1.01	1.01	1.04	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-39	CYTE PMP 115kV	Basecase	P0	N-0	1.04	1.04	1.03	1.06	1.09	1.05	1.05	1.05	Mitigation under investigation
GBA-V-40	DALY CTY 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-41	DIXON LD 115kV	Basecase	P0	N-0	1.01	1.02	1.01	1.04	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-42	DLY CTYP 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-43	DOMTAR 115kV	Basecase	P0	N-0	1.05	1.05	1.05	1.05	1.08	1.05	1.05	1.05	Mitigation under investigation
GBA-V-44	DU PONT 60kV	Basecase	P0	N-0	1.07	1.07	1.07	1.08	1.11	1.07	1.08	1.07	Mitigation under investigation
GBA-V-45	Duane 115kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-46	DYERWND 60kV	Basecase	P0	N-0	1.04	1.05	1.05	1.08	1.10	1.05	1.07	1.05	Mitigation under investigation
GBA-V-47	E DUBLIN 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.01	1.02	1.02	Mitigation under investigation
GBA-V-48	EDENVALE 115kV	Basecase	P0	N-0	1.03	1.04	1.03	1.06	1.09	1.05	1.05	1.04	Mitigation under investigation
GBA-V-49	EL PATIO 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.04	1.08	1.02	1.03	1.03	Mitigation under investigation
GBA-V-50	EMBRCDRD 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.08	1.02	1.02	1.02	Mitigation under investigation
GBA-V-51	EMBRCDRE 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.08	1.02	1.02	1.02	Mitigation under investigation

Study Area: **PG&E Greater Bay Area**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-V-52	EMRLD LE 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.04	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-53	EST GRND 115kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.08	1.02	1.02	1.02	Mitigation under investigation
GBA-V-54	EVERGREN 60kV	Basecase	P0	N-0	1.02	1.03	1.02	1.04	1.08	1.03	1.04	1.03	Mitigation under investigation
GBA-V-55	EVGRGN 1 115kV	Basecase	P0	N-0	1.02	1.02	1.01	1.04	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-56	FairView 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.02	1.07	1.01	1.02	1.01	Mitigation under investigation
GBA-V-57	Fibergla 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.07	1.01	1.02	1.02	Mitigation under investigation
GBA-V-58	FMC 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-59	FRANKLIN 60kV	Basecase	P0	N-0	1.03	1.03	1.02	1.05	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-60	FREMNT 115kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-61	FRICKWND 60kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.06	1.03	1.03	1.03	Mitigation under investigation
GBA-V-62	FRKLNALT 60kV	Basecase	P0	N-0	1.03	1.03	1.03	1.05	1.07	1.03	1.04	1.04	Mitigation under investigation
GBA-V-63	Gia12 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-64	Gia32 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.08	1.02	1.03	1.02	Mitigation under investigation
GBA-V-65	GILROY 115kV	Basecase	P0	N-0	0.00	1.03	1.03	0.00	1.09	0.00	1.03	1.03	Mitigation under investigation
GBA-V-66	GWF#2 HS 115kV	Basecase	P0	N-0	1.03	1.03	1.03	1.04	1.05	1.03	1.04	1.04	Mitigation under investigation
GBA-V-67	HICKS 230kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.05	1.02	1.02	1.02	Mitigation under investigation
GBA-V-68	HILDAL47 60kV	Basecase	P0	N-0	1.02	1.01	1.01	1.04	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-69	HILDAL49 60kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.03	1.03	1.02	Mitigation under investigation
GBA-V-70	HILLSdle 60kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-71	HLF MNBY 60kV	Basecase	P0	N-0	1.03	1.03	1.03	1.04	1.06	1.03	1.03	1.02	Mitigation under investigation
GBA-V-72	HNTRS PT 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-73	Homstea 60kV	Basecase	P0	N-0	1.00	1.00	1.00	1.02	1.07	1.01	1.02	1.01	Mitigation under investigation
GBA-V-74	HPH1_1 230kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.02	1.01	1.01	Mitigation under investigation
