

#	CONTINGENCY	Contingency Type	Affected Facility	Adverse Result (e.g., voltage collapse, thermal overload)	Without Mesa Substation Project (Thermal Loading (% of Emergency rating) or Voltage (p.u.))	Proposed Project (Thermal Loading (% of Emergency Rating) or Voltage (p.u.))	Potential No Action Remedial Action Scheme (Thermal Loading (% of Emergency rating) or Voltage (p.u.))	One 1600-MVA Transformer Alternative (Thermal Loading (% of Emergency rating) or Voltage (p.u.))	Two 1120-MVA Transformer Alternative (Thermal Loading (% of Emergency rating) or Voltage (p.u.))
1	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by Huntington Beach CCGT outage (HUNTX1,X2,&X3)	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	114%	79%	0% (3)	89%	83%
2	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by Huntington Beach CCGT outage (HUNTX1,X2,&X3)	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	114%	79%	0% (3)	89%	83%
3	LUGO to RANCVST 500 kV No.1 Transmission Line outage followed by MIRALOMA to SERRANO 500 kV No.2 Transmission Line outage	N-1-1	MIRA LOMA 500 kV No. 4 Transformer Bank	Thermal overload	113%	86%	101% (1&2)	94%	59%
4	SERRANO 230 kV to VILLA PK 230 kV No. 2 Transmission Line outage followed by LEWIS 230 kV to SERRANO 230 kV No. 1 Transmission Line outage	N-1-1	SERRANO to VILLAPK 230kV No. 1 Transmission Line	Thermal overload	113%	91%	61% (1)	98%	93%
5	SERRANO 230 kV to VILLA PK 230 kV No. 2 Transmission Line outage followed by LEWIS 230 kV to SERRANO 230 kV No. 2 Transmission Line outage	N-1-1	SERRANO to VILLAPK 230kV No. 1 Transmission Line	Thermal overload	113%	91%	52% (1)	98%	93%
6	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by Alamitos CCGT outage (ALAMTX1,X2,&X3)	N-2	BARRE to LEWIS 230kV Transmission Line	Thermal overload	112%	77%	0% (3)	86%	81%
7	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by Alamitos CCGT outage (ALAMTX1,X2,&X3)	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	112%	76%	0% (3)	86%	80%
8	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by N.GILA 500 kV to IMPRLVLY 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	107%	72%	0% (3)	86%	77%
9	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by N.GILA 500 kV to IMPRLVLY 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	107%	71%	0% (3)	86%	76%
10	CHINO 230 kV to MIRALOMW 230 kV No. 1 Transmission Line outage followed by CHINO 230 kV to MIRALOMW 230 kV No. 2 Transmission Line outage	N-1-1	CHINO to MIRALOME 230 kV No.3 Transmission Line	Thermal overload	107%	99%	79% (1&2)	92% (1)	92% (1)
11	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by MIRALOME 230 kV to OLINDA 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	107%	67%	0% (3)	52%	72%
12	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by MIRALOME 230 kV to OLINDA 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	106%	67%	0% (3)	52%	72%
13	SERRANO 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by LEWIS 230 kV to SERRANO 230 kV No. 1 Transmission Line outage	N-1-1	SERRANO to VILLAPK 230kV No. 2 Transmission Line	Thermal overload	106%	85%	49% (1)	92%	88%
14	SERRANO 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by LEWIS 230 kV to SERRANO 230 kV No. 2 Transmission Line outage	N-1-1	SERRANO to VILLAPK 230kV No. 2 Transmission Line	Thermal overload	106%	85%	49% (1)	92%	88%
15	CHINO 230 kV to MIRALOME 230 kV No. 3 Transmission Line outage followed by MIRALOMA 500 kV No. 2 Transformer Bank outage	N-1-1	MIRA LOMA 500 kV No. 1 Transformer Bank	Thermal overload	106%	88%	99% (2)	94%	90%
16	SERRANO 500 kV No.1 Transformer Bank outage followed by N.GILA to IMPRLVLY 500 kV No.1 Transmission Line outage	N-1-1	SERRANO 500 kV No. 2 Transformer Bank	Thermal overload	105%	88%	71% (1)	93%	90%
17	MIRALOME to OLINDA 230 kV No.1 Transmission Line outage followed by MIRALOMA 500 kV No.1 Transformer Bank outage	N-1-1	CHINO to MIRALOME 230 kV No.3 Transmission Line	Thermal overload	105%	90%	96% (2)	95%	92%
18	CHINO 230 kV to MIRALOME 230 kV No. 3 Transmission Line outage followed by MIRALOMA 500 kV No. 1 Transformer Bank outage	N-1-1	MIRA LOMA 500 kV No. 2 Transformer Bank	Thermal overload	105%	87%	98% (2)	93%	89%
19	MIRALOME to OLINDA 230 kV No.1 Transmission Line outage followed by MIRALOMA 500 kV No.2 Transformer Bank outage	N-1-1	CHINO to MIRALOME 230 kV No.3 Transmission Line	Thermal overload	105%	89%	95% (2)	94%	92%
20	SYLMAR 230 kV No.2 Transformer Bank outage followed by SYLMAR 230 kV No.3 Transformer Bank outage	N-2	SYLMAR 230 kV No.1 Transformer Bank	Thermal overload	104%	70%	0% (4)	81%	75%
