



ID	Overloaded Facility	Worst Contingencies	Category	Category Description	Loading (%)										Potential Mitigation Solutions
					B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
T01	22227 ENCINATP 230 22716 SANLUSRY 230 1 1	P1L-23027_ 22716 SANLUSRY 230 22232 ENCINA 230 1 1	P1	N-1					126.6					107.5	Rely on operation procedure (OP) to mitigate the P6 concerns by reducing northbound flow via north of SONGS switchyard after first level contingency; develop SPS shedding generation or cost-effective solution to mitigate the P1/P4/P7 concerns by improving the transfer capability of 230 kV transmission corridor from Mission to San Luis Rey via Encina substation, including potential mitigations such as system reconfiguration, reconductor, and/or installation of power flow controller
T02		P4-06_ENCINA 230 kV 4T CB	P4	Breaker Fault/Stuck Breaker					126.5					107.8	
T03		P1L-23027_ 22716 SANLUSRY 230 22232 ENCINA 230 1 1 and P1ML-23061_ 22846 TALEGA-CAPSTRNO-ESCNDIDO 3T 230 1 1	P6	N-1-1					144.2					123.5	
T04		P1L-23057_ 22710 SANLUSRY SC 230 22504 MISSION 230 1 1 and P1L-23027_ 22716 SANLUSRY 230 22232 ENCINA 230 1 1	P6	N-1-1					141.6					121.0	
T05		P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1 and P1L-23027_ 22716 SANLUSRY 230 22232 ENCINA 230 1 1	P6	N-1-1					170.1					97.1	
T06	22716 SANLUSRY 230 22232 ENCINA 230 1 1	P1ML-23064_ 22227 ENCINA-SANLUSRY-PEN 3-T 230 1 1	P1	N-1					113.3					95.8	
T07		P1ML-23064_ 22227 ENCINA-SANLUSRY-PEN 3-T 230 1 1 and P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1	P6	N-1-1					154.5						
T08		P1L-23057_ 22710 SANLUSRY SC 230 22504 MISSION 230 1 1 and P1ML-23064_ 22227 ENCINA-SANLUSRY-PEN 3-T 230 1 1	P6	N-1-1					128.1					109.09	
T09		P1ML-23061_ 22846 TALEGA-CAPSTRNO-ESCNDIDO 3T 230 1 1 and P1ML-23064_ 22227 ENCINA-SANLUSRY-PEN 3-T 230 1 1	P6	N-1-1					127.8					109.15	
T10		P7-17_PEN-EA-SA 230KV + BQ-CC-SH-MDWLRKTP 138KV	P7	Common structure					113.3					95.8	
T11	22227 ENCINATP 230 22232 ENCINA 230 1 1	P1L-23027_ 22716 SANLUSRY 230 22232 ENCINA 230 1 1 and P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1	P6	N-1-1					133.8						
T12		P1L-23057_ 22710 SANLUSRY SC 230 22504 MISSION 230 1 1 ans P1L-23027_ 22716 SANLUSRY 230 22232 ENCINA 230 1 1	P6	N-1-1					109.0						



