Study Area: **PG&E Kern Outlying - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
KRN-O-SP-T-01	LERDO-LRDO JCT 115 kV #1 Line	MT POSO Unit ID 1	B	G-1	<100	<100	106	Monitor load growth and reconductor Kern Oil-Lerdo-7th Standard 115 kV Line if necessary
KRN-O-SP-T-02	LIVE OAK-KERN PWR 115 kV #1 Line	Kern Oil-Witco 115 kV Line	B	L-1	<100	<100	107	Monitor line loading. Rerate/reconductor. Cconvert Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system if necessary
KRN-O-SP-T-03	LRDO JCT-KERN OIL 115 kV #1 Line	MT POSO Unit ID 1 & Kern PP-Seventh Standard 115 kV Line	B	G-1/L-1	136	<100	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-04	KRN OL J-KERNWATR 115 kV #1 Line	PSE-LVOK Unit ID 1 & Kern-Live Oak 115 kV Line	B	G-1/L-1	121	121	<100	Summer operation solution setup until the Wheeler Ridge Junction Station Project is in service
KRN-O-SP-T-05	PTRL JCT-POSOMTJT 115 kV #1 Line	MT POSO Unit ID 1 & Kern Oil-Witco 115 kV Line	B	G-1/L-1	111	112	116	Convert Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-06	PTRL JCT-LIVE OAK 115 kV #1 Line	MT POSO Unit ID 1 & Kern Oil-Witco 115 kV Line	B	G-1/L-1	111	112	116	Convert Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-07	LIVE OAK-KERN PWR 115 kV #1 Line	PSE-LVOK Unit ID 1 & Kern Oil-Witco 115 kV Line	B	G-1/L-1	140	143	148	Convert Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-08	KERN PWR-KERNWATR 115 kV #1 Line	PSE-LVOK Unit ID 1 & Kern-Live Oak 115 kV Line	B	G-1/L-1	123	124	<100	Summer operation solution setup until the Wheeler Ridge Junction Station Project is in service

Study Area: **PG&E Kern Outlying - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
KRN-O-SP-T-09	LERDO-LRDO JCT 115 kV #1 Line	Kern Oil-Witco 115 kV Line & MT POSO Unit ID 1	B	L-1/G-1	102	106	110	Rerate/reconductor Kern Oil-Lerdo-7th Standard 115 kV Line if necessary
KRN-O-SP-T-10	7STNDRD-KERN PWR 115 kV #1 Line	BUS 2E FAULT AT KERN PWR 115.00	C1	BUS	144	145	<100	Summer operation solution setup until the Wheeler Ridge Junction Station Project is in service
KRN-O-SP-T-11	LRDO JCT-7STNDRD 115 kV #1 Line	BUS 2E FAULT AT KERN PWR 115.00	C1	BUS	118	118	<100	Summer operation solution setup until the Wheeler Ridge Junction Station Project is in service
KRN-O-SP-T-12	LRDO JCT-KERN OIL 115 kV #1 Line	BUS 2D FAULT AT KERN PWR 115.00	C1	BUS	<100	<100	111	Monitor faciloity loading level/load growth. Rerate/reconductor Kern Oil-Lerdo-7th Standard 115 kV Line if necessary
KRN-O-SP-T-13	KERN OIL-DSCVRYTP 115 kV #1 Line	BUS FAULT AT LIVE OAK 115.00	C1	BUS	<100	<100	108	Monitor facility loading level. Rerate/recoductor. Will benefit from the proposed conversion of the Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-14	LIVE OAK-KERN PWR 115 kV #1 Line	BUS E FAULT AT KERN OIL 115.00	C1	BUS	<100	<100	107	Monitor facility loading level. Rerate/reconductor. Will benefit from the proposed conversion of the Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-15	LRDO JCT-KERN OIL 115 kV #1 Line	BKR FAILURE KERN PP CB 262 115KV	C2	CB	<100	<100	114	Monitor facility loading/load growth and reconductor Kern Oil-Lerdo-7th Standard 115 kV Line if necessary