21	SYLMAR 230 kV No.1 Transformer Bank outage followed by SYLMAR 230 kV No.3 Transformer Bank outage	N-2	SYLMAR 230 kV No.2 Transformer Bank	Thermal overload	104%	70%	0% (4)	81%	75%
22	SERRANO 500 kV No.3 Transformer Bank outage followed by N.GILA to IMPRLVLY 500 kV No.1 Transmission Line outage	N-1-1	SERRANO 500 kV No. 2 Transformer Bank	Thermal overload	104%	87%	71% (1)	92%	89%
23	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by IMPRLVLY 500 kV to ECO 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	104%	70%	0% (3)	80%	75%
24	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by S.ONOFRE 230 kV to SANTIAGO 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	104%	69%	0% (3)	80%	73%
25	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by S.ONOFRE 230 kV to SANTIAGO 230 kV No. 2 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	104%	69%	0% (3)	80%	73%
26	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by ECO 500 kV to MIGUEL 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	104%	70%	0% (3)	80%	74%
27	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by IMPRLVLY 500 kV to ECO 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	104%	69%	0% (3)	80%	74%
28	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by S.ONOFRE 230 kV to SANTIAGO 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	104%	69%	0% (3)	80%	73%
29	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by S.ONOFRE 230 kV to SANTIAGO 230 kV No. 2 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	104%	69%	0% (3)	80%	73%
30	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by ECO 500 kV to MIGUEL 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	104%	69%	0% (3)	80%	74%
31	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by GOODRICH 230 kV to GOULD 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	104%	64%	0% (3)	75%	69%
32	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by GOODRICH 230 kV to GOULD 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	103%	64%	0% (3)	75%	68%
33	MIRALOMA 500 kV No.2 Transformer Bank outage followed by MIRALOMA to SERRANO 500 kV No.2 Transmission Line outage	N-1-1	MIRA LOMA 500 kV No.1 Transformer Bank	Thermal overload	103%	79%	95% (1&2)	87%	82%
34	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by MIRALOMW 230 kV to WALNUT 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	103%	65%	0% (3)	76%	70%
35	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by MIRALOMW 230 kV to WALNUT 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	103%	65%	0% (3)	76%	70%
36	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by VINCNT2 230 kV to MESA CAL 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	103%	65%	0% (3)	77%	70%
37	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by MESA CAL 230 kV to VINCNT2 230 kV No. 2 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	103%	65%	0% (3)	77%	70%
38	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by VINCENT 230 kV to RIOHONDO 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	103%	65%	0% (3)	76%	70%
39	SERRANO 500 kV No.2 Transformer Bank outage followed by N.GILA to IMPRLVLY 500.0 No.1 Transmission Line outage	N-1-1	SERRANO 500 kV No. 1 Transformer Bank	Thermal overload	103%	86%	70% (1)	91%	87%
40	SERRANO 230 kV to VILLA PK 230 kV No. 2 Transmission Line outage followed by Huntington Beach CCGT outage (HUNTX1,X2,&X3)	N-1-1	SERRANO to VILLAPK 230kV No. 1 Transmission Line	Thermal overload	102%	84%	0% (3)	90%	86%
41	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by VINCNT2 230 kV to MESA CAL 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	65%	0% (3)	79%	69%
42	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by VINCENT 230 kV to RIOHONDO 230 kV No. 2 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	102%	65%	0% (3)	76%	70%
43	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by OCOTILLO 500 kV to SUNCREST 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	102%	69%	0% (3)	79%	73%
44	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by IMPRLVLY 500 kV to OCOTILLO 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	102%	69%	0% (3)	79%	73%
45	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by MESA CAL 230 kV to VINCNT2 230 kV No. 2 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	65%	0% (3)	76%	69%
46	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by SYLMAR S 230 kV to GOULD 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	102%	65%	0% (3)	76%	70%
47	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by LITEHIPE 230 kV to MESA CAL 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	102%	70%	0% (3)	79%	74%