ID	Overloaded Facility	Worst Contingencies	Category	Category Description	Loading (%)										Potential Mitigation Solutions
					B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
T13	22716 SANLUSRY 230 24131 S.ONOFRE 230 3 1	P4-46_SANLUSRY 230 kV 1T CB	P4	Breaker Fault/Stuck Breaker					111.5						Rely on OP to mitigate the P6 concerns by reducing northbound flow via north of SONGS switchyard; develop SPS shedding generation or reconfigure the 230 kV system between San Luis Rey substation and SONGS switchyard to mitigate the P4/P7 concerns
T14		P1L-23093_ 22716 SANLUSRY 230 24131 S.ONOFRE 230 1 1 and P1L-23095_ 22716 SANLUSRY 230 24131 S.ONOFRE 230 3 1	P6	N-1-1					117.9					91.8	
T15		P7-02_SA-SO 2 + SO-SA 3 230KV	P7	Common structure					128.3					99.4	
T16	22430 SILVERGT 230 22596 OLD TOWN 230 1 1	P2.1-01_TL23028A SILVERGT-OLDTWNTP TAP A	P2	P2.1					99.1					117.1	Procure preferred resources and energy storage to approximate range of 120~160 MW in north coastal stretches from San Diego downtown; rely on operation procedure to re-dispatch generation after first level contingency, and/or implement cost-effective solution in the southern SDG&E 230 kV system, such as system reconfiguration, reconductor, and/or installation of power flow controller
T17		P1ML-23019_ 22596 MISSION-OLD TOWN-SILVERGT 3-T 230 1 1 and P1L-23033_ 22832 SYCAMORE 230 22652 PENSQTOS 230 1 1	P6	N-1-1	127.9	108.4	99.4		133.6	108.3	119.8	93.4	93.6	158.2	
T18		P1ML-23019_ 22596 MISSION-OLD TOWN-SILVERGT 3-T 230 1 1 and P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1	P6	N-1-1					126.1						
T19	22430 SILVERGT 230 22597 OLDTWNTP 230 1 1	P4-53_SILVERGATE 230 kV 2T CB	P4	Breaker Fault/Stuck Breaker	96.4				104.3		92.7			125.3	
T20		P1L-23011_ 22430 SILVERGT 230 22596 OLD TOWN 230 1 1 and P1L-23033_ 22832 SYCAMORE 230 22652 PENSQTOS 230 1 1	P6	N-1-1	126.7	106.6	97.7		133.0	106.7	118.6	91.6	91.9	157.1	
T21		P1L-23011_ 22430 SILVERGT 230 22596 OLD TOWN 230 1 1 and P1L-50003RAS1_ 23310 OCOTILLO 500 22885 SUNCREST 500 &1	P6	N-1-1	107.0	91.9				101.2	110.0				
T22		P1L-23014_ 22464 MIGUEL 230 22504 MISSION 230 1 1 and P1L-23011_ 22430 SILVERGT 230 22596 OLD TOWN 230 1 1	P6	N-1-1	106.7	90.3			117.2	95.5	102.2			139.8	
T23		P1L-23015_ 22464 MIGUEL 230 22504 MISSION 230 2 1 and P1L-23011_ 22430 SILVERGT 230 22596 OLD TOWN 230 1 1	P6	N-1-1	106.6	90.2			117.0	95.3	102.0			139.7	
T24	22430 SILVERGT 230 22771	P1L-23014_ 22464 MIGUEL 230 22504 MISSION 230 1 1 and P1L-23033_ 22832 SYCAMORE 230 22652 PENSQTOS 230 1 1	P6	N-1-1	106.5	96.1	91.7		103.1	100.8	103.0	91.7	90.9	126.8	