Study Area: **PG&E Kern Outlying - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
KRN-O-SP-T-16	KERN OIL-DSCVRYTP 115 kV #1 Line	BKR FAILURE KERN PP CB 262 115KV	C2	CB	<100	<100	116	Monitor facility loading level. Rerate/recoductor. Will benefit from the proposed conversion of the Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-17	TPMNTP1-TUPMAN 115 kV #1 Line	BKR FAILURE MIDWAY CB 392 115KV	C2	CB	118	121	129	Sectionalize Tupman 115kV sub
KRN-O-SP-T-18	KERN PWR 115/230 kV #3 Bank	BKR FAILURE KERN PP CB 102 115KV	C2	CB	<100	<100	111	Replace terminal limiting equipment to benefit from the full 420MVA transformer rating. Refer to the approved Kern PP 230kV Area Reinforcement Project.
KRN-O-SP-T-19	MIDWAY-STCKDLJ1 230 kV #1 Line	Midway-Kern #3 230 kV Line & Midway-Kern #4 230 kV Line	C3	L-1-1	103	<100	<100	Rerate/drop load in the interim. Mitigated by the approved Midway-Kern PP #1, #3 & #4 230 kV Line Project
KRN-O-SP-T-20	MIDWAY-STCKDLJ2 230 kV #1 Line	Midway-Kern #1 230 kV Line & Midway-Kern #4 230 kV Line	C3	L-1-1	135	<100	<100	Drop load in the interim. Mitigated by the approved Midway-Kern PP #1, #3 & #4 230 kV Line Project
KRN-O-SP-T-21	ARCO-TWSL J1 70 kV #1 Line	Gates-Arco 230 kV Line & Arco 230/70 kV #2 Bank	C3	T-1/L-1	97	99	102	Monitor load growth. Reconductor if necessary
KRN-O-SP-T-22	7STNDRD-KERN PWR 115 kV #1 Line	Kern Oil-Witco 115 kV Line & Live Oak-Kern Oil 115 kV Line	C3	L-1-1	112	116	<100	Summer operation solution setup/drop load until the Wheeler Ridge Junction Station Project is in service

Study Area: **PG&E Kern Outlying - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
KRN-O-SP-T-23	KERN OIL-DSCVRYTP 115 kV #1 Line	Kern PP-Seventh Standard 115 kV Line & Kern-Live Oak 115 kV Line	C3	L-1-1	106	<100	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-24	POSOMTJT-KERN OIL 115 kV #1 Line	Kern PP-Seventh Standard 115 kV Line & Kern Oil-Witco 115 kV Line	C3	L-1-1	109	<100	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-25	DSCVRYTP-GODN_BER 115 kV #1 Line	Live Oak-Kern Oil 115 kV Line & Kern PP-Seventh Standard 115 kV Line	C3	L-1-1	108	<100	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-26	DSCVRYTP-GODN_BER 115 kV #1 Line	Kern-Live Oak 115 kV Line & Live Oak 115/9.11 kV GSU Bank	C3	L-1/T-1	<100	102	109	Monitor facility loading level. Rerate/recoductor. Will benefit from the proposed conversion of the Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-27	DSCVRYTP-GODN_BER 115 kV #1 Line	Live Oak 115/9.11 kV GSU & Kern-Live Oak 115 kV Line	C3	L-1/T-1	100	102	109	Monitor facility loading level. Rerate/recoductor. Will benefit from the proposed conversion of the Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-28	KRN OL J-KERNWATR 115 kV #1 Line	Kern PP-Seventh Standard 115 kV Line & Kern-Live Oak 115 kV Line	C3	L-1-1	129	<100	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project

Study Area: **PG&E Kern Outlying - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
KRN-O-SP-T-29	KRN OL J-KERNWATR 115 kV #1 Line	Kern Oil-Dexel 115 kV Line & Kern-Live Oak 115 kV Line	C3	L-1-1	110	110	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-30	PTRL JCT-POSOMTJT 115 kV #1 Line	Kern Oil-Dexel 115 kV Line & Kern Oil-Witco 115 kV Line	C3	L-1-1	109	111	114	Drop load/summer setup/reconductor/convert Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-31	PTRL JCT-POSOMTJT 115 kV #1 Line	Kern Oil-Witco 115 kV Line & Kern PP-Seventh Standard 115 kV Line	C3	L-1-1	141	<100	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-32	PTRL JCT-LIVE OAK 115 kV #1 Line	Kern PP-Seventh Standard 115 kV Line & Kern Oil-Witco 115 kV Line	C3	L-1-1	141	<100	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-33	PTRL JCT-LIVE OAK 115 kV #1 Line	Kern Oil-Dexel 115 kV Line & Kern Oil-Witco 115 kV Line	C3	L-1-1	109	111	114	Drop load/summer setup/reconductor/convert Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-34	LIVE OAK-KERN PWR 115 kV #1 Line	Kern PP-Seventh Standard 115 kV Line & Kern Oil-Witco 115 kV Line	C3	L-1-1	169	<100	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-35	LIVE OAK-KERN PWR 115 kV #1 Line	Kern Oil-Dexel 115 kV Line & Kern Oil-Witco 115 kV Line	C3	L-1-1	121	124	130	Drop load/summer setup/reconductor/convert Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system