Remdial Action Scheme Notes:

- (1) Open Lewis-Barre 220-kV and Villa Park-Barre 220-kV Circuits
- (2) Drop Load at Mission Viejo Substation
- (3) Open the circuit which has been overloaded by this contingency
- (4) Bypass the overloaded transformer

#	CONTINGENCY	Contingency Type	Affected Facility	Adverse Result (e.g., voltage collapse, thermal overload)	Without Mesa Substation Project (Thermal Loading (% of Emergency rating) or Voltage (p.u.))	Proposed Project (Thermal Loading (% of Emergency Rating) or Voltage (p.u.))	Potential No Action Remedial Action Scheme (Thermal Loading (% of Emergency rating) or Voltage (p.u.))	One 1600-MVA Transformer Alternative (Thermal Loading (% of Emergency rating) or Voltage (p.u.))	Two 1120-MVA Transformer Alternative (Thermal Loading (% of Emergency rating) or Voltage (p.u.))
48	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by LITEHIPE 230 kV to MESA CAL 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	70%	0% (3)	79%	73%
49	MIRALOMA 500 kV No.1 Transformer Bank outage followed by MIRALOMA to SERRANO 500 kV No.2 Transmission Line outage	N-1-1	MIRA LOMA 500 kV No.2 Tranformer Bank	Thermal overload	102%	78%	100%(1), 96%(2)	86%	81%
50	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by EAGLROCK 230 kV to SYLMAR S 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	102%	65%	0% (3)	77%	70%
51	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by S.ONOFRE 230 kV to SERRANO 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	68%	0% (3)	79%	72%
52	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by VINCENT 230 kV to RIOHONDO 230 kV No. 2 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	64%	0% (3)	76%	69%
53	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by CENTER S 230 kV to OLINDA 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	65%	0% (3)	77%	70%
54	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by OCOTILLO 500 kV to SUNCREST 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	68%	0% (3)	78%	72%
55	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by VINCENT 230 kV to RIOHONDO 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	64%	0% (3)	76%	69%
56	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by IMPRLVLY 500 kV to OCOTILLO 500 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	68%	0% (3)	78%	72%
57	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by SYLMAR S 230 kV to GOULD 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	102%	65%	0% (3)	76%	69%
58	MESA CAL 230 kV to VINCNT2 230 kV No. 2 Transmission Line outage followed by VINCENT 500 kV No. 2 Transformer Bank outage	N-1-1	VINCENT 500 kV No. 3 Transformer Bank	Thermal overload	102%	66%	99% (2)	76%	70%
59	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by CENTER S 230 kV to OLINDA 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	102%	66%	0% (3)	77%	70%
60	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by EAGLROCK 230 kV to SYLMAR S 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	101%	65%	99% (2)	76%	70%