ID	Overloaded Facility	Worst Contingencies	Category	Category Description	Loading (%)										Potential Mitigation Solutions
					B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
T25	BAY BLVD 230 1 1	P1L-23015_ 22464 MIGUEL 230 22504 MISSION 230 2 1 and P1L-23033_ 22832 SYCAMORE 230 22652 PENSQTOS 230 1 1	P6	N-1-1	106.4	96.0	91.6		103.0	100.7	102.9	91.6	90.8	126.7	
T28	22360 IMPRLVLY 500 22361 IV BK80 MP 500 1 1	P1T-50032_ 22356 IMPRLVLY BK81 500/230 1 1 and P1T-50033_ 22356 IMPRLVLY BK82 500/230 1 1	P6	N-1-1	181.4	177.6	203.5		242.4	103.0	109.4	133.1	168.7	211.1	maintenance program to upgrade aged and non-standard IV BK80
T26	22609 OTAYMESA 230 20149 TJI-230 230 1 1	P1L-50003RAS1_ 23310 OCOTILLO 500 22885 SUNCREST 500 &1 and P1L-50001RAS2_ 22930 ECO 500 22468 MIGUEL 500 &1	P6	N-1-1	99.1	106.2					90.7		112.0	115.2	rely on OP to reduce import level via SDIT while maintaining generation support to avoid the S-line overload and adjust phase angle of IV-PST after the first level contingency;
T27		P1L-50003RAS2_ 23310 OCOTILLO 500 22885 SUNCREST 500 &1 and P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1	P6	N-1-1	101.4	108.8				96.9	98.2		108.1	114.1	
T29	22468 MIGUEL 500 22472 MIGUELMP 500 1 1	P1T-50012_ 22464 MIGUEL BK81 500/230 2 1	P1	N-1	107.5	108.8	111.9					98.3	109.8		Implement previously proposed operational mitigation that modifies existing Miguel Bank SPS to shed generation and open TL50001 as needed for the P1/P3/P6 events, along with system adjustment to reduce SDIT import and adjust phase angle of IV-PST after first level contingency while maintaining generation support avoiding the S-line overload; as an alternative to the operational mitigation of opening TL50001, procure preferred resources and energy storage to approximate range of 200~300 MW in San Diego County or upgrade Miguel 500/230 kV substation in order to reduce exposure to the loss of Southwest Powerlink
T30		P1G_OT_OTAY MESA Plant and P1T-50012_ 22464 MIGUEL BK81 500/230 2 1	P3	G-1/L-1	115.3	112.4	118.4			94.1	101.7	110.4	113.3	98.1	
T31		P1G_OT_OTAY MESA Plant and P1T-50012RAS1_ 22464 MIGUEL BK81 500/230 2 1	P3	G-1/L-1	105.1	102.0	108.6			90.7	98.2	106.9	98.1		
T32		P4-25_MIGUEL 230 kV 2T CB	P4	Breaker Fault/Stuck Breaker	106.5	107.8	111.3					97.6	109.1		
T33		P1L-50003RAS1_ 23310 OCOTILLO 500 22885 SUNCREST 500 &1 and P1T-50012_ 22464 MIGUEL BK81 500/230 2 1	P6	N-1-1	144.5	143.2	145.5			122.4	133.6	143.2	135.3	110.2	
T34		P1L-50003RAS1_ 23310 OCOTILLO 500 22885 SUNCREST 500 &1 and P1T-50012RAS2_ 22464 MIGUEL BK81 500/230 2 1	P6	N-1-1	128.3	127.0	129.4			106.6	118.0	127.2	125.2	93.4	
T35		P1T-50012_ 22464 MIGUEL BK81 500/230 2 1 and P1L-50003RAS1_ 23310 OCOTILLO 500 22885 SUNCREST 500 &1	P6	N-1-1	141.0	140.3	142.4			115.5	127.2	137.3	133.3	107.7	
T36		P1T-50012RAS1_ 22464 MIGUEL BK81 500/230 2 1 and P1L-50003RAS2_ 23310 OCOTILLO 500 22885 SUNCREST 500 &1	P6	N-1-1	122.5	121.3	123.6			99.5	111.2	121.3	120.1		



ID	Overloaded Facility	Worst Contingencies	Category	Category Description	Loading (%)										Potential Mitigation Solutions
					B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
T37	22885 SUNCREST 500 22888 SNCRSMP1 500 1 1	P1T-50022_ 22885 SUNCREST BK81 500/230 1 1 and P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1	P6	N-1-1	127.9	124.1	125.9			104.3	116.5	122.7	118.5	97.7	Develop 30-minute emergency ratings for Suncrest Bank #80/81 by upgrading bank drops, along with system adjustment to reduce SDIT import and adjust phase angle of IV-PST after first level contingency while maintaining generation support avoiding the S-line overload
T38		P1T-50022RAS1_ 22885 SUNCREST BK81 500/230 1 1 and P1L-50001RAS2_ 22930 ECO 500 22468 MIGUEL 500 &1	P6	N-1-1	113.2	107.3	109.4				101.4	108.5	107.3		
T39		P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1 and P1T-50022_ 22885 SUNCREST BK81 500/230 1 1	P6	N-1-1	136.0	133.8	134.2			112.6	126.2	132.7	127.2	102.5	
T40		P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1 and P1T-50022RAS2_ 22885 SUNCREST BK81 500/230 1 1	P6	N-1-1	123.9	121.6	121.8			99.4	112.6	120.3	120.7		
T41	P1L-23055_ 22886 SUNCREST-SYCAMORE TP2 230 2 1	P1L-23055_ 22886 SUNCREST-SYCAMORE TP2 230 2 1	P1	N-1	107.5	107.2	105.4				91.9	96.4	106.7	93.8	Implement previously proposed TL23054/23055 RAS and OP to shed generation and open TL50003 for the P1/P3/P6 events as needed, along with system adjustment to reduce SDIT import and adjust phase angle of IV-PST after first level contingency while maintaining generation support avoiding the S-line overload; as an alternative to the RAS/OP of opening TL50003, procure preferred resources and energy storage up to 500 MW in San Diego County or upgrade the 230 kV system between Suncrest and Sycamore in order to reduce exposure to the loss of Sunrise Powerlink
T42		P1G_PEN_PEN Plant and P1L-23055_ 22886 SUNCREST-SYCAMORE TP2 230 2 1	P3	G-1/L-1	114.5		112.1			94.3	101.1	105.7	109.5	103.2	
T43		P4-22_ML 7013 CB - BK 80&81	P4	Breaker Fault/Stuck Breaker	107.4	106.4	106.0					96.1	106.3		
T44		P4-23_ML 8013 CB - BK 80&TL50001	P4	Breaker Fault/Stuck Breaker	107.2	106.2	105.6				90.4	96.3	106.5		
T45		P4-56_SYCAMORE 230 kV 22T CB	P4	Breaker Fault/Stuck Breaker	109.6	109.1	106.9				94.0	98.0	108.3	96.7	
T46		P1L-23055_ 22886 SUNCREST-SYCAMORE TP2 230 2 1 and P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1	P6	N-1-1	171.3	169.1	168.4		92.1	140.5	153.9	164.7	161.0	131.6	
T47		P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1 and P1L-23055_ 22886 SUNCREST-SYCAMORE TP2 230 2 1	P6	N-1-1	184.4	182.6	182.0		94.0	152.5	167.4	180.2	171.8	137.1	
T48		P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1 and P1L-23055RAS2_ 22886 SUNCREST-SYCAMORE TP2 230 2 1	P6	N-1-1	164.5	161.8	162.0			132.9	148.0	160.4	160.3	117.9	