GBA-V-75	HPH2_2 230kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.02	1.01	1.01	Mitigation under investigation
GBA-V-76	IBM-BALY 115kV	Basecase	P0	N-0	1.04	1.04	1.03	1.06	1.09	1.05	1.05	1.05	Mitigation under investigation
GBA-V-77	IBM-HRRS 115kV	Basecase	P0	N-0	1.04	1.04	1.03	1.06	1.09	1.05	1.05	1.04	Mitigation under investigation
GBA-V-78	INTAKE 230kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.02	1.01	1.01	Mitigation under investigation
GBA-V-79	IUKA 60kV	Basecase	P0	N-0	1.01	1.00	1.00	1.03	1.06	1.01	1.02	1.02	Mitigation under investigation
GBA-V-80	JARVIS 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-81	JEFFERSN 230kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-82	JEFRSN_D 60kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-83	JENING J 115kV	Basecase	P0	N-0	0.00	1.01	1.01	0.00	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-84	JENNINGS 115kV	Basecase	P0	N-0	0.00	1.01	1.01	0.00	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-85	JMDAMCX1 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.05	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-86	JMDAMCX2 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.05	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-87	Juliette 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-88	JV BART 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-89	Kenneth 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-90	KIRKER 115kV	Basecase	P0	N-0	1.03	1.02	1.03	1.04	1.05	1.03	1.04	1.04	Mitigation under investigation
GBA-V-91	KPH1_9 230kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.02	1.01	1.01	Mitigation under investigation
GBA-V-92	KPH2_10 230kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.02	1.01	1.01	Mitigation under investigation
GBA-V-93	KPH3_11 230kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.02	1.01	1.01	Mitigation under investigation
GBA-V-94	KRS 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-95	KRS 115kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-96	Laf T1 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-97	Laf T2 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-98	Laf T3 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-99	LARKIN D 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-100	LARKIN E 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-101	LARKIN F 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-102	LAS PLGS 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.04	1.07	1.01	1.02	1.02	Mitigation under investigation

Study Area: **PG&E Greater Bay Area**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-V-103	LAWRENCE 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-104	LIVERMRE 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-105	LIVRMR_2 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-106	LLAGAS 115kV	Basecase	P0	N-0	0.00	1.03	1.02	0.00	1.09	0.00	1.03	1.02	Mitigation under investigation
GBA-V-107	LMEC 115kV	Basecase	P0	N-0	1.03	1.03	1.03	1.04	1.05	1.03	1.04	1.04	Mitigation under investigation
GBA-V-108	LOCKHD 1 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-109	LONESTAR 115kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-110	LOS ALTS 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.05	1.08	1.03	1.04	1.03	Mitigation under investigation
GBA-V-111	LOS GATS 60kV	Basecase	P0	N-0	1.00	1.00	1.00	1.05	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-112	LOYOLA 60kV	Basecase	P0	N-0	1.01	1.02	1.01	1.05	1.08	1.03	1.04	1.04	Mitigation under investigation
GBA-V-113	LPOSTAS 60kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-114	LS ESTRS 115kV	Basecase	P0	N-0	1.03	1.03	1.03	1.03	1.06	1.03	1.04	1.04	Mitigation under investigation
GBA-V-115	LS ESTRS 230kV	Basecase	P0	N-0	1.02	1.02	1.02	1.03	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-116	MABURY 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.04	1.08	1.02	1.03	1.03	Mitigation under investigation