61	VINCENT to MESA 230 kV No.1 Transmission Line outage followed by VINCENT 500 kV No.1 Transformer Bank outage	N-1-1	VINCENT 500 kV No. 3 Transformer Bank	See note 1					
62	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by S.ONOFRE 230 kV to SERRANO 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	101%	68%	98% (2)	78%	72%
63	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by SERRANO 230 kV to VILLA PK 230 kV No. 2 Transmission Line outage	N-1-1	SERRANO to VILLAPK 230kV No. 1 Transmission Line	Thermal overload	101%	80%	44% (1)	68%	62%
64	SERRANO 230 kV to VILLA PK 230 kV No. 2 Transmission Line outage followed by Alamitos CCGT outage (ALAMTX1,X2,&X3)	N-1-1	SERRANO to VILLAPK 230kV No. 1 Transmission Line	Thermal overload	101%	83%	44% (1)	88%	80%
65	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by VIEJOSC 230 kV to CHINO 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	101%	67%	97% (2)	78%	72%
66	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by VIEJOSC 230 kV to CHINO 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	101%	67%	96% (2)	77%	71%
67	SERRANO 500 kV No.1 Transformer Bank outage followed by IMPRLVLY ECO 500 kV No.1 Transmission Line outage	N-1-1	SERRANO 500 kV No. 2 Transformer Bank	Thermal overload	101%	84%	68% (1)	89%	86%
68	SERRANO 500 kV No. 1 Transformer Bank outage followed by ECO 500 kV to MIGUEL 500 kV No. 1 Transmission Line outage	N-1-1	SERRANO 500 kV No. 2 Transformer Bank	Thermal overload	101%	84%	68% (1)	89%	86%
69	SERRANO 500 kV No.3 Transformer Bank outage followed by N.GILA to IMPRLVLY 500 kV No.1 Transmission Line outage (Same as #22)	N-1-1	SERRANO 500 kV No. 1 Transformer Bank	Thermal overload	101%	84%	68% (1)	89%	86%
70	SERRANO 500 kV No.2 Transformer Bank outage followed by N.GILA to IMPRLVLY 500.0 No.1 Transmission Line outage (Same as #39)	N-1-1	SERRANO 500 kV No. 3 Transformer Bank	Thermal overload	101%	84%	70% (1)	89%	87%
71	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by ELSEGND0 230 kV to ELSEG78 230 kV No. 2 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	101%	66%	99% (2)	77%	71%
72	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by El Segundo 7 8 MODULE (ELSEG7GT &ELSEG8ST) outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	101%	66%	99% (2)	77%	71%
73	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by El Segundo 5 6 MODULE (ELSEG5GT &ELSEG6ST) outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	101%	66%	99% (2)	77%	71%
74	BARRE 230 kV to VILLA PK 230 kV No. 1 Transmission Line outage followed by ELSEGND0 230 kV to ELSEG56 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to LEWIS 230kV Transmission Line	Thermal overload	101%	66%	99% (2)	77%	71%
75	VINCENT 500 kV No. 2 Transformer Bank outage followed by Alamitos CCGT outage (ALAMTX1,X2,&X3)	N-1-1	VINCENT 500 kV No. 3 Transformer Bank	Thermal overload	100%	69%	99% (2)	78%	72%
76	MIRALOMA 500 kV No.2 Transformer Bank outage followed by MIRALOMA 500 kV No.4 Transformer Bank outage	N-1-1	MIRA LOMA 500 kV No.1 Tranformer Bank	Thermal overload	100%	80%	95% (2)	86%	82%