2017-2018 ISO Reliability Assessment - Study Results

Study Area **SDG&E Main**

Thermal Overload



ID	Overloaded Facility	Worst Contingencies	Category	Category Description	Loading (%)										Potential Mitigation Solutions
					B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
T49		SCE-P1L51_Line PALOVRDE 500 to COLRIVER 500 Ckt 1 and P1L-23055_ 22886 SUNCREST-SYCAMORE TP2 230 2 1	P6	N-1-1	120.6	109.5	107.6				102.5	99.1	109.1	96.3	
T50	22356 IMPRLVLY 230 21025 ELCENTSW 230 1 1	P1G_TDM_TDM Plant and P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1	P3	G-1/L-1	103.7	117.1				131.3	135.6	127.6	124.2		Rely on the CAISO market congestion management and operation procedure to manage the reliability of its controlled transmission grid
T51		P1L-23055RAS1_ 22886 SUNCREST-SYCAMORE TP2 230 2 1 and P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1	P6	N-1-1	120.1	133.2	99.5			101.5	106.5	97.3	173.3		
T52		P1T-50012RAS1_ 22464 MIGUEL BK81 500/230 2 1 and P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1	P6	N-1-1	120.4	133.4	99.7			102.0	107.0	97.6	173.3		
T53		P1T-50022RAS1_ 22885 SUNCREST BK81 500/230 1 1 and P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1	P6	N-1-1	121.8	135.0	101.4			103.1	108.2	99.1	174.3		
T54	24044 ELLIS 230 24072 JOHANNA 230 1 1	P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1 and SCE-P1L22_Line ELLIS 230 to SANTIAGO 230 Ckt 1	P6	N-1-1		101.7				91.6		96.1	109.1		Rely on operation procedure to turn on generation resources in the San Diego and Imperial Valley areas after first level contingency; as an alternative to the OP, procure preferred resources and energy storage up to 250 MW in San Diego and Orange Counties or upgrade the Ellis corridor by replacing terminal equipments and increasing the lines clearance if cost-effective
T55	24044 ELLIS 230 24134 SANTIAGO 230 1 1	P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1 and SCE-P1L21_Line ELLIS 230 to JOHANNA 230 Ckt 1	P6	N-1-1		100.9				103.3		107.1	106.4		
T56		P1L-50001RAS1_ 22930 ECO 500 22468 MIGUEL 500 &1 and SCE-P1L21_Line ELLIS 230 to JOHANNA 230 Ckt 1	P6	N-1-1		107.3				95.6		100.7	115.4		
T57		SCE-P1L21_Line ELLIS 230 to JOHANNA 230 Ckt 1 and P1L-50002_ 22536 N.GILA 500 22360 IMPRLVLY 500 &1	P6	N-1-1		101.1				103.6		107.4	106.8		