GBA-V-117	MARKHAM 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.04	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-118	MARSH 60kV	Basecase	P0	N-0	1.05	1.06	1.06	1.07	1.11	1.07	1.07	1.06	Mitigation under investigation
GBA-V-119	MARTIN 60kV	Basecase	P0	N-0	1.15	1.05	1.05	1.14	1.19	1.05	1.05	1.05	Mitigation under investigation
GBA-V-120	MARTIN C 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-121	MARTIN C 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.08	1.02	1.02	1.02	Mitigation under investigation
GBA-V-122	Mathew 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.02	1.07	1.01	1.02	1.02	Mitigation under investigation
GBA-V-123	MCKEE 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.04	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-124	METCALF 230kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.05	1.02	1.02	1.02	Mitigation under investigation
GBA-V-125	MILLBRAE 60kV	Basecase	P0	N-0	1.06	1.03	1.03	1.06	1.10	1.03	1.03	1.03	Mitigation under investigation
GBA-V-126	MILLBRAE 115kV	Basecase	P0	N-0	1.04	1.03	1.02	1.04	1.08	1.02	1.02	1.02	Mitigation under investigation
GBA-V-127	MILPITAS 115kV	Basecase	P0	N-0	1.01	1.02	1.01	1.04	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-128	Mission 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-129	MISSON 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-130	MNTA VSA 60kV	Basecase	P0	N-0	1.03	1.03	1.02	1.06	1.08	1.05	1.05	1.04	Mitigation under investigation
GBA-V-131	MNTA VSA 115kV	Basecase	P0	N-0	1.01	1.01	1.00	1.04	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-132	MOCCASIN 115kV	Basecase	P0	N-0	1.04	1.04	1.04	1.05	1.06	1.04	1.05	1.05	Mitigation under investigation
GBA-V-133	MOFT.FLD 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-134	MONTAGUE 115kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.06	1.02	1.03	1.03	Mitigation under investigation
GBA-V-135	MONTAVIS 230kV	Basecase	P0	N-0	1.02	1.02	1.01	1.04	1.06	1.03	1.03	1.03	Mitigation under investigation
GBA-V-136	MRGN HIL 115kV	Basecase	P0	N-0	1.03	1.03	1.01	1.05	1.09	1.04	1.04	1.02	Mitigation under investigation
GBA-V-137	MRT RCTR 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-138	MT VIEW 115kV	Basecase	P0	N-0	1.00	1.00	0.99	1.03	1.05	1.01	1.02	1.01	Mitigation under investigation
GBA-V-139	MTCALF D 115kV	Basecase	P0	N-0	1.04	1.04	1.03	1.06	1.09	1.05	1.05	1.05	Mitigation under investigation
GBA-V-140	MTCALF E 115kV	Basecase	P0	N-0	1.04	1.04	1.03	1.06	1.09	1.05	1.05	1.05	Mitigation under investigation
GBA-V-141	NAJ 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.08	1.02	1.02	1.02	Mitigation under investigation
GBA-V-142	NEWARK 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-143	NEWARK D 115kV	Basecase	P0	N-0	1.03	1.03	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-144	NORTECH 115kV	Basecase	P0	N-0	1.02	1.03	1.02	1.03	1.06	1.02	1.03	1.03	Mitigation under investigation
GBA-V-145	Northwes 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.02	1.07	1.01	1.02	1.01	Mitigation under investigation
GBA-V-146	NRS 230kV	Basecase	P0	N-0	1.01	1.01	1.01	1.02	1.05	1.01	1.02	1.02	Mitigation under investigation
GBA-V-147	NRS 300 115kV	Basecase	P0	N-0	1.02	1.02	1.02	1.03	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-148	NRS 400 115kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-149	NRS 500 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-150	NRS 600 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.08	1.02	1.03	1.02	Mitigation under investigation
GBA-V-151	NRSrser 230kV	Basecase	P0	N-0	1.01	1.01	1.01	1.02	1.05	1.01	1.02	1.02	Mitigation under investigation
GBA-V-152	NUMMI 115kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-153	NWRK 2 M 115kV	Basecase	P0	N-0	1.02	1.02	1.02	1.03	1.06	1.03	1.03	1.03	Mitigation under investigation