77	SERRANO 500 kV No.3 Transformer Bank outage followed by IMPRLVLY to ECO 500 kV No.1 Transmission Line outage	N-1-1	SERRANO 500 kV No. 2 Transformer Bank	Thermal overload	100%	84%	67% (1)	89%	85%
78	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by ELSEGND0 230 kV to ELSEG78 230 kV No. 2 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	100%	66%	99% (2)	76%	70%
79	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by El Segundo 7 8 MODULE (ELSEG7GT &ELSEG8ST) outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	100%	66%	99% (2)	76%	70%
80	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by ELSEGND0 230 kV to ELSEG56 230 kV No. 1 Transmission Line outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	100%	66%	99% (2)	76%	70%
81	BARRE 230 kV to LEWIS 230 kV No. 1 Transmission Line outage followed by El Segundo 5 6 (ELSEG5GT &ELSEG6ST) MODULE outage	N-1-1	BARRE to VILLAPK 230kV Transmission Line	Thermal overload	100%	66%	99% (2)	76%	70%
82	SERRANO 230 kV No. 3 Transformer Bank outage followed by ECO 500 kV to MIGUEL 500 kV No. 1 Transmission Line outage	N-1-1	SERRANO 500 kV No. 2 Transformer Bank	Thermal overload	100%	83%	67% (1)	89%	85%
83	SERRANO 500 kV No. 1 Transformer Bank outage followed by Huntington Beach CCGT outage (HUNTX1,X2,&X3)	N-1-1	SERRANO 500 kV No. 2 Transformer Bank	Thermal overload	100%	83%	67% (1)	88%	85%
84	Base Case	N-0	GOODRICH 230 kV Bus	Low Voltage	0.946	0.963	0.951 (5)**	0.954**	0.963**
85	Base Case	N-0	GOULD 230 kV Bus	Low Voltage	0.949	0.967	0.952**	0.963**	0.967**
86	Base Case	N-0	RIOHONDO 230 kV Bus	Low Voltage	0.949	0.963	0.951**	0.956**	0.961**
87	ECO 500 kV to MIGUEL 500 kV No. 1 Transmission Line outage followed by OCOTILLO 500 kV to SUNCREST 500 kV No. 1 Transmission Line outage	N-1-1	SERRANO 230 kV Bus	Low Voltage*	0.893	0.921	0.915***	0.926***	0.927***
88	ECO 500 kV to MIGUEL 500 kV No. 1 Transmission Line outage followed by OCOTILLO 500 kV to SUNCREST 500 kV No. 1 Transmission Line outage	N-1-1	VILLAPK 230 kV Bus	Low Voltage*	0.895	0.923	0.917***	0.928***	0.930***
89	ECO 500 kV to MIGUEL 500 kV No. 1 Transmission Line outage followed by OCOTILLO 500 kV to SUNCREST 500 kV No. 1 Transmission Line outage	N-1-1	LEWIS 230 kV Bus	Low Voltage*	0.896	0.923	0.918***	0.929***	0.930***
90	ECO 500 kV to MIGUEL 500 kV No. 1 Transmission Line outage followed by OCOTILLO 500 kV to SUNCREST 500 kV No. 1 Transmission Line outage	N-1-1	RIOHONDO 230 kV Bus	Low Voltage*	0.898	0.944	0.928***	0.944***	0.947***

*Voltage Collapse

** Minimum 0.95 pu during normal conditions

*** Minimum 0.90 pu during outages

Remdial Action Scheme Notes:

- (1) Open Lewis-Barre 220-kV and Villa Park-Barre 220-kV Circuits
- (2) Drop Load at Mission Viejo Substation
- (3) Open the circuit which has been overloaded by this contingency
- (5) Add 30 MVAR capacitors at Goodrich Substation

Notes:

- 1.) Vincent-Mesa 230-kV line not found in powerflow case data. Adjacent lines were studied, but no overloads were found.