Study Area: **PG&E Kern Outlying - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
KRN-O-SP-T-36	KERN PWR 115/230 kV #3 Bank	Kern PP 230/115 kV #4 & #5 Bank	C3	T-1-1	149	152	106	Replace bank/congestion management/install SPS
KRN-O-SP-T-37	KERN PWR-KERNWATR 115 kV #1 Line	Westpark-Magunden 115 kV Line & (New) Magunden-Wheeler Ridge J 115 kV Line	C3	L-1-1	<100	<100	102	Monitor load growth. Drop load/rerate if necessary. Will benefit from the proposed conversion of the Semitropic-Famoso-Kern PP-Kern Oil 70 kV to 115 kV system
KRN-O-SP-T-38	KERN PWR-KERNWATR 115 kV #1 Line	Live Oak 115/9.11 kV GSU & Kern-Live Oak 115 kV Line	C3	L-1/T-1	123	124	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project
KRN-O-SP-T-39	MIDWAY-CYMRIC 115 kV #1 Line	Midway-Taft 115 kV Line & Taft-Chalk Cliff 115 kV Line	C3	L-1-1	110	111	115	Reconductor/generation dispatch/congestion management
KRN-O-SP-T-40	MIDWAY-OXYBVHTP 115 kV #1 Line	Taft-Chalk Cliff 115 kV Line & Fellows-Midsun 115 kV Line	C3	L-1-1	115	115	117	Reconductor/generation dispatch/congestion management
KRN-O-SP-T-41	MIDSUN-FELLOWSG 115 kV #1 Line	Midway-Taft 115 kV Line & Taft-Chalk Cliff 115 kV Line	C3	L-1-1	123	124	126	Reconductor/generation dispatch/congestion management
KRN-O-SP-T-42	CYMRIC-TEXCO_NM 115 kV #1 Line	Midway-Taft 115 kV Line & Taft-Chalk Cliff 115 kV Line	C3	L-1-1	112	113	115	Reconductor/generation dispatch/congestion management
KRN-O-SP-T-43	MIDSET-TAFT 115 kV #1 Line	Midway-Taft 115 kV Line & Taft-Chalk Cliff 115 kV Line	C3	L-1-1	105	106	108	Rerate/reconductor/generation dispatch/congestion management

Study Area: **PG&E Kern Outlying - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
KRN-O-SP-T-44	KERN PW2-KERN PW1 70 kV #1 Line	Kern-Old River #1 70 kV Line & Kern PP 115/70 kV #2 Bank	C3	L-1/T-1	134	138	<100	Drop load/summer setup/rerate. Mitigated by the approved Kern PP 115 kV Area Reinforcement Project

Study Area: **PG&E Kern Outlying - Summer Off-Peak & Summer Light Load**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No thermal overload concerns identified.

Study Area: **PG&E Kern Outlying - Summer Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

No voltage deviation concerns identified.

Study Area: **PG&E Kern Outlying - Summer Off-Peak & Summer Light Load**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No voltage deviation concerns identified.

Study Area: **PG&E Kern Outlying - Summer Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

No high/low voltage concerns identified.

Study Area: **PG&E Kern Outlying - Summer Off-Peak & Summer Light Load**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No high/low voltage concerns identified.

Study Area: **PG&E Kern Outlying - Summer Peak**

Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

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

Study Area: **PG&E Kern Outlying - Summer Off-Peak & Summer Light Load**

Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2016 Summer Off-Peak	2019 Summer Light Load	N/A	

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

Study Area: **PG&E Kern Outlying - Summer Peak**

Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

No single source substation with more than 100 MW Load

Study Area: **PG&E Kern Outlying - Summer Off-Peak & Summer Light Load**

Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No single source substation with more than 100 MW Load