Study Area: **PG&E Greater Bay Area**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-V-154	ORACLE60 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-155	OX_MTN60 60kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-156	PACIFICA 60kV	Basecase	P0	N-0	1.08	1.03	1.02	1.08	1.13	1.02	1.02	1.02	Mitigation under investigation
GBA-V-157	Palm 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-158	PARKS 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.01	1.02	1.02	Mitigation under investigation
GBA-V-159	PCBRICK 60kV	Basecase	P0	N-0	1.03	1.03	1.02	1.05	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-160	PERMNNTE 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.06	1.07	1.04	1.05	1.04	Mitigation under investigation
GBA-V-161	PHILLIPS 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-162	PIERCY 115kV	Basecase	P0	N-0	1.02	1.03	1.02	1.05	1.09	1.04	1.04	1.04	Mitigation under investigation
GBA-V-163	PITSBURG 115kV	Basecase	P0	N-0	1.03	1.03	1.03	1.04	1.06	1.03	1.04	1.04	Mitigation under investigation
GBA-V-164	PITTSBRG 60kV	Basecase	P0	N-0	1.06	1.06	1.06	1.07	1.11	1.07	1.07	1.07	Mitigation under investigation
GBA-V-165	POT_SVC 115kV	Basecase	P0	N-0	1.05	1.03	1.04	1.04	1.09	1.03	1.03	1.04	Mitigation under investigation
GBA-V-166	POTRERO 115kV	Basecase	P0	N-0	1.05	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-167	POTRERO 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-168	PRAXAIR 115kV	Basecase	P0	N-0	1.03	1.03	1.03	1.04	1.05	1.03	1.04	1.04	Mitigation under investigation
GBA-V-169	PRT CSTA 60kV	Basecase	P0	N-0	1.03	1.03	1.02	1.05	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-170	Q687 115kV	Basecase	P0	N-0	1.03	1.03	1.03	1.04	1.05	1.03	1.04	1.04	Mitigation under investigation
GBA-V-171	RADUM 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.01	1.02	1.02	Mitigation under investigation
GBA-V-172	RALSTON 60kV	Basecase	P0	N-0	1.02	1.01	1.01	1.04	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-173	RAVENSWD 230kV	Basecase	P0	N-0	1.02	1.02	1.01	1.02	1.05	1.02	1.02	1.01	Mitigation under investigation
GBA-V-174	REDWOOD 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.05	1.02	1.02	1.02	Mitigation under investigation
GBA-V-175	RIVRBANK 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.06	1.02	1.02	1.01	Mitigation under investigation
GBA-V-176	RLSTN35 60kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-177	RLSTN45 60kV	Basecase	P0	N-0	1.02	1.01	1.01	1.04	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-178	RVEC 115kV	Basecase	P0	N-0	1.05	1.05	1.05	1.05	1.08	1.05	1.05	1.05	Mitigation under investigation
GBA-V-179	RVNSWD D 115kV	Basecase	P0	N-0	1.04	1.04	1.03	1.05	1.09	1.04	1.04	1.04	Mitigation under investigation
GBA-V-180	S.L.A.C. 230kV	Basecase	P0	N-0	1.02	1.02	1.01	1.04	1.06	1.02	1.03	1.03	Mitigation under investigation
GBA-V-181	SAN CRLS 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-182	SAN MATO 60kV	Basecase	P0	N-0	1.03	1.03	1.02	1.03	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-183	SAN RAMN 60kV	Basecase	P0	N-0	1.02	1.01	1.00	1.03	1.06	1.01	1.03	1.02	Mitigation under investigation
GBA-V-184	SANMATEO 115kV	Basecase	P0	N-0	1.03	1.03	1.02	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-185	SANMATEO 230kV	Basecase	P0	N-0	1.02	1.02	1.02	1.02	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-186	SANPAULA 115kV	Basecase	P0	N-0	1.04	1.03	1.02	1.04	1.08	1.02	1.02	1.02	Mitigation under investigation
GBA-V-187	SARATOGA 230kV	Basecase	P0	N-0	1.01	1.01	1.01	1.04	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-188	SEAWEST 60kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.06	1.03	1.03	1.03	Mitigation under investigation
GBA-V-189	SEQUOIA 60kV	Basecase	P0	N-0	1.03	1.03	1.02	1.05	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-190	Serra 60kV	Basecase	P0	N-0	1.00	1.00	1.00	1.02	1.07	1.01	1.02	1.01	Mitigation under investigation
GBA-V-191	SERRMNTE 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.04	1.09	1.03	1.03	1.03	Mitigation under investigation