ID	Substation	Worst Contingencies	Category	Category Description	Voltage (PU)										Potential Mitigation Solutions
					B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
V-01	SANLUSRY SC 230 kV	P1L-23028_ 22716 SANLUSRY 230 22710 SANLUSRY SC 230 1 1 and P1L-23029_ 22716 SANLUSRY 230 22710 SANLUSRY SC 230 2 1	P6	N-1-1	1.1244	1.1245	1.1267		1.1273	1.117	1.1231	1.1104	1.121	1.1181	Check San Luis Rey SCs' bus voltage regulation and avoid regulating remote bus voltage
V-02	SANLUSRY SC 230 kV	P1L-23029_ 22716 SANLUSRY 230 22710 SANLUSRY SC 230 2 1 and P1L-23028_ 22716 SANLUSRY 230 22710 SANLUSRY SC 230 1 1	P6	N-1-1	1.1244	1.1245	1.1267		1.1273	1.117	1.1231	1.1104	1.121	1.1181	



ID	Substation	Worst Contingencies	Category	Category Description	Post Cont. Voltage Deviation %										Potential Mitigation Solutions
					B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	



ID	Contingency	Category	Category Description	Transient Stability Performance										Potential Mitigation Solutions
				B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
TS-01	3Ø fault at ECO-Miguel 500 kV line (TL50001) outage with normal clearing	P1	N-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-02	3Ø fault at Ocotillo-Suncrest 500 kV line (TI50003) outage with normal clearing	P1	N-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-03	SLG fault at Miguel 230 kV bus section with normal clearing	P2	internal breaker fault	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-04	TDM Power Plant out of service by system adjustment, and then a subsequent second 3Ø fault at N.Gila-IV 500 kV line with normal clearing	P3	G-1/L-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-05	Otay Mesa Energy Center out of service by system adjustment, and then a subsequent second 3Ø fault at N.Gila-IV 500 kV line with normal clearing	P3	G-1/L-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-06	SLG fault at Miguel 230 kV bus section with loss of multiple elements caused by a stuck breaker on attempting to clear the fault	P4	stuck breaker	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-07	SLG fault at Miguel 500 kV bus section with loss of multiple elements caused by a stuck breaker on CB7013 attempting to clear the fault	P4	stuck breaker	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-08	ECO-Miguel 500 kV outage followed by system adjustment, and then a subsequent second 3Ø fault at Ocotillo-Suncrest 500 kV line with normal clearing	P6	N-1-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-09	Ocotillo-Suncrest 500 kV outage followed by system adjustment, and then a subsequent second 3Ø fault at ECO-Miguel 500 kV line with normal clearing	P6	N-1-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	



ID	Contingency	Category	Category Description	Transient Stability Performance										Potential Mitigation Solutions
				B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
TS-10	Ocotillo-Suncrest 500 kV outage by system adjustment, and then a subsequent second 3Ø fault at Miguel BK80 with normal clearing	P6	N-1-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-11	ECO-Miguel 500 kV line outage followed by system adjustment, and then a subsequent second 3Ø fault at Ellis-Johanna 230 kV line with normal clearing	P6	N-1-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	
TS-12	N.Gila-IV 500 kV line outage followed by system adjustment, and then a subsequent second 3Ø fault at Ellis-Johanna 230 kV line with normal clearing	P6	N-1-1	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	

Single Contingency Load Drop

ID	Worst Contingencies	Category	Category Description	Amount of Load Drop (MW)										Potential Mitigation Solutions
				B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off-Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
X-SLD-1														

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

Study Area: **SDG&E Main**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)										Potential Mitigation Solutions
		B1: 2019 Summer Peak	B2: 2022 Summer Peak	B3: 2027 Summer Peak	B4: 2019 Spring Light Load	B5: 2022 Spring Off- Peak	S1: 22SP High Load & Peak Shift	S2: 19SP Peak Shift	S3: 27SP Peak Shift	S4:22SP High Renewables Output	S5: 22SP Heavy Northbound Flow	
X-SS-1												

No single source substation with more than 100 MW Load