GBA-V-192	SFASWSTA 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.03	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-193	SFIA 115kV	Basecase	P0	N-0	1.04	1.03	1.02	1.03	1.08	1.03	1.03	1.02	Mitigation under investigation
GBA-V-194	SFIA-MA 115kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.08	1.02	1.02	1.02	Mitigation under investigation
GBA-V-195	SFPP CNC 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.04	1.05	1.01	1.02	1.02	Mitigation under investigation
GBA-V-196	SHAWROAD 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.03	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-197	SHLL CHM 60kV	Basecase	P0	N-0	1.05	1.06	1.05	1.07	1.11	1.07	1.07	1.06	Mitigation under investigation
GBA-V-198	SHLLCHMT 60kV	Basecase	P0	N-0	1.06	1.06	1.06	1.07	1.11	1.07	1.07	1.07	Mitigation under investigation
GBA-V-199	SHREDDER 115kV	Basecase	P0	N-0	1.03	1.02	1.02	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-200	SJB DG 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-201	SJB EF 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-202	SMATEO3M 115kV	Basecase	P0	N-0	1.03	1.03	1.02	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-203	SN BRNOT 60kV	Basecase	P0	N-0	1.08	1.03	1.03	1.08	1.13	1.03	1.02	1.03	Mitigation under investigation
GBA-V-204	SN JSE A 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.03	1.02	Mitigation under investigation

Study Area: **PG&E Greater Bay Area**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-V-205	SNANDRES 60kV	Basecase	P0	N-0	1.07	1.03	1.03	1.07	1.12	1.03	1.02	1.03	Mitigation under investigation
GBA-V-206	SNTH LNE 60kV	Basecase	P0	N-0	1.08	1.03	1.03	1.08	1.13	1.03	1.02	1.03	Mitigation under investigation
GBA-V-207	SRS 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-208	SRS 115kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-209	SSS 230kV	Basecase	P0	N-0	1.01	1.01	1.01	1.02	1.05	1.01	1.02	1.02	Mitigation under investigation
GBA-V-210	STAUFFER 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.04	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-211	STELLING 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.05	1.02	1.02	1.02	Mitigation under investigation
GBA-V-212	STONE 115kV	Basecase	P0	N-0	1.01	1.01	1.00	1.04	1.08	1.02	1.03	1.02	Mitigation under investigation
GBA-V-213	SUNOL 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.02	1.02	1.01	Mitigation under investigation
GBA-V-214	SWIFT 115kV	Basecase	P0	N-0	1.02	1.02	1.01	1.04	1.08	1.03	1.04	1.03	Mitigation under investigation
GBA-V-215	TRAN230A 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.05	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-216	TRAN230B 230kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-217	TRAN-60 60kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.02	1.03	1.02	Mitigation under investigation
GBA-V-218	TRIMBLE 115kV	Basecase	P0	N-0	1.02	1.02	1.01	1.03	1.07	1.02	1.03	1.03	Mitigation under investigation
GBA-V-219	UAL COGN 115kV	Basecase	P0	N-0	1.04	1.03	1.03	1.03	1.08	1.03	1.03	1.03	Mitigation under investigation
GBA-V-220	UNIN CHM 60kV	Basecase	P0	N-0	1.03	1.03	1.03	1.05	1.07	1.03	1.04	1.04	Mitigation under investigation
GBA-V-221	Uranium 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.02	1.07	1.01	1.02	1.01	Mitigation under investigation
GBA-V-222	URICH 60kV	Basecase	P0	N-0	1.02	1.02	1.01	1.04	1.05	1.02	1.02	1.02	Mitigation under investigation
GBA-V-223	VALLECTS 60kV	Basecase	P0	N-0	1.01	1.00	1.00	1.03	1.06	1.01	1.02	1.01	Mitigation under investigation
GBA-V-224	VASCO 60kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.06	1.02	1.03	1.02	Mitigation under investigation
GBA-V-225	VASONA 230kV	Basecase	P0	N-0	1.01	1.01	1.00	1.04	1.06	1.02	1.02	1.02	Mitigation under investigation
GBA-V-226	VINEYARD 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.03	1.06	1.01	1.02	1.02	Mitigation under investigation
GBA-V-227	Walsh 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.02	1.07	1.01	1.02	1.02	Mitigation under investigation
GBA-V-228	WARNERVL 230kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.06	1.02	1.02	1.01	Mitigation under investigation
GBA-V-229	WATRSLED 60kV	Basecase	P0	N-0	1.03	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-230	WESTRN_D 115kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-231	WHISMAN 115kV	Basecase	P0	N-0	1.00	1.00	0.99	1.03	1.05	1.01	1.02	1.01	Mitigation under investigation
GBA-V-232	WLLW PSS 60kV	Basecase	P0	N-0	1.05	1.06	1.05	1.07	1.11	1.07	1.07	1.06	Mitigation under investigation
GBA-V-233	WND MSTR 230kV	Basecase	P0	N-0	1.01	1.01	1.01	1.02	1.05	1.01	1.02	1.00	Mitigation under investigation
GBA-V-234	WOLFE 115kV	Basecase	P0	N-0	1.00	1.00	1.00	1.03	1.05	1.02	1.02	1.01	Mitigation under investigation
GBA-V-235	WOODSIDE 60kV	Basecase	P0	N-0	1.01	1.01	1.01	1.04	1.07	1.02	1.02	1.02	Mitigation under investigation
GBA-V-236	WRNRVLE 115kV	Basecase	P0	N-0	1.01	1.01	1.01	1.03	1.06	1.02	1.02	1.01	Mitigation under investigation
GBA-V-237	ZANKER 115kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.07	1.03	1.03	1.03	Mitigation under investigation
GBA-V-238	Zeno 60kV	Basecase	P0	N-0	1.01	1.01	1.00	1.02	1.07	1.01	1.02	1.01	Mitigation under investigation
GBA-V-239	ZONDWD 60kV	Basecase	P0	N-0	1.02	1.02	1.02	1.04	1.06	1.03	1.03	1.03	Mitigation under investigation
GBA-V-240	EDES 115kV	BUS-TIE BREAKER FAULT AT 30550 MORAGA 230.00	P2	Bus-tie breaker	0.89	0.94	0.94	0.96	1.02	0.89	0.95	0.95	Short Term : Action Plan ; Long Term : East Shore-Oakland J 115 kV Reconductoring Project
GBA-V-241	LOCKHD 1 115kV	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	0.83	0.83	0.83	0.98	1.03	0.96	0.96	0.96	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completetd
GBA-V-242	MOFT.FLD 115kV	BUS-TIE BREAKER FAULT AT 30705 MONTAVIS 230.00	P2	Bus-tie breaker	0.83	0.83	0.84	0.98	1.03	0.96	0.96	0.96	Action Plan before Monta Vista 230 kV Bus Upgrade Project is completetd
GBA-V-243	CAROLNDS 60kV	Jefferson 230/60kV Transformer #1 & _Jefferson 230/60kV Transformer #2	P6	N-1/N-1	0.89	0.89	0.89	0.97	0.00	0.87	0.87	0.88	Review Stanford 60 kV system configuration
GBA-V-244	CRYSTLSG 60kV	Jefferson 230/60kV Transformer #1 & _Jefferson 230/60kV Transformer #2	P6	N-1/N-1	0.79	0.78	0.78	0.91	0.99	0.75	0.77	0.79	Review Stanford 60 kV system configuration
GBA-V-245	EMRLD LE 60kV	Jefferson 230/60kV Transformer #1 & _Jefferson 230/60kV Transformer #2	P6	N-1/N-1	0.79	0.79	0.79	0.91	0.99	0.76	0.77	0.79	Review Stanford 60 kV system configuration
GBA-V-246	LAS PLGS 60kV	Jefferson 230/60kV Transformer #1 & _Jefferson 230/60kV Transformer #2	P6	N-1/N-1	0.78	0.77	0.77	0.90	0.99	0.74	0.76	0.78	Review Stanford 60 kV system configuration

Study Area: **PG&E Greater Bay Area**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Summer Light Load	2017 Winter Peak	2020 Winter Peak	2025 Winter Peak	
GBA-V-247	RALSTON 60kV	Jefferson 230/60kV Transformer #1 & Jefferson 230/60kV Transformer #2	P6	N-1/N-1	0.79	0.78	0.78	0.91	0.99	0.75	0.77	0.79	Review Stanford 60 kV system configuration
GBA-V-248	STANFORD 60kV	Jefferson 230/60kV Transformer #1 & Jefferson 230/60kV Transformer #2	P6	N-1/N-1	0.74	0.74	0.74	0.88	0.96	0.71	0.72	0.74	Review Stanford 60 kV system configuration
GBA-V-249	WATRSLED 60kV	Jefferson 230/60kV Transformer #1 & Jefferson 230/60kV Transformer #2	P6	N-1/N-1	0.84	0.83	0.83	0.94	1.01	0.81	0.82	0.83	Review Stanford 60 kV system configuration
GBA-V-250	WOODSIDE 60kV	Jefferson 230/60kV Transformer #1 & Jefferson 230/60kV Transformer #2	P6	N-1/N-1	0.78	0.78	0.78	0.90	0.99	0.75	0.76	0.78	Review Stanford 60 kV system configuration
GBA-V-251	HLF MNBY 60kV	Jefferson 230/60kV Transformer #2 & Jefferson 230/60kV Transformer #1	P6	N-1/N-1	0.91	0.90	0.90	0.99	1.05	0.88	0.88	0.89	Review Stanford 60 kV system configuration
GBA-V-252	CAROLNDS 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.88	0.88	0.87	0.97	1.02	0.85	0.86	0.88	Review Stanford 60 kV system configuration
GBA-V-253	CRYSTLSG 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.77	0.77	0.76	0.91	0.98	0.73	0.75	0.77	Review Stanford 60 kV system configuration
GBA-V-254	EMRLD LE 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.77	0.77	0.77	0.91	0.98	0.74	0.75	0.77	Review Stanford 60 kV system configuration
GBA-V-255	HLF MNBY 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.89	0.89	0.89	0.99	1.03	0.86	0.87	0.88	Review Stanford 60 kV system configuration
GBA-V-256	LAS PLGS 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.76	0.76	0.76	0.90	0.98	0.72	0.74	0.76	Review Stanford 60 kV system configuration
GBA-V-257	RALSTON 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.77	0.77	0.77	0.91	0.98	0.73	0.75	0.77	Review Stanford 60 kV system configuration
GBA-V-258	STANFORD 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.72	0.72	0.72	0.88	0.95	0.68	0.70	0.72	Review Stanford 60 kV system configuration
GBA-V-259	WATRSLED 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.82	0.82	0.82	0.94	1.00	0.79	0.80	0.82	Review Stanford 60 kV system configuration
GBA-V-260	WOODSIDE 60kV	Monta Vista-Jefferson Nos. 1 & 2 230 kV lines	P7	DCTL	0.76	0.76	0.76	0.90	0.98	0.73	0.74	0.76	Review Stanford 60 kV system configuration

Study Area: **PG&E Greater Bay Area**

Transient Stability



ID	Contingency	Category	Category Description	Transient Stability Performance							Potential Mitigation Solutions
				2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	N/A	N/A	N/A	N/A	
GBA-SP-TS-1	BUS 1E FAULT30527PITSBG E 230.00	P5	Delayed fault clearing (Bus)	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles; Frequency Dip below 59.0 Hz for 6 Cycles	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles; Frequency Dip below 59.0 Hz for 6 Cycles	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles; Frequency Dip below 59.0 Hz for 6 Cycles					Reassess with actual fault clearing times and SLG fault impedances where applicable.
GBA-SP-TS-2	BUS FAULT AT 30630 NEWARK 1D 230.00	P2	Normal clearing (Bus)	Load Bus Voltage Dip> 30%	Load Bus Voltage Dip> 30%	Load Bus Voltage Dip> 30%					Reassess with actual fault clearing times and SLG fault impedances where applicable.
GBA-SP-TS-3	BUS-TIE BREAKER FAULT AT 35648 LLAGAS 115.00	P4	Stuck breaker (Non bus-tie)	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles					Reassess with actual fault clearing times and SLG fault impedances where applicable.
GBA-SP-TS-4	Pittsburg-Tesla 1 230kV Line	P5	Delayed fault clearing (Line)	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles	Load Bus Voltage Dip> 30%	Load Bus Voltage Dip> 30%					Reassess with actual fault clearing times and SLG fault impedances where applicable.
GBA-SP-TS-5	Pittsburg-San Ramon and San Ramon-Moraga 230 kV Lines	P6	Normal clearing (N-1/N-1)	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles	Load Bus Voltage Dip> 30%; Load Bus Voltage Dip 20% for 40 Cycles					Reassess with actual fault clearing times and SLG fault impedances where applicable.
GBA-SP-TS-6	Monta Vista-Jefferson Nos. 1 & 2 230 kV Lines	P7	Normal clearing (DCTL)	Load Bus Voltage Dip> 30%	Load Bus Voltage Dip> 30%	Load Bus Voltage Dip> 30%					Reassess with actual fault clearing times and SLG fault impedances where applicable.

Study Area: PG&E Greater Bay Area



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)								Potential Mitigation Solutions
				Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	
X-SP-SLD-1												

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

Study Area: **PG&E Greater Bay Area**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)								Potential Mitigation Solutions
		Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	
X-SP-SS-1	Kirker 115 kV	109	111	114	34	28	68	68	69	Loop the Kirker 115 kV substation.